Chapter 3 – Existing and Future Conditions

407 TRANSITWAY – WEST OF BRANT STREET TO WEST OF HURONTARIO STREET

MINISTRY OF TRANSPORTATION - CENTRAL REGION

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3. EXISTING AND FUTURE CONDITIONS

This section describes the existing and future conditions (without the implementation of the 407 Transitway) found within the study area. This 43 km segment forms part of the 150 km long high-speed interregional facility planned to be ultimately constructed on a separate right-of-way that parallels Highway 407 ETR from the City of Burlington to Peel Region, with stations, parking, and access connections. The description of the existing and future conditions provided a baseline for the generation of alternatives, assessment of environmental impacts and the identification of environmental protection measures and monitoring plans. The identification of the environmental features (i.e. transportation infrastructure, natural, social and cultural environment) involved collection of primary and secondary source data including consultation with technical agencies. This was done in two steps, an inventory and analysis of existing conditions and an investigation as to how these conditions might change in the future. In general, the existing and future conditions can be categorized into the following topics and are presented in the associated sections:

- Natural Environment;
- Socio-Economic and Cultural Environment;
- Transportation; and,
- Utilities.

3.1. Natural Environmental

3.1.1. Physiography and Soils

According to Chapman and Putnam (1984), the study area is located within the South Slope, Peel Plain and Niagara Escarpment physiographic regions. The majority of the study area is located within the Peel Plan physiographic region, which extends from Hurontario Street in the east to approximately Britannia Road in the west. All of the lands in the study area between Britannia Road and Walkers Line are classified as South Slope. The last portion of the study area, between Walkers Line and Brant Street, are located within the Niagara Escarpment physiographic region.

Both the Peel Plain and South Slope extend through the Region of Peel and Halton. The Peel Plain is a level to undulating tract of clay soils (Chapman and Putnam 1984). Across the plain, watercourses have cut deep valleys and as such, there is no large undrained depression, swamp or bog in the whole area, although in many of the interstream areas drainage is imperfect (Chapman and Putnam 1984). The South Slope physiographic region is the southern slope of the Oak Ridges Moraine. In the vicinity of the study area, the surface is morainic, consisting of a ground moraine with limited relief (Chapman and Putnam 1984). The Niagara Escarpment physiographic region displays a terrain not found elsewhere in Southern Ontario. The vertical cliffs along the brow mark the edge of the Silurian dolomite formations while the slopes below are carved in red shale (Chapman and Putnam 1984).

Regional Geology

Based on the geology mapping, the majority of the Transitway crosses fine-textured Halton till, predominantly consisting of deposits of silt to silty clay. Based on the MECP Well Records, water wells have been in use historically throughout the study area and given the undeveloped nature of portions of the western limits of the study area, water wells may continue to be in use within the study area. The geology reported in the well records is generally consistent with the published mapping with relatively fine-grained clay and silt deposits typically reported at ground surface. Bedrock (described as shale) was reported at a depth of 1 m below grade in the western portion of the study area, extending to 13.4 m below grade further east and up to 20 m below grade near Highway 407 and Highway 403.

3.1.2. Contaminated Properties and Waste

Based on the existing land use information obtained from the information collected to date, there are some properties within the study area that would require further environmental investigation to assess the potential presence of subsurface impacts. The Contamination Overview Study (Golder 2019) prepared for the TPAP provides further information on contaminated properties which may have environmental impacts to soil and/or groundwater (see **Appendix M** of this EPR).

In general, properties currently developed as service garages, gas stations, vehicle sales centres, auto body repair shops, manufacturing facilities, industrial properties, waste management facilities and construction yards represent issues of potential environmental concern and impacts may be encountered during construction activities in the vicinity of these properties. Properties which require further background investigation generally include properties that appear to be vacant or newly occupied, but which had previously been developed for different uses. Agricultural properties with active farming infrastructure (i.e. barns, sheds, livestock pens) within the study area have been identified due to the potential petroleum hydrocarbon, pesticide, and nutrients impacts associated with these operations; however, cultivated fields have not been identified.

The issues of potential environmental concern identified are preliminary in nature and may not include all issues associated with the property. Additional background information (i.e. an EcoLog ERIS database search) is required to better characterize the potential site-specific contaminants of concern. Should impacts be identified during subsequent phases of work, which are not anticipated based on the evaluation completed, an assessment will be conducted, and appropriate steps will be taken following the MTO's Environmental Reference for Highway Design.

The following is a breakdown of recommended additional environmental assessment programs based on information obtained to date.

- Priority Level 1: Properties are anticipated to have subsurface impacts. Additional investigations are recommended should they be included in the study area in the future;

- Priority Level 2: Properties require further assessment to determine whether subsurface investigations would be warranted (i.e., a Phase I ESA is recommended); and,

- Priority Level 3: Properties will require subsurface environmental investigation to determine whether soil and/or groundwater impacts exist at the properties.

3.1.3. Drainage

The Project area has very distinct physiographic regions that will require different drainage and stormwater management strategies to minimize any potential impacts. Eight regions have been identified to illustrate how the preliminary design objectives can be met. These regions have been defined by the regional or municipal roads closest to those physiographic areas proceeding from the Brant Street to Hurontario Street. These eight regions are described further below.

Brant Street to Guelph Line: North/South

This segment is the most constrained area within the project limits. A narrow highway corridor fringed by residential developments to both the east and the west leads to a competition for land use. There is an existing storm trunk running along the west side of 407 ETR corridor from south of Guelph Line to North Service Road diverting excessive flow from Rambo Creek and providing drainage outlet to the upstream residential stormwater drainage system. This storm trunk is interconnected with many municipal drains adjacent to the corridor while servicing the 407 ETR Right-of-Way area through catchbasins in the road ditch. The opportunity for storage facilities in this area is limited and flooding risk is high due to surcharged underground pipes and low highway road surface grades.

Guelph Line to Appleby Line: North/South

This area is characterized by the escarpment to the northwest and residential development to the south. There are number of creeks in this area; namely, Sheldon Creek, Appleby Creek and Tuck Creek. Nine major watercourses need to be analyzed for potential impacts, of which three watercourses within Tuck Creek tributary are underground pipes connecting to municipal drains. There are also three existing stormwater management facilities located in the area, with the potential for retrofitting these facilities in combination with LIDs will be considered. Given that the corridor is generally wide, several different stormwater management strategies and practices can be explored for this area, in addition to the use of LIDs.

Appleby Line to Bronte Road (Regional Road 25): Northeast/Southwest

This area is characterized by agricultural lands and woodlots on both sides of the corridor. The topography is generally flat, except where the highway enters the Bronte Creek valley system. There are two existing SWM facilities and approximately twelve watercourses that convey flows from north to south that will need to be evaluated as part of the study for extension or adverse impacts associated with the transitway. The main watercourse is the Bronte Creek where the river valley is well defined and sufficient floodplain storage is available.

Bronte Road (Regional Road 25) to Sixth Line: North/South

This area is characterized by the Sixteen Mile Creek valley that runs parallel (northwest) of the corridor and agricultural lands to the southeast, with very little development on either side of the existing 407 ETR. Drainage is generally southwesterly along the 407 ETR to the Sixteen Mile Creek bridge crossing. Five stormwater management ponds are located within this segment to provide flow control for the 407 ETR runoff.

Sixth Line to Highway 403: Northeast/Southwest

This area mainly consists of agricultural lands and relatively few woodlots. The project site is located within the small headwater tributaries of Joshua's and Morrison Creeks. Drainage in this area is generally along the existing 407 ETR corridor conveyed in grass-lined ditches to six existing water crossings and three ponds within the 407 Corridor.

Highway 403 to Highway 401: Northwest/Southeast

This segment is aligned northwest to southeast, with agricultural lands to the west and residential development to the east. Drainage generally flows southeasterly in 407 ETR drainage channel on the east site of highway towards the Sixteen Mile Creek tributary crossing. There are four existing ponds and four watercourse crossings within the project limits. Starting just north of Britannia Road and extending 1.5 kilometers, three tributaries of the Sixteen Mile Creek flank the corridor and could potentially present the biggest challenge to the transitway alignment in this area. There are a number of drains from the City of Mississauga connecting to the watercourse along the northeast side of the corridor, west of Ninth Line, which feed into the online storage area. An existing floodplain hydraulic assessment has been done to evaluate the impacts of future growth and development of Ninth Line Lands and Transitway alignment options in 2017.

Highway 401 to Hurontario Street: Northeast/Southwest

This segment is characterized by a relatively flat topography, with agricultural lands to the north and development to the south, including the 401 Corridor which runs parallel to the mainline. There are four existing stormwater management ponds—three of which are sandwiched between the two highways—that present retrofit opportunities given the available buffer space. The feasibility to use these ponds will depend on the Preferred Alignment for the transitway and the ability to direct its drainage to these facilities. There are four major culvert crossings in this segment on tributaries to the Sixteen Mile Creek that flow southeasterly across the alignment. These water crossings will need to be evaluated, along with the need for extensions and any potential adverse impacts due to the transitway. The option of utilizing these existing drainage facilities will be explored in conjunction with the use of LIDs and Enhanced grassed swales to supplement existing measures.

407 ETR Crossings

Given the proximity of the project site to the existing 407 ETR, the existing hydraulic condition of watercourse crossings affects the design of proposed Transitway project. A desktop review of the existing

crossing structures was completed based on record drawings obtained from 407 ETR office. Key information such as upstream and downstream invert elevations, structure sizes and materials are summarized in the Drainage and Stormwater Management Report (Parsons 2019), **Appendix C** of this EPR.

Some 407 ETR crossings around the Ninth Line and 407/401 Interchange area are more than 200 m away from the 407 Transitway project limits and are not expected to affect the proposed Transitway. Majority of the crossings are located on regulated watercourses. Floodplain has been delineated on some regulated watercourses around the project site. Watercourses on Burlington Urban Creeks, Oakville East Urban Creeks, and Sixteen Mile Creek watersheds are designated as warm water habitats, while watercourses on Oakville West Urban Creeks and Sixteen Mile Creek watersheds are designated as potential cold or cool water habitat. Majority of the watercourses in CH are not directly related to fish habitat except for watercourses on Shoreacres Creek, Bronte Creek, and Sixteen Mile Creek. All crossings within the jurisdiction of Credit Valley Conservation Authority are directly related to fish habitat. Notably, species at risk (SAR) have been found on watercourses Bronte Creek, Sixteen Mile Creek, and Fletcher's Creek.

Municipal drains are present at the west end of the project site, through which creeks and stormwater runoff from upstream urban areas were carried under the existing 407 ETR. The invert information extracted from the drawings represents the approximate pipe invert elevation at the 407 ETR centreline. The pipe obvert elevation within the TWY 4 corridor needs to be further refined through additional ground survey at later stages to ensure the final design provides sufficient cover and protection to the existing underground pipes. The inlet and outlet conditions indicate the connectivity of 407 ETR's corridor drainage system to the Municipal Drains.

Notably, N01 is a large concrete storm trunk designed for Rambo-Hager creek diversion. It starts from south of Upper Middle Road collecting road runoff from 407 ETR and runs to the south parallel to ETR while intercepting stormwater drainage from adjacent residential areas. The outlet is located north of North Service Road where it crosses the ETR and drains into the Hager Creek. The length of this storm trunk was not extracted as the pipe length does not represent the length of crossing structure. Majority of the Municipal Drains collect and convey runoff from 407 ETR, indicating an outlet liability assessment is needed if Municipal Drains are utilized to convey storm runoff from TWY 4 corridor.

Majority of the creeks are carried under 407 ETR through culverts. Corrugated metal culverts including circular and pipe arch culverts are found in the west half of the project. Several pipes have been rehabilitated with HDPE liner pipes, indicating the cross-sectional area may be reduced from its original design. The analysis of existing condition in this study is based on culvert sizes extracted from record drawings assuming the culvert rehabilitation did not reduce the conveyance capacity. Detailed survey is needed at later stages to update culverts sizes and materials to confirm hydraulic capacity.

A summary of the Drainage, Hydrology, Stormwater Management, and Floodplain Hydraulics Report (referred in the EPR as the "Drainage and Stormwater Management Report") is included in Chapter 5 of this EPR. The complete Report is included in **Appendix C** of this EPR.

3.1.4. Groundwater

Based on a review and plot of the MECP well records and field observations, water wells are in use throughout the study area; however, it is likely given the expansion of the urban area of the City of Burlington around the study area between Dundas Street and Brant Street that municipal water supplies are available in that area. Likewise, east of the Credit River in Mississauga and in the vicinity of Mississauga Road and Winston Churchill Boulevard, it is likely that municipal water supplies are present. Based on a review of the well records, there are a total of 482 well records within the study area.

Summary tables of well records, the locations of the wells and corresponding hydrogeological cross-sections, based on the information provided in the well records, is included in **Appendix L** of this EPR. A summary of the well record information is presented in the following table:

TABLE 3.1: WELL RECORD SUMMARY

WELL RECORD INFORMATION	NUMBER OF WELLS	COMMENTS
Total Recorded Wells	482	It is common for shallow dug wells, well points to be not recorded
Drilling Method		
Bored/Dug/Driven	177	
Cable Tool, Rotary Drilling	235	
Not Specified	63	
Use – where indicated		
Public Supply	14	Typically schools, churches, public facilities
Municipal Supply	2	Two wells at same location, plotted within Highway 401 right of way on edge of study area. Drilled in 1962.
Domestic Supply	265	
Commercial	16	
Agricultural (Irrigation, Stock)	23	
Monitoring Wells	41	
Unspecified	92	
Data		
Depth < 10 m	81	
Depth >10 m <30 m	284	
Depth >30 m	49	
edrock Aquifer	222	
Overburden Aquifer	185	
Static water Level < 3 m bgs	83	
Flowing wells	8	
High Volume Well >100 L/min test rate	4	

Of the 482 well records, 349 records are for water supply production wells, with 265 of those wells having been drilled for domestic supplies and the remainder for a combination of agricultural, commercial and public supply (schools, churches etc.). The remaining records were for test holes and

observation wells or a use was not specified. Of the recorded wells, 177 were drilled by boring, digging or drive-point. Wells installed by this method are typically relatively shallow but only 81 of the wells were less than 10 m in depth. 284 of the wells were installed between 10 m and 30 m in depth and 49 wells were installed deeper than 30 m. Across the study area, a majority of the wells were drilled into bedrock (shale) aquifers, with a lesser number of wells being installed in the overburden.

The wells in general are relatively low volume producing wells which is not unexpected given the relatively fine- grained overburden and shale bedrock – only four wells had tested pumping rates above 100 L/min. Shallow static water levels were measured in 83 of the wells, all of them located in the study area east of approximately Tremaine Road at the Oakville/Burlington border and west of the Credit River. A total of eight flowing wells were documented in the well records, six of which are located in the study area in the vicinity of the Highway 401 and 407 ETR interchange and south to Derry Road. Geologic mapping for this area shows glacial till at ground surface, but the well record cross-sections indicate the presence of water bearing sand layers beneath the till veneer at depths less than 3 m, which may be under flowing artesian conditions. The other two flowing wells are located directly east of the Credit River and along Trafalgar Road respectively. The presence of these flowing artesian water bearing zones may present challenges for the construction of the Transitway and infrastructure.

In general, the wells most susceptible to impact from the construction of the Transitway will be shallow wells (less than 10 m deep). As noted above, 81 of the recorded wells are shallow. Shallow wells are present throughout the study area. The presence of shallow stream valleys, wetlands and ponds in the vicinity of the study area suggest the possible presence of a high-water table within the upland till plain portion of the study area. High water table should also be anticipated in the stream valleys which cross the study area. As part of our assessment, we have considered the MECP's Interpretive Bulletin on Source Water Protection dated August 30, 2013. Based on on-line mapping available from the Regional Municipality of Halton: *Halton Region Water Distribution and Storage Facilities* and *Map 1D Municipal Wellhead Protection Zones, Region Official Plan* (dated December 16, 2009) and approved November 28, 2014, there are no municipal wells or wellhead protection zones in the Region of Halton portion of the study area. There is a total of 25 municipal wells in Halton Region, located north of the study area, in the communities of Georgetown, Acton and Milton. Based on on-line source water protection mapping from CTC (Credit Valley, Toronto and Region and Central Lake Ontario Conservation Authorities), the Region of Peel does not have any wellhead protection areas within the study area. Municipal wells in the Region of Peel are located to the north and west in Georgetown, Caledon and Orangeville. Therefore, the project is not located in or near any well head protection areas or intake protection zones and does not pose a significant drinking water threat to municipal wells.

In summary, the following hydrogeologic conditions are noted:

- Wells are in use for a variety of purposes within the study area, but no large volume producing wells or municipal wells are thought to be present. Many of the wells are relatively shallow and construction activities have the potential to impact shallow groundwater supply wells. The potential for impact should be further assessed in subsequent phases of the project;
- The local geology generally consists of relatively fine-grained glacial till and clay underlain by shale bedrock. Sand layers are present in places between the fine-grained surface deposits and the shale bedrock;
- A relatively shallow water table (i.e. less than 3m below ground surface) may be present throughout the study area and especially in the area of the Highway 401/407 ETR interchange and south to the Highway 403/ 407 ETR interchange, as well as the deeper valleys associated with Bronte Creek, Sixteen Mile Creek and the Credit River. Excavation and construction below the water table in saturated soils may present challenges, including the need for de-watering, especially in areas of sand deposits which are thought to be locally present within the study area;
- A total of eight flowing wells were documented in the well records, six of which are located in the study area in the vicinity of the Highway 401 and 407 ETR interchange and south to Derry Road. The presence of these flowing artesian water bearing zones may present challenges for the construction of the Transitway and infrastructure.
- Given the relatively fine-grained nature of the soils mapped and logged in the information reviewed, the study area is not generally an area of significant groundwater recharge. Some localized areas of higher groundwater recharge may be associated with the mapped sand areas; and,
- Areas of groundwater discharge are expected in stream channels and valley bottoms.

The groundwater assessment presents a generalized interpretation of hydrogeological conditions and has been based on available background information in addition to a limited windshield reconnaissance. Hydrogeological conditions within the study area will vary locally and are subject to confirmation with actual site-specific investigations including (but not limited to) boreholes, monitoring wells, test pits, groundwater hydraulic testing, chemical analysis, etc. **Appendix M** of this EPR presents the Secondary Source Groundwater Investigation completed for this project.

3.1.5. Fish and Fish Habitat

Watercourses within the study area are within the watersheds of Rambo Creek, Roseland Creek, Tuck Creek, Shoreacres Creek, Appleby Creek, Sheldon Creek, Bronte Creek, Fourteen Mile Creek, McCraney Creek, Taplow Creek, Sixteen Mile Creek and Joshua's Creek. These watersheds are within the jurisdiction of the Ministry of Natural Resources and Forestry (MNRF) Aurora District and Conservation Halton (CH). In addition, several watercourses within the Credit Valley Conservation Authority (CVC)

jurisdiction are located within the study area. These are Mullet Creek, Levi Creek, Credit River and Fletcher's Creek. A search of the 'Make a Natural Heritage Area Map' of the Natural Heritage Information Centre (NHIC; MNRF 2017; 2019), the Fisheries and Oceans Canada (DFO) aquatic species at risk mapping (2017; 2019), watershed study reports and personal correspondence with MNRF (2017a; 2019), revealed three aquatic species at risk occurring within the study limits: Redside Dace (*Clinostomus elongatus*), Silver Shiner (*Notropis photogenis*) and American Eel (*Anguilla rostrata*).

In accordance with the MTO *Environmental Guide for Fish and Fish Habitat* (2013; Fish Guide), a project notification and MNRF information request letter was sent to the MNRF Aurora District Office on July 4, 2017 (and subsequently on August 19, 2019 for the Credit River watershed), requesting information regarding the thermal regime of the watercourses located within the study area, habitat information, available data, fisheries management considerations, sensitivity and in-water timing windows for construction.

An email response was received on August 28, 2017 from Ben Keen, Management Biologist (MNRF 2017a) and from Mark Heaton, Management Biologist on August 19, 2019 (MNRF 2019). These fisheries data, including the MNRF interpretation of sensitivity, has been incorporated into the report and further details, including community information, are presented in Table 2 and Section 5.1 below. In addition, CH and CVC were contacted to request background information related to fish and fish habitat. Data regarding fish and fish habitat were received from CVC on October 10, 2018. CH provided other data, but no data regarding fisheries.

EXISTING FISH AND FISH HABITAT CONDITIONS

Aquatic habitat for each of the individual watercourse crossings within the study area is described in detail below based on the review of secondary source information and field investigations during the summer of 2018 and the spring/summer of 2019. A summary of this information, which includes habitat and fish community information, can be found in **Table 3.2.** The thermal regime, fish community, in-water timing window, important/exceptional habitat and species at risk information for each watercourse is based on data received from MNRF (and LGL's field investigation where no data was available from MNRF). Data collection followed the PILOT MTO/DFO/OMNR Protocol (2016), specifically Section 4 of the Environmental Guide for Fish and Fish Habitat (MTO 2009). Photos of the watercourse crossings and Watercourse Field Record Forms and Habitat Mapping are included in **Appendix D** (Fish and Fish Habitat Existing Conditions and Impact Assessment Report) of this EPR.

DESCRIPTION OF WATERCOURSES WITHIN THE STUDY AREA

Watercourses within the study area flow in a generally northwest to southeast direction, and ultimately drain into Lake Ontario. There is a total of 59 watercourse crossings occurring within the study area: two within the Rambo Creek watershed, one in Roseland Creek, two in Tuck Creek, three in Shoreacres Creek, two in Appleby Creek, four in Sheldon Creek, two in the Bronte Creek watershed, ten in Fourteen Mile Creek, one in McCraney Creek, one in Taplow Creek, fifteen within the Sixteen Mile Creek watershed, six within Joshua's Creek and eleven within the Credit River watershed. The locations of 407 Transitway from West of Brant Street to West of Hurontario Street Fish and Fish Habitat – Impact Assessment Report Page 24 LGL Limited environmental research associates these watercourses can be found in **Figure 3.1.**

The watercourse labels are numbered in ascending order from west to east. A total of 31 new structure/culvert watercourse crossings along the Transitway facility are proposed based on the Transitway design. All of the proposed structure/culvert crossings support fish or fish habitat either directly or indirectly (see **Table 3.2** and **Figure 3.1**). All the crossings within the study area, including those affected by the Transitway footprint are described in detail below.

RAMBO CREEK WATERSHED

Rambo Creek, and one tributary occur within the 407 Transitway study area (Sites 1-2 on **Figure 3.1).** There is a general lack of secondary source information available for these watercourses. One source however, states that much of Rambo Creek has been hardened, buried and diverted (Cook 2013).

Personal correspondence with MNRF (2017a) indicated that the Rambo Creek (Site 1) and a tributary of Rambo Creek (Site 2) are classified as warmwater and **low** sensitivity. No fish species list was available from MNRF. A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017; 2019) and NHIC Make a Map (MNRF 2017; 2019) indicated no aquatic species at risk are present in these watercourses.

Site 1 Rambo Creek

Rambo Creek is a historic watercourse that no longer exists at the surface within the study area. It has been piped under the urban developments on both sides of the 407 ETR. It is not discussed further within this report as it does not constitute fish habitat.

Site 2 Tributary of Rambo Creek

This tributary of Rambo Creek flows at the surface on the upstream side of the 407 ETR only. It enters a culvert approximately 65 m downstream (east) of Cavendish Drive and does not daylight again within the study area. The channel downstream of Cavendish Drive is straight and armoured with boulders and armourstone plunge pools. The banks are comprised of vertical armourstone walls for much of its length. The channel curves at the end to enter a large concrete culvert that has a large, smooth concrete drop structure at its entrance. It also has a large steel grate to keep

debris from entering what is assumed to be a storm water system downstream of 407 ETR.

Upstream of Cavendish Drive, the channel is in a more natural state with vegetated banks, coarse substrates (boulder, cobble, gravel) and a deciduous riparian forested floodplain. The Cavendish Drive culvert is a large concrete structure with steel debris grates on the upstream end. It contains coarse substrates.

MNRF originally classified this watercourse as warmwater and **low** sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF **low** sensitivity designation. This channel constitutes indirect fish habitat. No fish were observed. A local resident informed LGL that small fish used to inhabit the watercourse at this location, but that none have

been observed since it was piped downstream.

ROSELAND CREEK WATERSHED

Roseland Creek occurs within the 407 Transitway study area (Site 3 on Figure 2). According to the secondary source review, which included an Environmental Assessment that occurred for the Roseland Creek Rehabilitation Study from Upper Middle Road to Guelph Line (Aquafor Beech Limited 2014).

Roseland Creek is highly urbanized, with many barriers to fish movement. Electrofishing sampling undertaken for this study in 2014 resulted in no fish captured between Upper Middle Road and Guelph Line. Personal correspondence with MNRF (2017a) indicated that Roseland Creek is warmwater and low sensitivity. No fish species list was available from MNRF. A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated no aquatic species at risk are present in this watercourse.

Roseland Creek

This watercourse does not flow at the surface within most of the study area. Upstream of 407 ETR it is completely underground/piped. Downstream the watercourse daylights/emerges approximately 230 m from the edge of the 407 ETR right-of-way (ROW) into an engineered channel flowing through residential developments. This watercourse is not discussed further within this report as effects from this project on this watercourse are unlikely.

TUCK CREEK WATERSHED

Two crossings of Tuck Creek occur within the 407 Transitway study area. These crossings include Tuck Creek, and one tributary **(Sites 4-5 on Figure 3.1).**

According to the secondary source review, which included an Environmental Assessment that occurred for the Tuck Creek Erosion Control Project (Aquafor Beech 2012), Tuck Creek supports a resident warmwater fish community, and migratory Rainbow Trout (CH 2009a). This report stated Tuck Creek is designated as a coldwater fishery by Conservation Halton. Personal Correspondence with MNRF (2017a) indicated that Tuck Creek and the tributary are classified as warmwater and low sensitivity. Fish community data from the secondary source review are presented in Table 1. A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated no aquatic species at risk are present in this watercourse.

Site 4 Tributary of Tuck Creek

This watercourse is piped throughout the study area with the exception of a 30 m long open channel located between Guelph Line and the 407 ETR ROW. This engineered channel contains a large plunge pool, a riffle section and is lined with concrete at its downstream end. It emerges from a corrugated steel pipe (CSP) and enters another CSP downstream. The watercourse does not flow at the surface for greater than 530 m downstream of this section. MNRF originally classified this watercourse as warmwater and low sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF low sensitivity designation. It constitutes indirect fish habitat only.

Site 5 Tuck Creek

Tuck Creek is mostly piped through the study area. The creek enters the underground system approximately 85 m upstream of the 407 ETR ROW and emerges approximately 275 m downstream of the ROW (total piped length approximately 505 m). MNRF originally classified this watercourse as warmwater and low sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF low sensitivity designation. However, because this watercourse is piped for such a long section under residential areas, it is unlikely that a crossing structure will be needed for the Transitway.

SHOREACRES CREEK WATERSHED

Three tributaries of Shoreacres Creek occur within the 407 Transitway study area **(Sites 6-8 on Figure 3.1).** According to the secondary source review, which included an Environmental Assessment that occurred for the Shoreacres Creek Erosion Control Project (Cole Engineering 2015), Shoreacres Creek supports a warmwater forage fish community. Habitat conditions were noted to be degraded with a low productive capacity. Fish community data from the secondary source review is presented in **Table 3.2.** Personal correspondence with MNRF (2017a) indicated that all three tributaries of Shoreacres Creek are classified as warmwater and low sensitivity. No fish species list was available from MNRF. A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated no aquatic species at risk are present in this watercourse.

Site 6 Tributary of Shoreacres Creek

This watercourse was likely realigned in the past to travel between agricultural fields within a narrow strip of deciduous trees. During the spring visit, the watercourse was flowing with clear water, but was dry during the summer site visit with some standing water. There is an access lane that crosses the channel upstream of 407 ETR. Flows were restricted here as the CSP under the laneway was small. Downstream of the laneway the channel is straight, rocky and well-vegetated with both riparian and instream herbaceous vegetation. The rocks in this section are large and angular. Approximately 7 m upstream of the 407 ETR crossing, the channel drops over an approximately 2 m high gabion basket wall to a riffle below. The gabion forms a barrier to fish passage. The CSP was embedded with gravel and cobble substrates. The channel is incised near the laneway crossing but is wider and shallower upstream in the area between the agricultural fields. Morphology was comprised mainly of runs with pools and riffles comprising the remainder. Wetted widths vary from 0.5 m to 1.5 m and depths from 10 cm to 30 cm. Bankfull widths range from 2.5 m to 5.0 m and bankfull depths from 50 cm to 100 cm. Substrates are mainly coarse and are comprised of gravel, cobble, boulder, sand and silt.

MNRF originally classified this watercourse as warmwater and low sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF low sensitivity designation. This watercourse constitutes indirect fish habitat from the gabion baskets

upstream. Fish (cyprinids) were observed in the pool at the upstream end of the 407 ETR culvert. Therefore, from the gabion basket downstream, this watercourse becomes direct fish habitat.

Site 7 Tributary of Shoreacres Creek

This tributary of Shoreacres Creek is very similar to the watercourse at Site 6: it flows between agricultural fields, drops approximately 2 m upstream of the 407 ETR culvert and contains direct fish habitat. The drop at Site 7 is a rocky ramp comprised of angular stones instead of gabion baskets. As such, it does not comprise a permanent barrier to fish passage as a cyprinid was observed in the channel upstream of it during the spring site visit. Cyprinids were also observed at the upstream end of the culvert both during the spring and summer visits. Like Site 6, water flows intermittently, but a refuge pool exists at the upstream end of the 407 ETR culvert (embedded corrugated steel pipe arch - CSPA).

Upstream of the rocky ramp, the channel meanders through deciduous trees where there is a lot of bank undercutting, but no evidence of erosion. Further upstream the channel splits where it flows through a meadow marsh between the trees and the agricultural field. Some of the flow goes into the drainage ditch to the west/south of the 407 ETR culvert and some spreads out within the marsh vegetation. A main low flow channel continues upstream, however. Morphology is comprised mainly of runs (65%) with riffles (25%) and pools (10%) making up the remainder. Substrates are generally coarse (boulder, cobble, gravel, sand) at the downstream end near the 407 ETR and finer in the marsh habitat upstream (silt). Channel width ranges from 0.4 m to 1.5 m and depths from 5 cm to 30 cm. Bankfull width is estimated at 2.0 m and bankfull depth at 35 cm to 100 cm.

MNRF originally classified this watercourse as warmwater and low sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF low sensitivity designation. This watercourse constitutes direct fish habitat. Fish (cyprinids) were observed in the pool at the upstream end of the 407 ETR culvert during both the spring and summer site visits. Unlike the gabion baskets at Site 6, the rocky ramp at this site does not constitute an absolute barrier to fish passage as a fish was observed upstream of it. As such, it is likely only a partial barrier that is potentially navigable by fish during periods of high flows.

Site 8 Tributary of Shoreacres Creek

The watercourse at Site 8 crosses the 407 ETR through twin CSPAs, the northern/eastern of which conveys the majority of the flows with the other culvert perched approximately 30 cm higher. Flows from upstream come from two separate channels, the smaller of which is located to the north/east and the larger of which is located to the south/west. Both channels are defined, although the smaller one is less so. Both are located in treed areas between agricultural fields and both were flowing during the spring site visit and were dry during the summer visit. Thus, flows are intermittent. The smaller channel meanders through a small deciduous forest and originates in a large wet area at the east end of a plowed field. It travels under the ROW fence and enters the 407 ETR roadside ditch from where it flows to the upstream end of the culvert. The larger, more defined channel travels directly to the culvert. As it approaches the crossing, there is a relatively steep drop in elevation down a slope lined with large angular stone (similar to Site 7 and likely a barrier to fish passage). The channel through deciduous trees is slightly incised with a morphology mainly of runs with some riffles. Large woody debris is common. Substrates are comprised of gravel, silt, cobble and boulder.

MNRF originally classified this watercourse as warmwater and low sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF low sensitivity designation. This watercourse likely constitutes indirect fish habitat as no fish were observed during field investigations, as they were at Sites 6 and 7.

APPLEBY CREEK WATERSHED

Two crossings of watercourses within the Appleby Creek watershed occur within the 407 Transitway study area: Appleby Creek and one tributary (Sites 9-10 on Figure 2). According to the secondary source review, which included a review of the Urban Creeks and Supplemental Monitoring Report (CH 2009a), Appleby Creek is reported to be in “good condition” according to the Index of Biotic Integrity (IBI). The fish community reported from this source is reflective of a tolerant warmwater/coolwater fish community. Personal correspondence with MNRF (2017a) indicated that the two crossings in the Appleby Creek watershed are warmwater and low sensitivity.

A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated no aquatic species at risk are present in this watercourse.

Site 9 Appleby Creek

The watercourse at this site is located in a marshy area between two agricultural fields and parallels a farm access laneway. It travels in a generally east to west direction toward the corner of the field where it turns near the base of the Walker’s Line road slope prior to entering the twin CSPA culverts that convey flows under the 407 ETR. The watercourse was flowing during the spring site visit but was dry during the summer visit. Thus, it is an intermittent watercourse. The floodplain is generally well vegetated with grasses and was very saturated during the spring visit. Upstream the channel meanders through a meadow marsh. The majority of the flows are contained within the channel (spring conditions) but there are several places where water leaves the channel and spreads out into the adjacent fields. The channel is deeply incised and consists mostly of runs with a few pools. Water was clear, but no fish were observed. The laneway culvert is buried and undersized, though it still conveys flows. However, much overtopping occurs during high flow periods. The channel runs through dense trees/shrubs before entering the culvert. Rip rap was the main substrate in this section upstream of the crossing with a concrete pad located within the first meter upstream of the culvert. During the spring visit water was flowing through both culverts, although the western (higher) culvert received flows mainly from a small marsh located along the fence line of the ROW. Some overflow from the main channel also entered this culvert. Neither culvert is embedded and flows through them were very shallow during the spring visit which would make fish passage difficult.

MNRF originally classified this watercourse as warmwater and low sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the MNRF low sensitivity designation. It constitutes indirect fish habitat only.

Site 10 Tributary of Appleby Creek

Due to property access issues, this site was only visited once during the summer season. The watercourses that crosses through the lined (with black smooth plastic) CSP culvert conveys flows from two small channels/swales through/between agricultural fields combined with ditch flows from the 407 ETR roadside ditch. The channel and the culvert were dry during the summer site visit. As a result, this watercourse should be considered intermittent. Due to thick vegetation growth, a defined channel could not be discerned from the ROW. Both channels, however, convey flows to the roadside ditch through the ROW fencing and there was no debris evident on the fence indicating that large flows are not common. Both channels were lined with grasses with a few sparse cattails in places. The ditch vegetation was similar. It is likely that this watercourse constitutes indirect fish habitat only.

MNRF originally classified this watercourse as warmwater and **low** sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the MNRF **low** sensitivity designation.

SHELDON CREEK WATERSHED

Four tributaries of Sheldon Creek occur within the 407 Transitway study area (Sites 11-14 on Figure 2). According to the secondary source review, which included a review of the Urban Creeks and Supplemental Monitoring Report (CH 2009a), the thermal regime of Sheldon Creek is classified as warmwater, based on temperature logger data. The fish community reported; however, is reflective of a wamwater/coolwater fish community. Brown Trout (Salmo trutta) were also recorded in this watershed; however, the annual sampling location is in close proximity to Lake Ontario. It is assumed that due to the high summer temperatures recorded by the temperature logger data, Brown Trout could not be supported in this watershed. No information on Sheldon Creek was provided from MNRF (2017a). The fish species list from the secondary source review is presented in **Table 3.2.** A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated no aquatic species at risk are present in this watercourse.

Site 11 Tributary of Sheldon Creek

The watercourse at Site 11 is a swale through an agricultural field. During the spring site visit flow was present, although very little. The swale upstream of the ROW fence was plowed through and did not contain any habitat features or riparian vegetation. Water accumulates at the edge of the field and then flows into a steeply sloped, grassy swale toward the culvert. There is no defined channel at this location. Most of the flow entering the lined (with black smooth plastic pipe) CSP culvert was from the roadside ditch to the north/east. This conveys water from Site 12 (discussed below). The flow through the culvert was very narrow and shallow with no substrates. The channel and ditch were dry during the summer site visit. MNRF did not assign a classification or a sensitivity category for this watercourse. Based on the results of the field investigation, and the available secondary source information, LGL proposes that this feature be classified as warmwater and low sensitivity. It flows ephemerally and constitutes indirect fish habitat only.

Site 12 Tributary of Sheldon Creek

The watercourse at Site 12 travels along the edge of deciduous forest that gradually narrows towards the 407 ETR and divides two agricultural fields. The watercourse travels under the ROW fence and enters the ditch from where it flows to the crossing at Site 11. There is no crossing of the 407 ETR at this location. The watercourse was flowing during the spring site visit and dry during the summer visit. The channel is very poorly defined upstream and gradually becomes defined as the gradient increases closer to the ROW fence line where it receives additional swale flow from the adjacent agricultural field. Downstream of the fence, a rip rap slope conveys flows into the roadside ditch. MNRF did not assign a classification or a sensitivity category for this watercourse. Based on the results of the field investigation, and the available secondary source information, LGL proposes that this feature be classified as warmwater and low sensitivity. It flows ephemerally and constitutes indirect fish habitat only.

Site 13 Tributary of Sheldon Creek

The watercourse at this site consists of an undefined drainage swale located between two agricultural fields. There was a small amount of flow during the spring site visit and no flow during the summer visit. Upstream, water flows through an undefined channel at the edge of a deciduous wooded strip separating the two fields. Water then enters a large area of *Phragmites* from which it flows diffusely through grasses to a lined (with smooth black plastic), small diameter CSP culvert that conveys flows across the 407 ETR. MNRF did not assign a classification or a sensitivity category for this watercourse. Based on the results of the field investigation, and the available secondary source information, LGL proposes that this feature be classified as warmwater and low sensitivity. It flows ephemerally and constitutes indirect fish habitat only.

Site 14 Tributary of Sheldon Creek

The watercourse at this site consists of an undefined swale conveying surface drainage through grasses between two agricultural fields. Very little flow was evident during the spring site visit and no flow during the summer visit. Water is conveyed under the 407 ETR through a smooth black plastic pipe culvert.

MNRF did not assign a classification or a sensitivity category for this watercourse. Based on the results of the field investigation, and the available secondary source information, LGL proposes that this feature be classified as warmwater and low sensitivity. It flows ephemerally and constitutes indirect fish habitat only.

BRONTE CREEK WATERSHED

One crossing of Bronte Creek (Lower Main Branch) occurs within the 407 Transitway study area **(Site 15 on Figure 3.1).** According to the secondary source review, which included a review of the Bronte Creek Monitoring Report (CH 2012), Bronte Creek in the vicinity of the study area is a coolwater watercourse with a high diversity of fish species. Bronte Creek supports seasonal salmonid runs and is a candidate watershed for the second phase of the Atlantic Salmon (Salmo salar) reintroduction program. The Bronte

Creek monitoring report indicated that Silver Shiner, a species at risk, are present (CH 2012). The Bronte Creek monitoring report also indicated this watercourse historically supported populations of Redside Dace in 17 locations throughout the watershed. It is reported that Redside Dace were only captured at 3 locations since the late 1990s (CH 2009b), and these locations are upstream of the 407 Transitway study area. Redside Dace is listed as "Endangered" provincially under the Endangered Species Act (ESA) and listed as "Endangered" federally under the Species at Risk Act (SARA).

In addition, a small tributary of Bronte Creek **(Site 15a on Figure 3.1)** flows through the agricultural field to the south/west of the main branch. It does not support direct fish habitat although it is located upstream of species at risk habitat (see below).

A species at risk screening using the NHIC Make a Map (MNRF 2017; 2019) revealed Silver Shiner and American Eel as occurring within this watercourse. DFO Aquatic Species at Risk Mapping (DFO 2019) indicates that Silver Shiner is present, but that no critical habitat for this species occurs within the study area.

Personal correspondence with MNRF (2017a) indicated that Silver Shiner and American Eel are present within this watercourse. Silver Shiner is listed as "Threatened" provincially and federally under the ESA SARA, respectively. American Eel is listed as "Endangered" provincially under the ESA but is not listed federally. This watercourse has been given a **high** sensitivity designation by MNRF and classified as warmwater. The fish species list from the secondary source review and MNRF is presented in **Table 3.1.**

Site 15 Bronte Creek

Bronte Creek is a large river that flows within a wide valley system through the study area. Valley slopes and the floodplain are well-vegetated with mature deciduous forests and wetlands. Vertical, or nearvertical, slopes are present at the outside bends where the wetted channel abuts against them. Two relatively large islands/bars lie within the channel upstream of the 407 ETR crossing. Morphology is a mix of runs and riffles. Substrates are mainly coarse and comprised of cobble, boulder, gravel, exposed shale bedrock and silt. Some emergent vegetation is present along the banks of the river. No submerged vegetation was observed during the site visits, but much algae growth was present. Instream cover is provided by instream and overhanging vegetation, woody debris, boulder and cobble. Widths vary with the areas around island/bar locations generally wider than the sharper bends that abut the vertical slopes. The widest point in the study area was approximately 27 m in a run-riffle-run reach located between the two islands/bars. The narrowest area was approximately 16 m where the run habitat abuts the vertical bank upstream of the 407 ETR bridge. Depths ranged from 10 cm in riffles to 30 cm in runs. Bronte Creek crosses under the 407 ETR through two three-span bridges situated high above the watercourse. Downstream of the crossing riparian habitats are similar to upstream. Channel morphology is also similar, although there are no islands/bars. Runs and riffles dominate here and channel widths range from 10 m to 22 m. Water depths ranged from 10 cm in riffles to 40 cm in runs. There is a sharp bend in the river approximately 50 m downstream of the crossing where the channel abuts a large and relatively long vertical slope.

MNRF classified this watercourse as warmwater with **high** sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **high** sensitivity designation as Silver Shiner, American Eel and migratory salmonids have been reported or are known to occur. This watercourse flows permanently and supports direct fish habitat. Many fish were observed during LGL's field investigations, including migratory Chinook Salmon, Fathead Minnow, Creek Chub, Common Shiner, White Sucker, *Lepomis* sp. and Johnny Darter.

Site 15a Tributary of Bronte Creek

This watercourse was not mapped on historic MNRF mapping. It consists of a deeply incised channel that meanders through an active agricultural field to the west of Bronte Creek. The 407 ETR ROW is wide in this location and a small section of deciduous forest exists downstream (south) of the fence line through which this feature flows. A small amount of flow was present during the spring visit but the channel was dry in the summer. The gradient is large enough that the channel has cut a deep swathe through both the upstream field and the downstream forest. Slopes are near vertical along much of its length and the banks are heavily eroded throughout. Although it is likely that this feature can be considered to have ephemeral flows, they are large and powerful enough to cause the erosion that is evident at the site. Substrates consist of boulders cobbles and gravel with some silt and exposed clay. The feature crosses under the 407 ETR through a lined (with smooth black plastic pipe) CSP that is on a skew. Water then enters the end of the roadside ditch that runs along the south side of the highway and is heavily lined with large, angular stone, before being conveyed over the high vertical bank that forms the bank of Bronte Creek downstream of the bridge crossing (see section above).

At this location, flows have eroded the vertical slope such that it is set back from the Bronte Creek water's edge. MNRF did not assign a classification or a sensitivity category for this watercourse. Based on the results of the field investigation, and its proximity to Bronte Creek, LGL proposes that this feature be classified as warmwater and **low-moderate** sensitivity. It flows ephemerally and constitutes indirect fish habitat only but is located upstream of species at risk habitat.

FOURTEEN MILE CREEK WATERSHED

Ten crossings of watercourses within the Fourteen Mile Creek watershed occur within the 407 Transitway study area: nine tributaries and the main branch **(Sites 16-25 on Figure 3.1).** A secondary source review was conducted, which included a review of the Urban Creeks and Supplemental Monitoring Report (CH 2009a). According to the CH (2009a), Fourteen Mile Creek has diverse habitat and supports a variety of species including Redside Dace. Rainbow Trout (Oncorhynchus mykiss) and Brown Trout have also been recorded in this watershed (likely in close proximity to Lake Ontario). However, temperature data indicates this watercourse supports a warmwater thermal regime. A review of the North Oakville Creeks Subwatershed Study (TSH et al 2006) indicates that the Transitway corridor intersects the headwater regions of Fourteen Mile Creek. This report classified the habitat quality of each of these tributaries in the vicinity of Highway 407. Sites 16, 17, 18 and 21 were reported to provide "marginal habitat". Sites 20, 22 and 24 were reported to provide "important habitat". Sites 19, 23 and 25 were reported as "not fish habitat". A species at risk screening using the NHIC Make a Map (MNRF 2017) and DFO Aquatic Species at Risk Mapping (DFO 2017) indicated Redside Dace are present in Fourteen Mile Creek.

Personal correspondence with MNRF indicated that Sites 16-23 are upstream of Redside Dace occupied habitat and Sites 24-25 are upstream of Redside Dace recovery habitat, indicating that the Fourteen Mile Creek watercourses within the Transitway study area may not be within regulated habitat. Sites 16-18, 20, 22, and 23-25 are classified by MNRF as coldwater and moderate sensitivity. Sites 19, and 21 are classified by MNRF as an unknown thermal regime and moderate sensitivity. The fish species list from the secondary source review and MNRF is presented in **Table 3.2.**

Site 16 Tributary of Fourteen Mile Creek

The feature at this crossing consists of a swale densely vegetated with grasses, *Phragmites* and cattails. There is no defined channel and no flow was observed during both the spring and summer site visits, although there were wet areas during spring and evidence of recent flows. The feature crosses the 407 ETR through twin CSP culverts that both have corroded bottoms. Flow is directed through the west culvert as the eastern culvert is blocked with sandbags.

MNRF classified this watercourse as coldwater with **moderate** sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 17 Tributary of Fourteen Mile Creek

The feature at Site 17 consists of an undefined swale that originates upstream (west) of Tremaine Road that passes through a small diameter CSP culvert and enters the ditch at the bottom of the Tremaine Road slope. From there, water is conveyed southward through this *Phragmites*-lined ditch and into a CSP culvert that passes under the 407 ETR. There is a high gradient within the CSP culvert, the culvert is not countersunk and there is evidence of corrosion along its bottom. A small amount of flow was observed during the spring site visit and the feature was dry during the summer.

MNRF classified this watercourse as coldwater with moderate sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the moderate sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 18 Tributary of Fourteen Mile Creek

The feature at Site 18 consists of a narrow, grass-lined swale between agricultural fields. Just upstream of the 407 ETR ROW it flows along the edge of a small meadow marsh before passing under the fence and into three lined (with smooth black plastic) CSP culverts for conveyance under the highway. The culverts are longer than normal as they pass under a truck inspection station and the highway. Flows were observed during the spring visit and the feature was dry in the summer. Active agriculture (plowing, planting, etc.) is within 1 m of the feature in many locations upstream and evidence of vehicle fording is present at the upstream end of the meadow marsh. There is a small drop in the elevation of the channel immediately downstream of the ROW fence and the water spreads out evenly across rip rap into all three culverts when flowing.

MNRF classified this watercourse as coldwater with **moderate** sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 19 Tributary of Fourteen Mile Creek

This feature consists of an undefined swale located between two agricultural fields. The swale is grasslined and contained very little flow during the spring site visit and was dry during the summer visit. Flows are conveyed across the 407 ETR through a lined (with smooth black plastic) CSP culvert. Immediately downstream of the culvert is a large patch of *Phragmites.*

MNRF classified this watercourse as coldwater with **moderate** sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 20 Tributary of Fourteen Mile Creek

This feature consists of a swale with a poorly defined located between two agricultural fields. The swale is grass-lined and contained flow during the spring site visit and was dry during the summer visit. Flows are conveyed across the 407 ETR through a lined (with smooth black plastic) CSP culvert. Immediately downstream of the culvert is a large patch of *Phragmites*. A permanent pool of water exists in the small patch of trees just downstream of the ROW. It contained water during both visits and was vegetated with Sphagnum moss. No fish were observed during the site visits and the farmer, who has been on this land for 65 years, has never observed fish within this feature.

MNRF classified this watercourse as coldwater with **moderate** sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 21 Tributary of Fourteen Mile Creek

This feature consists of an undefined swale located between two agricultural fields. The swale is grassand cattail-lined and contained flow during the spring site visit and was dry during the summer visit. Flows are conveyed across the 407 ETR through a lined (with smooth black plastic) CSP culvert. Immediately downstream of the culvert is a small patch of *Phragmites*. A wider patch of cattails and grasses exists further downstream, downstream of which is a plowed-through section that contained tire tracks of vehicles that had traversed the swale. Further downstream, the gradient increases and a defined channel begins to form prior to the drainage feature entering a deciduous forest. MNRF classified this watercourse as coldwater with moderate sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the moderate sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 22 Fourteen Mile Creek

Fourteen Mile Creek at the 407 ETR crossing is a small, intermittent and well-defined watercourse that passes under the highway through three lined (with smooth black plastic) CSP culverts. The channel is poorly defined immediately downstream of the culverts as it is wide (water is conveyed through all three culverts) and contains dense marsh vegetation (cattails and grasses). A defined channel begins just downstream of this area (just downstream of the ROW fence) and meanders through a shallow valley vegetated mainly with grasses. The channel was flowing during the spring visit and was not during the summer. However, there was standing water throughout the watercourse during the summer site visit. Morphology is mostly riffles and runs with few pools. The channel is narrow with wetted widths ranging from 0.4 m to 1.0 m. Depths ranged from 10 cm to 50 cm. Bankfull widths ranged from 1.0 m to 1.2 m and bankfull depths from 30 cm to 80 cm. Substrates are comprised of silt, cobble, boulder and gravel. The grassy banks were eroding at outside bends and in some locations had slumped into the channel. No fish were observed during the site visits.

MNRF classified this watercourse as coldwater with moderate sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the moderate sensitivity and the flexibility regarding the in-water work timing window, as this watercourse flows intermittently and constitutes indirect fish habitat only.

Site 23 Tributary of Fourteen Mile Creek

This feature consists of a swale located within an agricultural field. The swale is lined with *Phragmites* at the upstream end which transitions to cattails, then grasses and finally becomes plowed-through. This feature contained very little flow during the spring site visit and was dry during the summer visit. Flows are conveyed across the 407 ETR through twin-lined (with smooth black plastic) CSP culverts.

MNRF classified this watercourse as coldwater with **moderate** sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window. This watercourse flows ephemerally and constitutes indirect fish habitat only.

Site 24 Tributary of Fourteen Mile Creek

The watercourse at Site 24 is permanently flowing with a well-defined channel that is conveyed under the 407 ETR through four lined (with smooth black plastic) CSP culverts. Water was flowing during both the spring and summer site visits and fish were observed. Flow is conveyed through all four culverts and, as a result, the channel is very wide at this location. At the downstream end of the culverts, the channel is lined with rip rap and there is dense growth of cattails and some *Phragmites*. The channel quickly narrows and flows in a straight line for 40 m to 50 m. In this section wetted width is fairly wide (2 m) and shallow (10 cm) and is lined with cattails. The banks are grassy and there is an area of rip rap that appears to be used as a ford for vehicles. From the end of this section, the channel narrows further (1 m wide, 10 cm deep) as it enters an area with more natural vegetation (cattails and dense grasses) which extends for another 30 m. There it enters a cattail marsh with a large open water pond. The pond is approximately 38 m long and 18 m wide and is ringed with cattails. From the pond, the channel reforms and meanders away from the 407 ETR in a relatively narrow (1.5 m wide), incised channel approximately 20 cm deep. With the exception of the pond, almost the entire channel is comprised of run habitat with very few riffles. Instream cover is mainly provided by emergent vegetation. Recent restoration (plantings and fencing) is evident along the channel downstream of the pond and around the pond itself.

MNRF classified this watercourse as coldwater with **moderate** sensitivity because of the presence of Redside Dace downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window, as this watercourse is located far upstream of SAR habitat. This watercourse flows permanently and constitutes direct fish habitat.

MCCRANEY CREEK WATERSHED

One crossing of a tributary of McCraney Creek occurs within the 407 Transitway study area (Site 26 on Figure 3.1). According to the secondary source review, which included a review of the Urban Creeks and Supplemental Monitoring Report (CH 2009a), the thermal regime of McCraney Creek is classified as warmwater, based on temperature logger data. The fish community reported; however, is reflective of a wamwater/coolwater fish community and includes Rainbow Trout (likely in close proximity to Lake Ontario). A review of the North Oakville Creeks Subwatershed Study (TSH et al 2006) indicates that this tributary is reported as “not fish habitat”. A species at risk screening using the NHIC Make a Map (MNRF 2017) and DFO Aquatic Species at Risk Mapping (DFO 2017) indicated no aquatic species at risk are present in this watercourse. Personal correspondence with MNRF (2017a) indicated that this tributary of McCraney Creek within the study area is warmwater and **low** sensitivity. The fish species list from the secondary source review and MNRF is presented in **Table 3.2.**

Site 26 Tributary of McCraney Creek

This feature consists of a poorly defined swale located within an agricultural field. The swale is incised and lined with cattails and grasses intermittently. There are eroding banks along most of the swale and plowing occurs to the swale's edge for much of the reach investigated. The drainage feature contained very little flow during the spring site visit and was dry during the summer visit, with some pockets of standing water. Flows are conveyed across the 407 ETR through a lined (with smooth black plastic) CSP culvert. Immediately downstream of the culvert the channel consists of the roadside ditch at the base of the 407 ETR road slope. This area, and the area immediately downstream of the ROW fence is lined with *Phragmites*.

MNRF classified this watercourse as warmwater with **low** sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows ephemerally and constitutes indirect fish habitat only.

TAPLOW CREEK WATERSHED

One crossing of Taplow Creek occurs within the 407 Transitway study area **(Site 27 on Figure 3.1).** This watercourse was not included in the initial request for data from MNRF since the mapping used for secondary source screening did not show a watercourse extending within the study area. A review of the North Oakville Creeks Subwatershed Study (TSH et al 2006) indicated this watercourse extends up to the 407 Transitway study area. This report, however, also indicated Taplow Creek within the study area reach is reported as an agricultural swale, and "not fish habitat". No other secondary source information for this watercourse was available.

A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated that no aquatic species at risk are present in this watercourse.

Site 27 Tributary of Taplow Creek

No channel or swale was located in the vicinity of this site. During the spring visit, a small area of wet ground was observed south/east of the woodlot where water may flow away from the ROW in a hedgerow between two agricultural fields. In addition, there is no crossing of the 407 ETR for this feature. These features do not constitute as fish habitat and is not discussed further.

SIXTEEN MILE CREEK WATERSHED

Fifteen crossings of watercourses within the Sixteen Mile Creek watershed occur within the 407 Transitway study area: two tributaries of the Sixteen Mile Creek main branch, the main branch of Sixteen Mile Creek, and 11 tributaries of East Sixteen Mile Creek**. (Sites 28-35 & 42-48 on Figure 3.1).** A secondary source review was conducted, which included a review of the Sixteen Mile Creek, Grindstone Creek and Supplemental Monitoring Report (CH 2011). This report states that fish species within this watershed range from warmwater forage species to coldwater sportfish and reports the species diversity within this watershed is high. A species at risk screening using the NHIC Make a Map (MNRF 2017) and DFO Aquatic Species at Risk Mapping (DFO 2017) indicated no aquatic species at risk are present in the watercourses within the study area. Personal correspondence with MNRF (2017a), however, revealed that Silver Shiner are present in Sixteen Mile Creek within the study area.

Personal correspondence with MNRF (2017a) reported that Site 28 is classified as coolwater and **moderate** sensitivity (upstream of Silver Shiner habitat), Site 29 is classified as coolwater and **high** sensitivity (Silver Shiner habitat), Sites 30-35 are classified as coolwater and **low-moderate** sensitivity (upstream of Silver Shiner habitat), Sites 42-48 are classified as warmwater and low-moderate sensitivity (upstream of Silver Shiner habitat). Fish community data from the secondary source review and MNRF is presented in **Table 3.2.**

Site 28 Tributary of Sixteen Mile Creek

The small watercourse at this site is conveyed under the 407 ETR through a large, lined (with smooth black plastic) CSP culvert. The downstream end of the culvert discharges onto a concrete pad and there are metal pillars in this location, likely to prevent the use of the culvert by ATVs or other motorized vehicles. The culvert is not embedded, and it contains no substrates. There was a small amount of flow through the culvert during the spring visit and it was not flowing during the summer site visit. There is a large area of *Phragmites* downstream of the concrete pad through which water flows diffusely. The remainder of the channel investigated is poorly defined and meanders through grassy vegetation. There is a crossing of the old Burnhamthorpe Road remnant approximately 80 m downstream of the 407 ETR culvert. Here there are three buried CSP culverts that convey flow under the old roadway. Water is pooled at the upstream side due to poor conveyance. Downstream of this area, the channel bends toward Sixteen Mile Creek and continues flowing along the edge of a grassy field.

MNRF classified this watercourse as coolwater with **moderate** sensitivity because of the presence of Silver Shiner downstream. MNRF also stated that the in-water work timing window is flexible and dependent upon the type of work being proposed. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **moderate** sensitivity and the flexibility regarding the in-water work timing window. This drainage feature flows ephemerally and constitutes indirect fish habitat only.

Site 29 Sixteen Mile Creek

Sixteen Mile Creek is a large watercourse that meanders through a large, steeply sloped valley. The 407 ETR passes over this watercourse via two very long, multi-span bridges. The watercourse morphology is comprised of riffles and runs in the reach investigated. Wetted widths range from 16 m to 30 m, but average 18 m. Depths are fairly shallow and range from 15 cm to 30 cm. Substrates are coarse and comprised of shale boulders, cobble and gravel with shale bedrock exposed in some areas. Eroding, vertical shale banks are abundant along the watercourse. There is very little instream vegetation which is limited to sparse emergent species growth along the channel margins with some overhanging grasses and trees. Filamentous green algae is very common and grows on the shale boulders. Instream cover is provided by boulders, cobbles, filamentous green algae and some patchy submerged vegetation. Riparian vegetation is comprised of meadow and deciduous forest.

MNRF classified this watercourse as coolwater with **high** sensitivity. Based on the results of the field

investigation, and the available secondary source information, LGL agrees with the **high** sensitivity designation as Silver Shiner and migratory salmonids have been reported or are known to occur. This watercourse flows permanently and supports direct fish habitat. Many fish were observed during LGL's field investigation, including Smallmouth Bass, Blacknose Dace, Creek Chub, Common Shiner, White Sucker, Northern Hog Sucker, Notropis sp. and Johnny Darter.

Site 30 Tributary of Sixteen Mile Creek

The feature at Site 30 consists of a very steeply sloped, large angular stone-lined drainage channel that conveys flows from the storm water pond located on the north/east side of the 407 ETR. At the bottom of the slope, the angular stone ends and the water travels overland to the south/east parallel to Sixteen Mile Creek. There is no defined channel or swale in this location.

MNRF classified this watercourse as coolwater with **low-moderate** sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner and migratory salmonids have been reported or are known to occur downstream. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 31 Tributary of Sixteen Mile Creek

The drainage features at Site 31 no longer exists. Road modifications along Fourth Line and the construction of a large berm and a storm water management pond have altered the overland flow in this area. As such, the upstream reaches of the Site 31 and Site 32 drainage features have been removed and replaced with roadside ditches along Fourth Line that convey flows into a storm water pond that has been constructed upslope from the Sixteen Mile Creek valley. These ditches do not constitute fish habitat and are not discussed further.

Site 32 Tributary of Sixteen Mile Creek

See section above.

Site 33 Tributary of Sixteen Mile Creek

Similar to Sites 31 and 32 above, the drainage feature at Site 33 no longer exists due to the construction of the Neyagawa Boulevard exit from the 407 ETR. As such, this feature is not discussed further within this report.

Site 34 Tributary of Sixteen Mile Creek

This feature appears to begin in the forest outside of the 407 ETR ROW north/west of the 407 ETR westbound exit lane to Neyagawa Boulevard. Ditch drainage likely contributes flows to this feature. However, it does not constitute fish habitat.

Site 35 Tributary of Sixteen Mile Creek

The feature at this site consists of a drainage swale/ditch that conveys overland site drainage from the topsoil facility north/west of the 407 ETR, east of Sixth Line and the agricultural fields south/east of the 407 ETR. There is a lined (with smooth black plastic) CSP that conveys flows from south/east to north/west across the 407 ETR adjacent to Sixth Line. These flows enter the ditch that travels along the ROW from the east (where the flows from the topsoil facility originate) and crosses under Sixth Line through a small culvert. From there it travels through a grassy swale that bends back into the 407 ETR ROW. From there it travels in a straight swale/ditch that is bermed on both sides from where flows are conveyed into the forest habitat further to the south.

MNRF classified this watercourse as coolwater with **low-moderate** sensitivity. Based on the results of the field investigation, and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner and migratory salmonids have been reported or are known to occur downstream. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 42 Tributary of East Sixteen Mile Creek

The watercourse at Site 42 has been modified in the past into a riverine wetland with significant ponding. It crosses under the 407 ETR via a single-span bridge. This area was not examined in detail due to the severe restrictions on constructing the runningway through this inundated area. This watercourse, however, is discussed in detail in the following sections.

MNRF classified this feature at Site 42 as warmwater and with **low-moderate** sensitivity. Based on the results of the field investigations and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner have been reported or are known to occur downstream. This watercourse flows permanently and supports direct fish habitat.

Site 43 Tributary of East Sixteen Mile Creek

This section will describe the watercourse that parallels the 407 ETR from the confluence of the watercourse that enters the creek from the east from the large storm water ponds east of Ninth Line, north of Britannia Road. The next section will describe the watercourse upstream of this confluence. It should be noted that there is no 407 ETR crossing at Site 43 (at least one was not located during field investigations). However, this watercourse and the watercourse that emanates from the storm water ponds will be considered Site 43.

Approximately 265 m upstream (north) of Britannia Road, the watercourse from the storm water ponds east of Ninth Line converges with the watercourse that parallels the 407 ETR. The channel from the storm water ponds is approximately 400 m long, of which 250 m is channelized within concrete or rip rap. The downstream 150 m is in a more natural state with tight meanders and natural banks. The channelized section is approximately 1.5 m wide and its depth is approximately 50 cm. It is comprised solely of run habitat and no instream vegetation is present. The more natural section is wider (2 m to 5 m) and contains submerged vegetation and cattails along the banks and within the channel. Riparian vegetation is comprised mainly of grasses throughout both the channelized and natural areas. Fish were observed in both the upstream storm water pond and in the channel (cyprinids, Common Carp, Black Crappie). Water was turbid and flowing during both the spring and the summer site visits.

The natural channel at the end of the channelized section is very similar to the remainder of the combined channel downstream of the confluence. Most of the flow comes from the storm water ponds

upstream rather than the channel that parallels the highway upstream of the confluence. This upstream channel was flowing during both site visits, however, and the water was clear. The main channel downstream of the confluence meanders significantly and contains mainly run habitat. Widths range from 4 m to 7.5 m. Cattails are prevalent throughout the reach from the confluence to south of Britannia Road: they are growing both within the channel in many locations and along the banks. Submerged vegetation was also common throughout the reach examined. A large ponded section exists upstream of the Britannia Road crossing that is approximately 40 m by 40 m. Although it contains much open water, cattail growth is significant. The channel downstream of the pond narrows slightly as it passes under the Britannia Road westbound to 407 ETR northbound ramp bridge. It then widens under the Britannia Road structure before narrowing again as it exits the bridge. The gradient increases in this reach with riffles becoming common. As a result, channel widths are narrower and range from 2 m to 4.5 m. Fewer cattails are growing in the riparian area here and there are more shrubs (mainly willows). Instream cover throughout the watercourses is provided by submerged and emergent vegetation, overhanging vegetation and some boulders. Substrates are mainly fine (silt) with some boulders and cobbles under the bridges and in the downstream riffles.

MNRF classified this feature as warmwater and with **low-moderate** sensitivity. Based on the results of the field investigations and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner have been reported or are known to occur downstream. This watercourse flows permanently and supports direct fish habitat.

Site 44 Tributary of East Sixteen Mile Creek

This next section describes the watercourse both upstream and downstream of the confluence of a tributary that conveys flows across the 407 ETR through a twin-cell concrete box culvert at Site 44. The description extends from approximately 165 m upstream of the confluence downstream to the large online ponds south of Derry Road. The watercourse in this description is the one that parallels the 407 ETR and joins the channel emanating from the storm water pond described in the previous section.

A pool exists throughout and just downstream of the twin-cell concrete box culvert at Site 44. The pool is approximately 30 cm deep and the water was clear at the times of the surveys. Very little flow was noted during the spring visit and it was not flowing during the summer site visit. Brook Stickleback were observed in the pool during the spring site visit. The pool contains floating vegetation (duckweed) and submerged vegetation. The channel narrows significantly and becomes a 1 m wide, cattail and grasslined swale.

Approximately 80 m downstream of the culvert, the swale is joined by another, smaller swale from the north. This swale had very little flow during the spring visit and is also lined with grasses. Upstream there is a relatively large online meadow marsh through which it flows diffusely. This feature will be described further in the next section.

Further downstream of the confluence mentioned above, the swale gradually widens. It has been straightened and likely used to run between agricultural fields along a hedgerow. These fields are overgrown now. Trees line the swale, but many have fallen. As a result, woody debris is very common. Water was flowing during the spring site visit and was approximately 20 cm deep in many locations. Instream vegetation was comprised of grasses and purple loosestrife. Substrates are fine and comprised of silt and detritus. An old farm lane crosses the channel and the buried, undersized culvert restricts flow causing a pool to form on its upstream side. Downstream of this laneway, water flows diffusely for approximately 65 m through grasses, *Phragmites* and cattails. After this section, the channel becomes more incised, narrower and deeper as there is an elevation drop for approximately 30 m before the swale flattens again upstream of the Derry Road culvert. The channel then widens and flows through all three cells of the triple-cell concrete culvert (main flow is through middle cell). The water in the middle cell is approximately 30 cm deep throughout.

The channel downstream of Derry Road is similar to that found upstream. It is relatively narrow (1.5 m to 3 m wide) and shallow (10 cm to 15 cm deep). It is mainly comprised of run habitat through *Phragmites* and cattails. Substrates are fine (silt, detritus) and instream cover is the same as that found upstream. The watercourse was found to be flowing during both the spring and summer site visits.

Further downstream (approximately 535 m), the watercourse enters two large, online storm water ponds. The first pond is smaller (approximately 68 m by 120 m) than the second (370 m by 135 m). There is a small channel connecting the two ponds. The ponds outlet via a CSP culvert with a control valve attached to it located at the south end of the larger pond. The outlet discharges into a small pond (27 m by 24 m) and then the watercourse continues for another 1.6 km before it reaches the confluence with the larger watercourse. MNRF classified this feature as warmwater and with **low-moderate** sensitivity. Based on the results of the field investigations and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner have been reported or are known to occur downstream. This watercourse flows permanently and supports direct fish habitat.

Site 45 Tributary of East Sixteen Mile Creek

The feature at this site consists of a small channel that emanates from a concrete box culvert that crosses the 407 ETR at the south end of the interchange with Highway 401. It conveys flows from a storm water pond located between the two highways. Water then enters another storm water pond on the east side of the 407 ETR and exits into a channel at the pond's south end. The channel widens at the ROW fence at which is a large pool with dense cattail growth. The wide swale that emanates from this pool gradually narrows and the cattails become replaced by grasses. This swale travels across a meadow for approximately 190 m before traveling under a driveway through a very small black plastic culvert. From there it travels another 420 m to a railroad crossing. Once crossing under the railroad tracks, it parallels them for approximately 50 m before turning 90 degrees and traversing 330 m where it enters the meadow marsh (mentioned above). This feature was flowing during the spring visit but was not flowing during the summer site visit.

MNRF classified this feature as warmwater and with **low-moderate** sensitivity. Based on the results of the field investigations and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner have been reported or are known to occur downstream. This watercourse flows intermittently and supports direct fish habitat.

Site 46 Tributary of East Sixteen Mile Creek

This small watercourse is conveyed across the eastbound 407 ETR to eastbound Highway 401 ramp via a concrete box culvert. Downstream of the culvert, the channel is wide, densely vegetated with cattails and undefined. There are two direct connections to a small, dug pond that had both inflow and outflow. The channel then leaves this wide area and enters a driving range where it rapidly narrows and flows through manicured grass. Cattails and *Phragmites* are present within the channel. At the south end of the driving range the watercourse passes under a laneway that has an undersized culvert. As a result of this culvert, water is backed up upstream and the channel is wider here. Downstream of this crossing, the channel loses definition as it enters an area of dense cattails and *Phragmites*. There is a rip rap slope located within the *Phragmites* patch over which the watercourse flows. It is relatively steep and forms a barrier to fish passage. The channel then turns 90 degrees to the east and flows toward its confluence with the watercourse described in the next section.

MNRF classified this feature as warmwater and with **low-moderate** sensitivity. Based on the results of the field investigations and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner have been reported or are known to occur downstream. This watercourse flows permanently and supports indirect fish habitat.

Site 47 Tributary of East Sixteen Mile Creek

This small watercourse is conveyed across the eastbound Highway 401 to eastbound 407 ETR ramp via CSP culverts. The watercourse downstream of this crossing is a straight, cattail channel with no definition or low flow channel. Flow was observed during both the spring and summer site visits. The channel converges with a wetland channel from road drainage to the west. There are steep banks until the channels merge. The straight channel is approximately 7 m wide with water depth of 10 cm to 15 cm. Adjacent uplands are cultural meadow to the west and agricultural to the east. Steep rip-rap (likely a barrier to fish passage) is present at the end of the combined channel where it meets the channel coming from the west (mentioned in previous section). Here flows from Site 47 join flows from Site 46. Water in this watercourse travels to the east for approximately 170 m before turning 90 degrees to the south. From the bend south, the watercourse has been realigned between two properties and the floodplain has been planted with trees and shrubs. No fish were observed.

MNRF classified this feature as warmwater and with **low-moderate** sensitivity. Based on the results of the field investigations and the available secondary source information, LGL agrees with the **low-moderate** sensitivity designation as Silver Shiner have been reported or are known to occur downstream. This watercourse flows permanently and supports indirect fish habitat.

Site 48 Tributary of East Sixteen Mile Creek

This feature is comprised of a large wetland dominated by cattails and Phragmites that lies adjacent to a large storm water pond from which it receives water. Water flows out of it via a concrete box culvert under Highway 401. The site was very wet during the spring site visit, but flows were not observed. It was dry during the summer site visit.

MNRF did not provide a classification or sensitivity for this feature. However, as it is located within the East Sixteen Mile Creek subwatershed and in close proximity to the watercourse at Site 47, LGL has classified it as warmwater and with **low-moderate** sensitivity based on the results of the field investigations and the available secondary source information, and because Silver Shiner have been reported or are known to occur downstream. This watercourse flows ephemerally and supports indirect fish habitat.

JOSHUA CREEK WATERSHED

Six crossings of watercourses within the Joshua's Creek watershed occur within the 407 Transitway study area **(Sites 36-41 on Figure 3.1).** A secondary source review was conducted, which included a review of the Urban Creeks and Supplemental Monitoring Report (CH 2009a). This report states that the species composition and diversity is low in this watershed. Tolerant, warmwater species are present, and temperature monitoring indicates warmwater conditions. Rainbow Trout appeared on the Urban Creeks Report species list; however, these likely would have been captured in close proximity to Lake Ontario.

A review of the North Oakville Creeks Subwatershed Study (TSH et al 2006) indicates that the 407 Transitway study area is in a headwater region of this watershed. Habitat conditions were reported for these tributaries of Joshua's Creek in the area of the 407 Transitway: Sites 36-39 were reported to not support fish habitat, Site 40 was reported as "marginal habitat" and no information was available for Site 41.

A species at risk screening using the DFO Aquatic Species at Risk Mapping (DFO 2017) and NHIC Make a Map (MNRF 2017) indicated no aquatic species at risk are present in this watercourse. Personal correspondence with MNRF (2017a) indicated that all crossings of watercourses within the Joshua's Creek watershed within the study area are classified as warmwater and **low** sensitivity.

Site 36 Tributary of Joshua's Creek

Water flow at Site 36 has been modified historically through the construction of the 407 ETR and the Trafalgar Road interchange, and the construction of the GO Bus station and parking lot south of the interchange. As such, water flow is directed along a series of ditches within the west side of the cloverleaf, with some flows originating on the north side of the highway. Flows are generally conveyed from west to east and cross Trafalgar Road through a CSP culvert south of the GO Bus station bus entrance. Water also travels from a storm water pond in the southeast quadrant of the interchange through a cattail- and *Phragmites*-lined ditch to a confluence with the water coming from the west side of Trafalgar Road just downstream of the CSP culvert.

From there, water is conveyed to the east through an agricultural field. There is a ford comprised of concrete cinder blocks and rip rap downstream of this confluence. The swale traverses the agricultural field within a small, vegetated (grasses, Phragmites) corridor and is not plowed through. Another source of water to this feature originated is a small wetland pond situated north of a driveway. The pond is bermed and contains mainly cattails with Phragmites as well. Water exits the pond and travels under the driveway via a very small concrete culvert. It then enters the agricultural field and travels approximately

150 m to its confluence with the swale discussed above. The swale that emanates from the pond is plowed through, but not planted with crops, so it does not have any riparian vegetation associated with it. The majority of flows travel through the first channel discussed. Both were flowing during the spring visit and were not flowing during the summer site visit. Standing water was present in several locations during the summer visit, however.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low s**ensitivity designation. This watercourse flows intermittently and supports indirect fish habitat only.

Site 37 Tributary of Joshua's Creek

The feature at Site 37 consists of a small swale that originates in the southern ditch of the 407 ETR. At the edge of the ROW to approximately 30 m downstream, the swale flows through a very dense stand of Phragmites. From there the swale traverses an area of grasses and sparse Phragmites before entering an agricultural field. The entire swale is approximately 200 m long and much of it is plowed through. At its downstream end, as it nears its confluence with the swale associated with Site 38 (see below), the gradient increases and the swale downcuts into the soil. Only here is there any riparian vegetation (grasses). There was a small amount of flow observed during the spring site visit and the swale was dry during the summer visit. MNRF classified this feature as warmwater and low sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the low sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 38 Tributary of Joshua's Creek

The feature at Site 38 consists of a larger swale than that described above at Site 37. This feature is conveyed under the 407 ETR via a small concrete box culvert. At the downstream end of the culvert through the ROW to approximately 40 downstream, the swale flows through very dense Phragmites. Similar to Site 37, the swale continues through an area of grasses, sparse Phragmites and cattails before entering an agricultural field. Likely due to a higher gradient than at the previous site, this swale is not plowed through, but is incised from the edge of the field southward. As such, a narrow riparian area exists along its banks and consists of grasses, Phragmites and some cattails. The swale ends approximately 330 m downstream at the edge of the agricultural field. From this point onward, water is conveyed as sheet flow through a hay field for another approximately 285 m where it meets flows coming south from Site 39. From this confluence, flows travel south out of the study area. There was a small amount of flow observed during the spring site visit and the swale was dry during the summer visit.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 39 Tributary of Joshua's Creek

The feature at Site 39 is conveyed across the 407 ETR via a small concrete box culvert. Within the first 40 m of the culvert, water flows through dense Phragmites. After emerging from the Phragmites, a short section (<20 m) of defined channel occurs bordered by meadow marsh. From there, the channel becomes diffuse again and water flows through another stand of Phragmites. From there it exits the *Phragmites* into a hay field. There is a barely discernable swale through this field where water travels southward away from the road for approximately 175 m to the confluence with the swale from Site 38. From there, water travels to the south out of the study area. There was a very small amount of flow in this feature during the spring site visit and it was dry during the summer visit.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 40 Tributary of Joshua's Creek

The feature at Site 40 is conveyed across the 407 ETR via a small concrete box culvert. Within the first 35 m of the culvert water flows diffusely through dense grasses. From there it exits the vegetation into a hay field. The swale acquires some definition here but appears to have been plowed through in the past: there are patches of natural riparian vegetation in between these plowed through areas. There was a very small amount of flow in this feature during the spring site visit and it was dry during the summer visit.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 41 Tributary of Joshua's Creek

The feature at Site 41 is conveyed under the 407 ETR via a concrete box culvert. The channel appears to originate in the agricultural fields to the north as a plowed through swale. At the southeast corner of the field, the swale loses its definition and water spreads out, but continues to flow toward the culvert. Upstream of the culvert, which is located at the edge of a grassy area between two fields, two narrow channels form within approximately 40 m of the culvert entrance. These channels are incised and convey flows into the culvert from the water that accumulates from overland drainage from the north. There was flow in through the culvert during the spring visit and standing water during the summer visit.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat only.

CREDIT RIVER WATERSHED

Nine crossings of watercourses within the Credit River watershed occur within the 407 Transitway study area: Mullet Creek, Levi Creek, the main branch of the Credit River, two tributaries of the main branch (Sites 52-54 are one crossing), three tributaries of Fletcher's Creek and Fletcher's Creek (Sites 49-59 on Figure 3.1). A species at risk screening using the NHIC Make a Map (MNRF 2019) indicated no aquatic species at risk are present in the watercourses within the study area. DFO Aquatic Species at Risk Mapping (DFO 2019); however, showed an extirpated, endangered or threatened species within both

Levi and Fletcher's Creek within the study area. Personal correspondence with MNRF (2019) also indicates that Redside Dace is present in Fletcher's Creek within the study area but did not indicate that any species at risk is present in Levi Creek.

Personal correspondence with MNRF (2019) reported that Sites 50 and 59 are classified as coolwater and warmwater, respectively, and that both are of moderate sensitivity; Sites 51 and 58 are classified as coolwater and warmwater, respectively, and that both are of high sensitivity; Sites 49, 52-54, 55, 56 and 57 are classified as warmwater and low sensitivity. Fish community data from the secondary source review and MNRF is presented in **Table 3.2.**

Site 49 Mullet Creek

Mullet Creek is a small, permanently flowing watercourse that passes under the 407 ETR via two single span bridges. Riparian vegetation is generally open (cultural meadow and meadow marsh) with some deciduous tree cover further downstream. The channel is narrow and incised with a mean width of 0.5 m and a mean depth of 15 cm. Morphology consists almost exclusively of runs with a small open wetland (marsh) off a side channel near the bridge. Substrates are comprised of boulders, gravel and cobble near the bridge and gravel and silt further downstream. Riparian vegetation growth is robust and overhanging grasses, cattails and other emergent species are common. Bank undercutting is prevalent and provides instream covert, along with emergent vegetation. Mullet Creek receives outflow from a storm water pond located to the west via a short (30 m) channel. Fish (cyprinids) were observed during both the spring and summer site visits.

MNRF classified this feature as warmwater and **low s**ensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows permanently and supports direct fish habitat.

Site 50 Levi Creek

Levi Creek is a medium-sized, permanently flowing watercourse that passes under the 407 ETR via three single-span bridges. It is bordered by cultural meadow and cultural woodland (deciduous) vegetation communities and is mainly only partially shaded by overhanging riparian grasses in the section examined downstream of the highway. Morphology is a mix of mainly runs and riffles, with two pools observed during the site investigations. Depths ranged from 10 cm in riffles to 40 cm in pools and widths from 3 m to 5.5 m. Substrates were comprised of sand, boulder, cobble, gravel and silt and the water during both the spring and summer visits was clear. Instream cover is comprised of overhanging vegetation, boulders and woody debris. Instream vegetation was not common and comprised of a few emergent species. Many cyprinids were observed during both the spring and summer visits. During the spring site visit, Common Shiner were observed spawning and during the summer visit, juvenile Largemouth Bass were observed.

MNRF classified this feature as coolwater and **moderate** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **moderate** sensitivity designation. This watercourse flows permanently and supports direct fish habitat.

Site 51 Credit River

The Credit River is a large watercourse that passes under the 407 ETR via two multi-span bridges. It flows through a wide valley dominated by cultural meadow and meadow marsh vegetation communities. Morphology in the section examined is dominated by riffles and runs with one pool observed approximately 150 m upstream and another immediately downstream of the highway crossing in a side channel. Two islands are located within the channel immediately upstream of the crossing structures. Channel widths average between 20 m and 24 m (with a few wider areas up to 50 m where there are islands) and depths from 20 cm to 40 cm. The upstream pool is approximately 45 m long and 30 m wide and the downstream pool measures 30 m long and 20 m wide. Both pools are up to 50 cm deep. While the downstream pool contains some emergent vegetation, the main channel does not. Substrates are comprised of boulder, cobble, gravel and sand with some silt in the pool and behind current breaks. Instream cover is provided by boulders and cobble and some submerged vegetation. Banks are mainly stable with the exception being the long bend in the river downstream of the crossing that has exposed vertical banks. Many fish were observed (cyprinids) and this river is known for migratory salmonids.

MNRF classified this feature as coolwater and **high** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **high** sensitivity designation. This watercourse flows permanently and supports direct fish habitat.

Sites 52-54 Tributary of Credit River

Historically, this site was comprised of three separate watercourses that converged downstream (south) of the 407 ETR. These sites now comprise two engineered channels that merge into one feature that crosses under the 407 ETR via twin CSP culverts. Upstream the two channels drain toward the 407 ETR culverts diagonally and do not meet until the upstream end of the culverts. The west channel is very small and narrow and appears to originate in a large pond within a cemetery. The eastern watercourse is larger and consists of a straightened channel with a series of weirs. Upstream of the straightened section (which is approximately 290 m long), the channel appears to be piped. Riparian vegetation is grassy for the western channel and consists of a narrow strip of riparian deciduous trees for the eastern channel. During the site visits, flow was coming through the eastern culvert only, although the western culvert was wet. There is a defined, but braided channel downstream through dense thicket vegetation. Flow blockages are common throughout the first 75 m downstream of the crossing and were made by logs and woody debris. A light-colored gravel spill appears to have occurred recently as this material was deposited within 50 m of the culverts. Several short riffles and stagnant pools are present within this section. Organic and woody debris are very common as is evidence of high flows which were up to 60 cm above the water level during the spring visit. Some of the water passing through the culvert appears to go to a cattail marsh located adjacent to the channels to the east. Flow is generally constricted within the first 75 m of the crossing due to the presence of a dirt road/track that crosses the watercourse. It has been built up and blocks all overland flows and directs it to a low point where water flows at the surface across the road/track. Downstream of the road/track, an incised channel through meadow marsh habitat continues for approximately 50 m before flows appear to spread out into the very large meadow marsh located north of the Credit River.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows intermittently and supports indirect fish habitat.

Site 55 Tributary of Credit River

The feature at this site is an ephemeral swale that appears to begin south of the 407 ETR. It contains some *Phragmites* growth at its upstream end (likely where it receives road run off) but is vegetated with terrestrial vegetation further downstream. It crosses under a condominium access road via a CSP culvert and enters a wooded area. This feature is located south of the project footprint and is not discussed further.

Site 56 Tributary of Fletcher's Creek

The feature at this site consists of a swale between agricultural fields. Its origin appears to be the 407 ETR ROW upstream (north) of the highway, where it only conveys surface drainage. It passes under the highway via a concrete box culvert. It travels across the power line corridor and enters the storm water system of the residential development west of McLaughlin Road. It is not fish habitat and is, therefore, not discussed further.

Site 57 Tributary of Fletcher's Creek

This feature no longer receives flows from upstream (north) of the 407 ETR and there is no crossing associated with it. It is an ephemeral swale that contains little aquatic/wetland vegetation at its upstream end (within the runningway footprint area) but does further downstream near its confluence with Fletcher's Creek (where there are willows and some cattails). There is no defined channel and the feature was dry during both the spring and summer site visits. It appears to only convey surface drainage from the surrounding cultural meadows and agricultural lands. Its contribution to the habitat in Fletcher's Creek is likely negligible.

MNRF classified this feature as warmwater and **low** sensitivity. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the **low** sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat only.

Site 58 Fletcher's Creek

Fletcher's Creek is a medium-sized, permanently flowing watercourse that passes under the 407 ETR via two two-span bridges. It meanders through a relatively small valley bordered by agricultural fields, an electrical yard and residential subdivision. Riparian vegetation is generally herbaceous and consists of grasses and other meadow/wet meadow species. There are a few large willow trees that provide shade and cover to the watercourse. Giant hogweed was present during the summer visit but had been cleared the following spring. Morphology consists mainly of runs and pools with very few riffles. Water was clear during the summer site visit, but turbid in the spring. There is an abundance of submerged aquatic vegetation throughout the watercourse. Substrates consists of gravel, cobble, detritus, boulders and silt. Some armoring of the bends has occurred with large, angular boulders. Instream cover is provided by submerged aquatic vegetation, boulders, undercut banks and some woody debris. A few areas of bank erosion were noted where the watercourse bends at high, steep bank areas. Channel widths ranged from 3 m to 7 m and depths from 15 cm to over 50 cm. Fish (cyprinids) were observed throughout the section examined.

MNRF classified this feature as warmwater and high sensitivity due to the presence of Redside Dace. Based on the results of the field investigations, and the available secondary source information, LGL agrees with the high sensitivity designation. This watercourse flows permanently and supports direct fish habitat.

Site 59 Tributary of Fletcher's Creek

This tributary of Fletcher's Creek was dry during the spring and summer field investigations during the previous 407 Transitway study (it was not re-examined for this project). The channel within the limits of the study area is not defined, and vegetation is predominately terrestrial, consisting of grasses and *Phragmites*. Construction for utilities has recently occurred in the area, and a wetted depression was present within this works area. Downstream of the transitway corridor a more defined channel, densely vegetated with cattails is present. No evidence of any critical habitat features was noted. This watercourse functions as ephemeral drainage and does not appear to constitute as fish habitat within the study limits. Flow/standing water was not present; therefore, sampling was not conducted by LGL.

MNRF classified this watercourse as warmwater, **moderate** sensitivity due to the proximity to Redside Dace habitat and because there is a large colony of a chimney crayfish species present. Based on the results of the previous field investigations, and the available secondary source information, LGL agrees with the **moderate** sensitivity designation. This watercourse flows ephemerally and supports indirect fish habitat.

AQUATIC SPECIES AT RISK

Rambo Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Rambo Creek watershed within the vicinity of the study area (DFO 2017; 2019; MNRF 2017; 2019).

Roseland Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Roseland Creek watershed within the vicinity of the study area (Aquafor Beech Limited 2014; DFO 2017; 2019; MNRF 2017; 2019).

Tuck Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Tuck Creek watershed within the vicinity of the study area (Aquafor Beech 2012; DFO 2017; 2019; MNRF 2017; 2019).

Shoreacres Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Shoreacres

Creek watershed within the vicinity of the study area (Cole Engineering 2015; CH 2009a; DFO 2017; 2019; MNRF 2017; 2019).

Appleby Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Appleby Creek watershed within the vicinity of the study area (CH 2009a; DFO 2017; 2019; MNRF 2017; 2019).

Sheldon Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Sheldon Creek watershed within the vicinity of the study area (CH 2009a; DFO 2017; 2019; MNRF 2017; 2019).

Bronte Creek Watershed

According to a review of secondary source data, three species at risk have been identified in this watershed in the vicinity of the study area: Redside Dace, Silver Shiner and American Eel.

Redside Dace has been historically present in reaches upstream of the study area (CH 2009b), and personal correspondence with MNRF did not indicate any Redside Dace habitat is currently present. It is therefore unlikely that Redside Dace are present within the study limits. Personal correspondence with MNRF (2017a) indicated that Silver Shiner and American Eel are present in Bronte Creek within the study limits.

Fourteen Mile Creek Watershed

According to a review of secondary source data, Redside Dace has been identified in Fourteen Mile Creek in the vicinity of the study area (CH 2009a; DFO 2017; 2019; MNRF 2017; 2019).

Personal correspondence with MNRF indicated that Sites 16-23 are upstream of Redside Dace occupied habitat and Sites 24-25 are upstream of Redside Dace recovery habitat, indicating that the Fourteen Mile Creek watercourses within the Transitway study area may not be within regulated habitat.

McCraney Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the McCraney Creek watershed within the vicinity of the study area (CH 2009a; TSH et al. 2006; DFO 2017; 2019; MNRF 2017; 2019).

Taplow Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Taplow Creek watershed within the vicinity of the study area (CH 2009a; TSH et al. 2006; DFO 2017; 2019; MNRF 2017; 2019).

Sixteen Mile Creek Watershed

According to a review of secondary source data, Silver Shiner has been identified in Sixteen Mile Creek in the vicinity of the study area (CH 2011; DFO 2019; MNRF 2017; 2019).

According to personal correspondence with MNRF (2017a), Sites 28, 30-35, 42-47 are upstream of Silver Shiner habitat and are, therefore, potentially not regulated habitat. Site 29 is direct Silver Shiner habitat and is regulated as such.

Joshua's Creek Watershed

According to a review of secondary source data, no aquatic species at risk occur within the Joshua's Creek watershed within the vicinity of the study area (CH 2009a; TSH et al. 2006; DFO 2017; 2019; MNRF 2017; 2019).

Credit River Watershed

According to a review of secondary source data, Redside Dace has been identified in Fletcher's Creek in the vicinity of the study area (DFO 2017; 2019; MNRF 2017; 2019).

Personal correspondence with MNRF indicated that Site 58 is occupied Redside Dace habitat, indicating that the Fletcher's Creek within the Transitway study area is within regulated habitat for this species.

CRITICAL FISH HABITAT

The study limits were reviewed for the potential presence of critical habitat (i.e., spawning areas, groundwater discharge, nursery habitat, seasonal refugia, etc.). There was no evidence of critical habitat within any of the watercourses investigated.

SENSITIVITY/SIGNIFICANCE

The watercourses within the study area support a diversity of warmwater, coolwater and coldwater fish communities; however, all of the watercourses in the study area have experienced some type of impact from urbanization.

Based on correspondence with MNRF (2017a; 2019), the habitat sensitivities of the watercourses located within the study limits range from low to moderate to high. No data regarding habitat sensitivity was provided for five of the watercourses.

Redside Dace is listed provincially as an 'Endangered' species and is regulated by the Ontario *Endagered Species Act* (ESA), 2007. Watercourses which support this species will require specialized mitigation measures to prevent negative impacts to this species and/or its habitat. All best management practices (BMPs) outlined in the Draft Guidance for Development Activities in *Redside Dace Protected Habitat* (MNR 2011) will need to be incorporated into the project design. An ESA 17(2)(c) overall benefit permit may be required from the MECP during Detail Design if proposed works will detrimentally affect the regulated habitat. In addition, because Redside Dace are listed on Schedule 1 under SARA, a permit under that regulation may also be required.

Silver Shiner is listed provincially as a "Threatened" species and is regulated by the Ontario ESA, 2007. Silver Shiner is also listed as "Threatened" federally under the *Species At Risk Act* (SARA). Specialized mitigation for this species may be required, and an ESA 17(2)(c) overall benefit permit may be required from the MECP and a SARA permit from Fisheries and Oceans Canada (DFO) during Detail Design if proposed works will detrimentally affect the regulated habitat.

American Eel is listed as “Endangered” provincially under the ESA. American Eel is not listed federally. Specialized mitigation for this species may be required, and an ESA 17(2)(c) overall benefit permit may be required from the MECP during detail design if proposed works will detrimentally affect the regulated habitat.

THERMAL REGIME

The watercourses within the study area support a mix of warmwater, coolwater and coldwater fish communities. In-water works timing windows were provided by MNRF in accordance with the protocol. Warmwater watercourses are subject to an in-water timing window of July 1 to March 31. Coldwater and Redside Dace watercourses are subject to an in-water timing window of July 1 to September 15.

FIGURE 3.1: 407 TRANSITWAY WEST – FISHERIES OPPORTUNITIES AND CONSTRAINTS

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
RAMBO CREEK WATERSHED														
16- 20003	Site 1: Rambo Creek	4800120	594774 mE	Piped/ unknown	Warmwater	None	Not provided (MNRF 2017a) Not sampled by LGL (piped)	N/A	N/A	N/A	N/A	N/A	July 1- March 31	Low
	Site 2: Tributary of Rambo Creek	4801021 mN	594468 mE	Permanent	Warmwater	Indirect	Not provided (MNRF 2017a) Not sampled by LGL (no fish present due to piped conditions downstream/barriers)	Boulder, cobble, gravel, sand, silt, concrete debris, armourstone	Some grasses & cattails downstream of Cavendish Drive. None upstream	N/A	N/A	N/A	July 1- March 31	Low
ROSELAND CREEK WATERSHED														
16- 20003	Site 3: Roseland Creek	4802580 mN	594842 mE	Piped/ permanent downstream	Warmwater	None	Not provided (MNRF 2017a) No catch (CH 2018)	N/A	N/A	Watercourse piped	N/A	N/A	July 1- March 31	Low
TUCK CREEK WATERSHED														
16- 20003	Site 4: Tributary of Tuck Creek	4803103 mN	594603 mE	Permanent/ piped upstream and downstream	Warmwater	Indirect	Creek Chub, Blacknose Dace, Fathead Minnow, Goldfish, White Sucker (MNRF 2017a; Aquafor Beech Ltd 2012) Common Shiner, Rainbow Trout (Aquafor Beech Ltd 2012)	Boulder, cobble, silt, gravel, concrete	Grasses	Watercourse piped	N/A	N/A	July 1- March 31	Low

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
	Site 5: Tuck Creek	4803636 mN	594537 mE	Piped/ unknown	Warmwater	None	Creek Chub, Blacknose Dace, Fathead Minnow, Goldfish, White Sucker (MNRF 2017a; Aquafor Beech Ltd 2012) Common Shiner, Rainbow Trout (Aquafor Beech Ltd 2012)	N/A	N/A	Watercourse piped	N/A	N/A	July 1- March 31	Low
SHOREACRES CREEK WATERSHED														
16-20003	Site 6: Tributary of Shoreacres Creek	4804396 mN	594464 mE	Intermittent	Warmwater	Direct	Not provided (MNRF 2017a) Fathead Minnow (CH 2018) White Sucker, Blacknose Dace, Creek Chub, Bluntnose Minnow, Brook Stickleback (Cole Engineering 2015)	Gravel, sand, silt, cobble, boulder	Grasses	Small CSP under laneway constricts flows; replacement with larger culvert would aid flow conveyance. Gabion basket drop forms barrier to fish passage. Removal would allow fish passage.	N/A	N/A	July 1- March 31	Low
	Site 7: Tributary of Shoreacres Creek	4804734 mN	594443 mE	Intermittent	Warmwater	Direct	Not provided (MNRF 2017a) Fathead Minnow (CH 2018) White Sucker, Blacknose Dace, Creek Chub, Bluntnose Minnow, Brook Stickleback (Cole Engineering 2015)	Gravel, silt, sand, boulder	Grasses	N/A	N/A	N/A	July 1- March 31	Low
	Site 8: Tributary of Shoreacres Creek	4805167 mN	594433 mE	Intermittent	Warmwater	Indirect	Not provided (MNRF 2017a) White Sucker, Blacknose Dace, Creek Chub, Bluntnose Minnow, Brook Stickleback (Cole Engineering 2015)	Gravel, silt, cobble, boulder	Grasses	Elevation drop a barrier to fish passage. Reduction in drop could allow fish passage.	N/A	N/a	July 1- March 31	Low

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
APPLEBY CREEK WATERSHED														
16-20003	Site 9: Appleby Creek	4805723 mN	594485 mE	Intermittent	Warmwater	Direct	Creek Chub, Fathead Minnow, Pumpkinseed, White Sucker (MNRF 2017a; CH 2009a; CH 2018) Brook Stickleback (CH 2018) Blacknose Dace, Goldfish, Green Sunfish, Largemouth Bass, (MNRF 2017a) Longnose Dace (CH 2009a)	Silt, detritus, boulder (rip rap)	Grasses	Laneway culvert buried and undersized and culverts under 407 ETR not embedded. Replacing laneway culvert with larger one and adding substrates to 407 ETR culverts could improve fish passage.	N/A	N/A	July 1- March 31	Low
	Site 10: Tributary of Appleby Creek	4805971 mN	594548 mE	Ephemeral	Warmwater	Indirect	Creek Chub, Fathead Minnow, Pumpkinseed, White Sucker (MNRF 2017a; CH 2009a) Blacknose Dace, Goldfish, Green Sunfish, Largemouth Bass (MNRF 2017a) Longnose Dace (CH 2009a)	Silt, detritus, boulders (rip rap)	Grasses	N/A	N/A	N/A	July 1- March 31	Low
SHELDON CREEK WATERSHED														
16-20003	Site 11: Tributary of Sheldon Creek	4806407 mN	594705 mE	Ephemeral	Not provided	Indirect	Blacknose Dace, Brown Trout, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Green Sunfish, Hornyhead Chub, Longnose Dace, White Sucker (CH 2009a) Brook Stickleback, Pumpkinseed (CH 2018) Not provided (MNRF 2017a)	Silt, gravel, cobble, boulder	None upstream (agricultural), grasses near culvert	N/A	N/A	N/A	Not provided	Not provided
	Site 12: Tributary of Sheldon Creek	4806806 mN	594907 mE	Ephemeral	Not provided	Indirect	Blacknose Dace, Brown Trout, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Green Sunfish, Hornyhead Chub,	Silt, gravel	Grasses	N/A	N/A	N/A	Not provided	Not provided

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Longnose Dace, White Sucker (CH 2009a) Brook Stickleback, Pumpkinseed (CH 2018) Not provided (MNRF 2017a)							
	Site 13: Tributary of Sheldon Creek	4807017 mN	595044 mE	Ephemeral	Not provided	Indirect	Blacknose Dace, Brown Trout, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Green Sunfish, Hornyhead Chub, Longnose Dace, White Sucker (CH 2009a) Brook Stickleback, Pumpkinseed (CH 2018) Not provided (MNRF 2017a)	Silt	Grasses, *Phragmites*	N/A	N/A	N/A	Not provided	Not provided
	Site 14: Tributary of Sheldon Creek	4807294 mN	595267 mE	Ephemeral	Not provided	Indirect	Blacknose Dace, Brown Trout, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Green Sunfish, Hornyhead Chub, Longnose Dace, White Sucker (CH 2009a) Not provided (MNRF 2017a)	Silt	Grasses	N/A	N/A	N/A	Not provided	Not provided
BRONTE CREEK WATERSHED														
16-20003	Site 15: Bronte Creek	4808053 mN	595872 mE	Permanent	Warmwater	Direct	Common Shiner, Hornyhead Chub, River Chub, Spotfin Shiner, Fantail Darter, Johnny Darter, Tadpole Madtom, Blacknose Dace, Brown Trout, Fathead Minnow, White Perch, Pumpkinseed, Mimic Shiner, White Sucker, Rock Bass, Rainbow Smelt, Rosyface Shiner, Green Sunfish, Sea Lamprey, Common Carp, Black Crappie, Largemouth Bass, Smallmouth Bass, Cisco,	Boulder, cobble, gravel, silt, shale bedrock	Grasses, bulrush, cattail, filamentous green algae	N/A	Migratory corridor; potential salmonid spawning habitat	(Silver Shiner and American Eel habitat and, at a minimum, it's at least a seasonal migratory corridor for Lake Ontario salmonids)	July 1 – September 15	High

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Pearl Dace, Trout-Perch, Threespine Stickleback, Striped Shiner, Emerald Shiner, River Redhorse, American Eel, Logperch, Yellow Perch, Spottail Shiner, Bluntnose Minnow, Slimy Sculpin, Chinook Salmon, Golden Shiner, Brook Trout, Rainbow Darter, Central Mudminnow, Northern Pike, Longnose Dace, Silver Shiner, Rainbow Trout, Bluegill, Alewife, Stonecat, Round Goby, Creek Chub, Brook Stickleback, Brown Bullhead, Northern Redbelly Dace, Northern Hog Sucker, Striped Bass (CH 2012; MNRF 2017a) Atlantic Salmon (CH 2018)							
	Site 15a: Bronte Creek	4807965 mN	595718 mE	Ephemeral	Not provided	Indirect	Not provided (MNRF 2017a; CH 2018)	Boulder, cobble, gravel, silt	Grasses	N/A	N/A	N/A	Not provided	Not Provided
FOURTEEN CREEK WATERSHED														
16-20003	Site 16: Tributary of Fourteen Mile Creek	4809048 mN	596677 mE	Ephemeral	Coldwater	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a; MNRF 2017a) Goldfish, Brown Bullhead, Redside Dace, Pumpkinseed, Brassy Minnow, Johnny Darter, Northern Redbelly Dace, Longnose Dace, (MNRF 2017a)	Silt, boulder (rip rap)	Grasses, *Phragmites,* cattails	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
	Site 17: Tributary of Fourteen Mile Creek	4809275 mN	596856 mE	Ephemeral	Coldwater	Indirect	Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Fantail Darter (CH 2009a; MNRF 2017a) Blacknose Dace, Rainbow Darter, Brown Bullhead, Redside Dace, Pumpkinseed, Brassy Minnow, Johnny Darter, Northern Redbelly Dace, Longnose Dace, White Sucker, Fantail Darter, Fathead Minnow, Bluntnose Minnow, Common Shiner, Largemouth Bass, Creek Chub, Goldfish, Brook Stickleback (MNRF 2017a)	Silt, detritus	*Phragmites*	High gradient within CSP culvert under 407 with no substrates. Reduction in slope and the addition of substrates could provide fish passage.	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
	Site 18: Tributary of Fourteen Mile Creek	4809502 mN	597023 mE	Ephemeral	Coldwater	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a; MNRF 2017a) Rainbow Darter, Brown Bullhead, Redside Dace, Pumpkinseed, Brassy Minnow, Johnny Darter, Northern Redbelly Dace, Longnose Dace, Goldfish (MNRF 2017a)	Silt, gravel, cobble, boulder (rip rap)	Grasses	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
	Site 19: Tributary of Fourteen Mile Creek	4809671 mN	597152 mE	Ephemeral	Not provided	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a) Not Provided (MNRF 2017a)	Boulder (rip rap), silt, detritus	Grasses, *Phragmites*	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
	Site 20: Tributary of Fourteen Mile Creek	4809873 mN	597329 mE	Ephemeral	Coldwater	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a MNRF 2017a) Rainbow Darter, Brown Bullhead, Redside Dace, Pumpkinseed, Brassy Minnow, Johnny Darter, Northern Redbelly Dace, Longnose Dace, Goldfish (MNRF 2017a)	Boulder (rip rap), silt, detritus	Grasses, *Phragmites*	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
	Site 21: Tributary of Fourteen Mile Creek	4810057 mN	597453 mE	Ephemeral	Not Provided	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a) Not provided (MNRF 2017a)	Silt	Grasses, *Phragmites*, cattails	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
	Site 22: Tributary of Fourteen Mile Creek	4810373 mN	597646 mE	Intermittent	Coldwater	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a; MNRF 2017a) Rainbow Darter, Brown Bullhead, Redside Dace, Pumpkinseed, Brassy Minnow, Johnny Darter, Northern Redbelly Dace, Longnose Dace, Goldfish (MNRF 2017a)	Clay, silt, cobble, boulder	Grasses, cattails	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
	Site 23: Tributary of Fourteen Mile Creek	4810750 mN	597823 mE	Ephemeral	Coldwater	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a)	Silt, detritus	*Phragmites*, cattails	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Not provided (MNRF 2017a)							
	Site 24: Tributary of Fourteen Mile Creek	4811087 mN	597968 mE	Permanent	Coldwater	Direct	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a) Goldfish (MNRF 2017a)	Silt, cobble, boulders (rip rap)	Cattails, *Phragmites*, grasses	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
	Site 25: Tributary of Fourteen Mile Creek	4811423 mN	598059 mE	Ephemeral	Coldwater	Indirect	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Fathead Minnow, Largemouth Bass, Rainbow Darter, White Sucker, Brook Stickleback, Fantail Darter (CH 2009a) Not provided (MNRF 2017a)	Silt	Grasses	N/A	N/A	Contributing SAR habitat (Upstream of Redside Dace (RSD) occupied habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed around this crossing)	Moderate
MCCRANEY CREEK WATERSHED														
16-20003	Site 26: Tributary of McCraney Creek	4811681 mN	598127 mE	Ephemeral	Warmwater	Indirect	Common Shiner, Longnose Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, White Sucker (CH 2009a) Blacknose Dace, Fathead Minnow, Creek Chub (MNRF 2017a; CH 2009a)	Clay, gravel, cobbles	Grasses, *Phragmites*, cattails	N/A	N/A	N/A	July 1 – March 31	Low
TAPLOW CREEK WATERSHED														
16-20003	Site 27: Tributary of Taplow Creek	4811846 mN	598156 mE	Ephemeral	Not provided	None	No Information (CH 2009a) Not provided (MNRF 2017a; CH 2018))	Silt	*Phragmites*, grasses	N/A	N/A	N/A	Not provided	Not provided
SIXTEEN MILE CREEK WATERSHED														
16-20003	Site 28: Tributary of Sixteen Mile Creek	4812550 mN	598221 mE	Intermittent	Coolwater	Indirect	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout,	Concrete, silt	*Phragmites*, grasses, cattails	N/A	N/A	Contributing SAR habitat (Upstream of occupied Silver Shiner habitat)	July 1 – September 15 (Flexible on this window depending on type of works proposed	Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (CH 2011) Not provided (MNRF 2017a)						around this crossing)	
	Site 29: Sixteen Mile Creek	4813322 mN	598317 mE	Permanent	Coolwater	Direct	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout, Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a; CH 2011) Chinook Salmon, Rainbow Trout, Goldfish, Striped Shiner, Black Crappie (CH 2018)	Shale boulders, cobbles, gravel, shale bedrock	Grasses, some patchy submerged	N/A	Migratory corridor, habitat for all life stages of various species	(Silver Shiner occupied habitat)	July 1 – September 15	High

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
	Site 30: Tributary of Sixteen Mile Creek	4813745 mN	598459 mE	Ephemeral	Coolwater	Indirect	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout, Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a; CH 2011)	Rip rap boulders, silt	Grasses	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 – September 15	Low-Moderate
	Site 31: Tributary of Sixteen Mile Creek	4815250 mN	599612 mE	Ephemeral	Coolwater	None	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout, Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a; CH 2011)	Silt, rip rap boulders	Grasses, *Phragmites*	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 – September 15	Low-Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
	Site 32: Tributary of Sixteen Mile Creek	4815360 mN	599711 mE	Ephemeral	Coolwater	None	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout, Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a, CH 2011)	Silt, rip rap boulders	Grasses, *Phragmites*	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 – September 15	Low-Moderate
	Site 33: Tributary of Sixteen Mile Creek	4815508 mN	599915 mE	Ephemeral	Coolwater	None	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout, Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a, CH 2011)	Silt, rip rap boulders	Grasses, *Phragmites*	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 – September 15	Low-Moderate
	Site 34: Tributary of Sixteen Mile Creek	4815757 mN	600082 mE	Ephemeral	Coolwater	None	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout,	Silt, rip rap boulders	Grasses, *Phragmites*	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 – September 15	Low-Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a, CH 2011)							
	Site 35: Tributary of Sixteen Mile Creek	4816860 mN	600355 mE	Ephemeral	Coolwater	Indirect	Longnose Dace, Brown Bullhead, Rock Bass, Largemouth Bass, Brook Trout, Brown Trout, Stonecat, Rainbow Darter, Blacknose Dace, Common Shiner, Redside Dace, Pumpkinseed, Common Carp, White Sucker, Smallmouth Bass, Johnny Darter, Brassy Minnow, Emerald Shiner, Northern Hog Sucker, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Northern Redbelly Dace, Sea Lamprey, River Chub, Fantail Darter, Golden Redhorse, Alewife, Brook Stickleback, Rosyface Shiner, Golden Shiner, Creek Chub (MNRF 2017a, CH 2011)	Silt	Grasses	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 – September 15	Low-Moderate
JOSHUA'S CREEK WATERSHED														

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
16-20003	Site 36: Tributary of Joshua's Creek	4817950 mN	601110 mE	Intermittent	Warmwater	Indirect	Bluntnose Minnow, Common Carp, Common Shiner, Goldfish, Johnny Darter, Longnose Dace, Rainbow Trout, River Chub, Rock Bass (CH 2009a). Creek Chub, Blacknose Dace, Fathead Minnow, White Sucker (MNRF 2017, CH 2009a).	Silt, rip rap boulders	Grasses, cattails, *Phragmites*	Create buffer of from active agriculture	N/A	N/A	July 1 – March 31	Low
	Site 37: Tributary of Joshua's Creek	4818313 mN	601408 mE	Ephemeral	Warmwater	Indirect	Bluntnose Minnow, Common Carp, Common Shiner, Goldfish, Johnny Darter, Longnose Dace, Rainbow Trout, River Chub, Rock Bass (CH 2009a). Creek Chub, Blacknose Dace, Fathead Minnow, White Sucker (MNRF 2017; CH 2009a).	Silt	*Phragmites*, grasses	Create buffer of from active agriculture	N/A	N/A	July 1 – March 31	Low
	Site 38: Tributary of Joshua's Creek	4818446 mN	601518 mE	Ephemeral	Warmwater	Indirect	Bluntnose Minnow, Common Carp, Common Shiner, Goldfish, Johnny Darter, Longnose Dace, Rainbow Trout, River Chub, Rock Bass (CH 2009a). Creek Chub, Blacknose Dace, Fathead Minnow, White Sucker (MNRF 2017; CH 2009a).	Silt	*Phragmites*, grasses	Create buffer of from active agriculture	N/A	N/A	July 1 – March 31	Low
	Site 39: Tributary of Joshua's Creek	4818832 mN	601840 mE	Ephemeral	Warmwater	Indirect	Bluntnose Minnow, Common Carp, Common Shiner, Goldfish, Johnny Darter, Longnose Dace, Rainbow Trout, River Chub, Rock Bass (CH 2009a). Creek Chub, Blacknose Dace, Fathead Minnow, White Sucker (MNRF 2017; CH 2009a).	Silt	*Phragmites*, grasses	Create buffer of from active agriculture	N/A	N/A	July 1 – March 31	Low
	Site 40: Tributary of Joshua's Creek	4819053 mN	602021 mE	Ephemeral	Warmwater	Indirect	Bluntnose Minnow, Common Carp, Common Shiner, Goldfish, Johnny Darter, Longnose Dace, Rainbow Trout, River	Silt	*Phragmites*, grasses, cattails	Create buffer of from active agriculture	N/A	N/A	July 1 – March 31	Low

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Chub, Rock Bass (CH 2009a). Creek Chub, Blacknose Dace, Fathead Minnow, White Sucker (MNRF 2017; CH 2009a).							
	Site 41: Tributary of Joshua's Creek	4819528 mN	602432 mE	Ephemeral	Warmwater	Indirect	Bluntnose Minnow, Common Carp, Common Shiner, Goldfish, Johnny Darter, Longnose Dace, Rainbow Trout, River Chub, Rock Bass (CH 2009a). Creek Chub, Blacknose Dace, Fathead Minnow, White Sucker (MNRF 2017; CH 2009a).	Silt	Grasses, *Phragmites*	N/A	N/A	N/A	July 1 – March 31	Low
SIXTEEN MILE CREEK WATERSHED - EAST SIXTEEN MILE CREEK SUBWATERSHED														
16-20003	Site 42: Tributary of East Sixteen Mile Creek	4821785 mN	600961 mE	Permanent	Warmwater	Direct	Fathead Minnow, Bluntnose Minnow, River Chub, Northern Hog Sucker, Common Carp, Creek Chub, Smallmouth Bass, Mimic Shiner, Common Shiner, Brown Bullhead, Yellow Bullhead, Rock Bass, Goldfish, Emerald Shiner, Northern Pike, Fantail Darter, Brook Stickleback, Largemouth Bass, Blacknose Dace, Johnny Darter, Golden Shiner, Rosyface Shiner, Bluegill, Pumpkinseed, Black Crappie, White Sucker (MNRF 2017; CH 2011). Finescale Dace, Northern Redbelly Dace (CH 2018)	Unknown	Unknown	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate
	Site 43: Tributary of East Sixteen Mile Creek			Permanent	Warmwater	Direct	Fathead Minnow, Bluntnose Minnow, River Chub, Northern Hog Sucker, Common Carp, Creek Chub, Smallmouth Bass, Mimic Shiner, Common Shiner, Brown Bullhead, Yellow Bullhead, Rock Bass, Goldfish,	Concrete (in channel from SWM ponds to east), silt, boulder	Cattails, grasses	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Emerald Shiner, Northern Pike, Fantail Darter, Brook Stickleback, Largemouth Bass, Blacknose Dace, Johnny Darter, Golden Shiner, Rosyface Shiner, Bluegill, Pumpkinseed, Black Crappie, White Sucker (MNRF 2017; CH 2011). Finescale Dace, Northern Redbelly Dace (CH 2018).							
	Site 44: Tributary of East Sixteen Mile Creek	4825561 mN	597084 mE	Permanent	Warmwater	Direct	Fathead Minnow, Bluntnose Minnow, River Chub, Northern Hog Sucker Common Carp, Creek Chub, Smallmouth Bass, Mimic Shiner, Common Shiner, Brown Bullhead, Yellow Bullhead, Rock Bass, Goldfish, Emerald Shiner, Northern Pike, Fantail Darter, Brook Stickleback, Largemouth Bass, Blacknose Dace, Johnny Darter, Golden Shiner, Rosyface Shiner, Bluegill, Pumpkinseed, Black Crappie, White Sucker (MNRF 2017; CH 2011). Finescale Dace, Northern Redbelly Dace (CH 2018)	Silt	Cattails, grasses	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate
	Site 45: Tributary of East Sixteen Mile Creek	4826650 mN	595911 mE	Intermittent	Warmwater	Direct	Fathead Minnow, Bluntnose Minnow, River Chub, Northern Hog Sucker Common Carp, Creek Chub, Smallmouth Bass, Mimic Shiner, Common Shiner, Brown Bullhead, Yellow Bullhead, Rock Bass, Goldfish, Emerald Shiner, Northern Pike, Fantail Darter, Brook Stickleback, Largemouth Bass, Blacknose Dace, Johnny Darter, Golden Shiner, Rosyface Shiner, Bluegill, Pumpkinseed, Black Crappie, White Sucker (MNRF 2017; CH 2011).	Silt	Cattails, grasses	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Finescale Dace, Northern Redbelly Dace (CH 2018)							
	Site 46: Tributary of East Sixteen Mile Creek	4827097 mN	596064 mE	Permanent	Warmwater	Indirect	Fathead Minnow, Bluntnose Minnow, River Chub, Northern Hog Sucker Common Carp, Creek Chub, Smallmouth Bass, Mimic Shiner, Common Shiner, Brown Bullhead, Yellow Bullhead, Rock Bass, Goldfish, Emerald Shiner, Northern Pike, Fantail Darter, Brook Stickleback, Largemouth Bass, Blacknose Dace, Johnny Darter, Golden Shiner, Rosyface Shiner, Bluegill, Pumpkinseed, Black Crappie, White Sucker (MNRF 2017; CH 2011). Finescale Dace, Northern Redbelly Dace (CH 2018)	Detritus, silt, muck	Cattails, *Phragmites*, grasses	Replace culvert at downstream end of channel under lane with larger one to alleviate flooding upstream and re-grade rip rap slope to remove barrier	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate
	Site 47: Tributary of East Sixteen Mile Creek	4827475 mN	596334 mE	Permanent	Warmwater	Indirect	Fathead Minnow, Bluntnose Minnow, River Chub, Northern Hog Sucker Common Carp, Creek Chub, Smallmouth Bass, Mimic Shiner, Common Shiner, Brown Bullhead, Yellow Bullhead, Rock Bass, Goldfish, Emerald Shiner, Northern Pike, Fantail Darter, Brook Stickleback, Largemouth Bass, Blacknose Dace, Johnny Darter, Golden Shiner, Rosyface Shiner, Bluegill, Pumpkinseed, Black Crappie, White Sucker (MNRF 2017; CH 2011). Finescale Dace, Northern Redbelly Dace (CH 2018)	Silt, detritus	Cattails	Grade downstream end of channel where steep rip rap slope creates barrier to fish to alleviate drop	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate
	Site 48: Tributary of East Sixteen Mile Creek	4828150 mN	597408 mE	Ephemeral	Warmwater	Indirect	Unknown	Silt	Cattails	N/A	N/A	Contributing SAR habitat (upstream of occupied Silver Shiner habitat)	July 1 - March 31	Low-Moderate

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
CREDIT RIVER WATERSHED - MULLETT CREEK SUBWATERSHED														
16-20003	Site 49: Mullet Creek	4828150 mN	598909 mE	Permanent	Warmwater	Direct	Blacknose Dace, Creek Chub (CVC 2018); Cyprinids (LGL 2018; 2019); Warmwater baitfish (MNRF 2019)	Silt, gravel, boulder, cobble	Grasses, cattails	N/A	N/A	N/A	July 1 - March 31	Low
CREDIT RIVER WATERSHED - LEVI CREEK SUBWATERSHED														
16-20003	Site 50: Levi Creek	4830441 mN	600215 mE	Permanent	Coolwater	Direct	White Sucker, Rainbow Darter, Fantail Darter, Johnny Darter, Common Shiner, Bluntnose Minnow, Blacknose Dace, Creek Chub, Northern Hog Sucker, Longnose Dace, Brown Bullhead, Golden Shiner, Stonecat, Fathead Minnow, Brassy Minnow, Rock Bass, Brook Stickleback, Pumpkinseed, Hornyhead Chub, Rainbow Trout, River Chub, Largemouth Bass (CVC 2018); Rainbow and Brown Trout (MNRF 2019); Cyprinids, Largemouth Bass (LGL 2018; 2019)	Sand, boulder, cobble, gravel, silt	Grasses	N/A	N/A	N/A	July 1 - March 31	Moderate
CREDIT RIVER WATERSHED														
16-20003	Site 51: Credit River	4831651 mN	601074 mE	Permanent	Coolwater	Direct	Rock Bass, Brown Bullhead, White Sucker, Common Carp, Rainbow Darter, Fantail Darter, Johnny Darter, Northern Hog Sucker, Common Shiner, Largemouth Bass, Stonecat, Bluntnose Minnow, Blacknose Dace, Longnose Dace, Creek Chub, Pumpkinseed, Hornyhead Chub, Brook Stickleback, River Chub,	Boulder, cobble, gravel	Grasses	N/A	Spawning habitat present, migratory salmonid corridor	N/A	July 1 - September 15	High

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
							Rainbow Trout, Chinook Salmon, Sea Lamprey, Brown Trout (CVC 2018); Cyprinids; White Sucker (LGL 2019)							
	Sites 52-54: Tributary of Credit River	4832061 mN	601340 mE	Intermittent	Warmwater	Indirect	N/A	Silt, muck, gravel	Grasses, cattails	N/A	N/A	N/A	July 1 - March 31	Low
	Site 55: Tributary of Credit River	4832657 mN	602127 mE	Ephemeral	Warmwater	Indirect	N/A	Silt	cattails	N/A	N/A	N/A	July 1 - March 31	Low
CREDIT RIVER WATERSHED - FLETCHER'S CREEK SUBWATERSHED														
16-20003	Site 56: Tributary of Fletcher's Creek	4833109 mN	602329 mE	Ephemeral	Warmwater	Indirect	N/A	Silt	Grasses	N/A	N/A	N/A	July 1 - March 31	Low
	Site 57: Tributary of Fletcher's Creek	4833539 mN	602952 mE	Ephemeral	Warmwater	Indirect	N/A	Silt	Grasses	N/A	N/A	Contributing SAR habitat (upstream of occupied Redside Dace habitat)	July 1 - March 31	Low
	Site 58: Tributary of Fletcher's Creek	4833695 mN	603066 mE	Permanent	Warmwater	Direct	White Sucker, Brook Stickleback, Common Shiner, Bluntnose Minnow, Fathead Minnow, Blacknose Dace, Creek Chub, Pumpkinseed, Hornyhead Chub, Brown Bullhead, Longnose Dace, Rainbow Darter, Fantail Darter, Johnny Darter, Brassy Minnow, Stonecat, Northern Hog Sucker, Rainbow Trout, Central Mudminnow, Largemouth Bass, Goldfish, River Chub, Chinook Salmon (CVC 2018); Cyprinids (LGL 2018; 2019)	Sand, silt, gravel, boulder	Grasses, floating-leaved	N/A	N/A	Occupied Redside Dace	July 1 - September 15	High

TABLE 3.2: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP/ PROJECT NAME	WATERBODY	LATITUDE	LONGITUDE	FLOW*	THERMAL REGIME***	FISH HABITAT	FISH SPECIES PRESENT**	SUBSTRATE TYPE*	VEGETATION*	CONSTRAINTS AND OPPORTUNITY	IMPORTANT, EXCEPTIONAL FISH HABITAT	SPECIES AT RISK / CRITICAL HABITAT PRESENT	IN WATER WORKS TIMING WINDOW***	MNRF INTERPRETATION OF SENSITIVITY
	Site 59: Tributary of Fletcher's Creek	4833736 mN	603378 mE	Ephemeral	Warmwater	Indirect	Large colony of chimney crayfish located downstream	Silt	Grasses, cattails	N/A	N/A	Contributing SAR habitat (upstream of occupied Redside Dace habitat)	July 1 - March 31	Moderate

* Data based on LGL field investigations completed during Spring/Summer of 2018 and 2019.
** Fish Point Data based on secondary source review including personal correspondence/data provided by/with the Ministry of Natural Resources and Forestry (2017a; 2019) and CVC (2018).
*** Thermal regime, in-water timing window, Species at Risk/Critical habitat and sensitivity provided by the Ministry of Natural Resources and Forestry (2017a; 2019).

3.1.6. Vegetation and Vegetation Communities

The geographical extent, composition, structure and function of vegetation communities were identified through air photo interpretation, a review of secondary source data and field investigations. Air photos were interpreted by LGL Limited to determine the limits and characteristics of the vegetation communities in the study area with the exception of the lands for which the Credit Valley Conservation Authority (CVC) and Conservation Halton (CH) provided Ecological Land Classification (ELC) data. Detailed field investigations were conducted in late spring, summer and early fall of 2018 and 2019. Investigations focused on the facility footprint, including runningway Alignment Options 1 and 2, stations and one bus storage yard, with portions of the footprint both north and south of the Highway 407 ETR (407 ETR), in order to confirm existing conditions as these relate to vegetation and vegetation communities. The vegetation communities were classified according to the Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al. 1998), to the extent possible.

VEGETATION COMMUNITIES

Vegetation communities found within the study area consist of a mixture of terrestrial, wetland and cultural communities. Forest communities identified within the study area are generally part of larger vegetation communities that extend beyond the study area, typically associated with watercourses that cross 407 ETR and the transitway lands, with a few more isolated forest patches observed on tableland. Forest and wetland communities are also associated with valley slopes (upland) and riparian habitat (bottomlands). A large portion of the study area is associated with cultural communities that contain a high proportion of invasive and non-native plant species that are disturbance tolerant. Overall, vegetation communities were observed to be in a disturbed state associated with existing land use practices; this was particularly notable along community edges. Portions of several forested communities observed were in good condition with minimal disturbance observed.

Eleven Ecological Land Classification (ELC) ecosites were identified within the study area. These communities include Coniferous Forest (FOC), Deciduous Forests (FOD), Mineral Cultural Woodlands (CUW1), Deciduous Plantations (CUP1), Mineral Cultural Meadows (CUM1), Mineral Cultural Thickets (CUT1), Mineral Meadow Marshes (MAM2), Mineral Shallow Marshes (MAS2), Swamp Thicket (SWT), Deciduous Swamps (SWD), and Open Aquatic (OAO).

Thirty vegetation communities were identified within the study area based on field surveys undertaken by LGL staff throughout the spring, summer and fall of 2018 and 2019. Field surveys were undertaken on June 18, July 13 and 20, and August 3, 2018, and June 3, 11, July 3, 10, 12, 15, 16, 26, 31, and August 7, 8, 2019. The communities identified include numerous combined vegetation communities including Mineral Cultural Meadow/Mineral Cultural Thicket (CUM1-1/CUT1), Mineral Cultural Thicket/Mineral Cultural Woodland (CUT1/CUW1), Mineral Meadow Marsh/Mineral Shallow Marsh (MAM2/MAS2) and Mineral Shallow Marsh/Mineral Swamp Thicket (MAS2/SWT2). These communities were either very small and/or boundaries were difficult to distinguish often because communities were in successional transition (i.e., changes in species structure within an ecological community made it difficult to identify or define a hard boundary). The range of vegetation communities present within the study area includes several Deciduous Forests (FOD) and a Coniferous Forest (FOC). Wetland communities were also observed including Mineral Meadow Marsh (MAM2), Reed-Canary Grass Mineral Meadow Marsh (MAM2-2), Forb Mineral Meadow Marsh (MAM2-10), Mineral Shallow Marsh (MAS2), Cattail Mineral Shallow Marsh (MAS2-1), Forb Mineral Shallow Marsh (MAS2-9), Willow Mineral Thicket Swamp (SWT2-2), Green Ash Mineral Deciduous Swamp (SWD2-2), Maple Mineral Deciduous Swamp (SWD3), and a Willow Mineral Deciduous Swamp (SWD4-1).

Several Mineral Open Bluff (BLO1) areas were observed associated with Bronte Creek and Sixteen Mile Creek. Cultural community types were also identified including Dry-Moist Old Field Meadow (CUM1-1), Mineral Cultural Thicket (CUT1), Sumac Cultural Thicket (CUT1-1), Gray Dogwood Cultural Thicket (CUT1-4), Mineral Cultural Woodland (CUW1), Deciduous Plantation (CUP1), and a Black Walnut Deciduous Plantation (CUP1-3). Numerous very small wetland patches, typically less than 0.1 to 0.2 ha and dominated by common reed (*Phragmites australis*), were identified as inclusions within cultural meadow communities identified adjacent to the 407 ETR. Many of these inclusions were very dry in 2018 and 2019, and likely established due to seasonal runoff from the 407 ETR.

The Fresh-Moist Sugar Maple-Black Maple Deciduous Forest (FOD6-4) associated with Bronte Creek, is a vulnerable community type provincially ranked as S3. This community contained several regionally rare species.

Several areas observed not identified as ELC vegetation communities included manicured areas, hedgerows and storm water ponds. Manicured areas (M) include mown lawns, gardens and planted trees. A few of the berms surrounding storm water ponds were observed to either have been planted with a low density of shrubs and trees or these have colonized naturally, and ground flora within these areas were comprised of disturbance tolerant species typically found within the surrounding landscape. Common reed and/or cattails (*Typha* sp.) were observed to have established as dominant along the water's edge in most storm water ponds. Hedgerows (H) include planted trees or linear strips of trees that have been maintained for the purposes of preserving windbreaks between agricultural fields and screening between residential areas and local roads.

There were several instances across the study area where sites could only be surveyed partially along an edge from within the right-of-way (ROW) where access was not permitted, or areas were gated and access was not possible. Plant lists presented on the data sheets, presented in **Appendix E** (Terrestrial Ecosystems Existing Conditions and Impact Assessment Report) of this EPR, represent the fullest plant list possible based on full or limited property access. Where possible, plant lists were augmented through secondary source information. It should also be noted that where ash (*Fraxinus* sp.) trees were identified, these were typically in poor condition or dead due to the effects of Emerald Ash Borer (*Argrilus planipennis*). The ELC vegetation communities identified during field surveys undertaken by LGL staff are described in **Table 3.3** and presented in **Figures 3.2a** to **3.2f** which includes the runningway for both Alignment Options 1 and 2, and transitway stations and bus storage yard Options A and B, where two options were identified.

TABLE 3.3: SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
TERRESTRIAL – NATURAL/SEMI-NATURAL			
BLO	**Open Bluff**		
BLO1	Mineral Open Bluff	**Ground Cover:** examples include swallow-wort (*Cynanchum rossicum*), Canada goldenrod (*Solidago canadensis*), and garlic mustard (*Alliaria petiolata*).	• Tree cover ≤ 10% (BL). • Tree cover ≤25%, shrub cover ≤ 25% (O). • Mineral soils (1). • Plant cover restricted by erosion related disturbances. Vegetation cover varies from patchy and barren to continuous herbaceous and shrub cover.
FOC	**Coniferous Forest**		
FOC2-2	Dry-Fresh White Cedar Coniferous Forest	**Canopy:** dominated by eastern white cedar (*Thuja occidentalis*). Includes white pine (*Pinus strobus*) and Manitoba maple (*Acer negundo*). **Understorey:** includes eastern white cedar, white pine, and Manitoba maple. **Ground Cover:** examples include swallow-wort (*Cynanchum rossicum*), Canada goldenrod (*Solidago canadensis*), and garlic mustard (*Alliaria petiolata*).	• Tree cover > 60% (FO). • Coniferous trees > 75% of canopy cover (C). • Soil moisture dry to fresh. • Upper to middle slopes and tableland.
FOD	**Deciduous Forest**		
FOD2-4a - b	Dry-Fresh Oak-Hardwood Deciduous Forest	**Canopy:** includes red oak, shagbark hickory, sugar maple and basswood. **Understorey:** includes sugar maple, shagbark hickory, red ash, (*Fraxinus pennsylvanica*), black walnut (*Juglans nigra*), ironwood (*Ostrya virginiana*), chokecherry and red raspberry (*Rubus idaeus*). **Ground Cover:** includes herb robert, enchanter's nightshade, Canada anemone (*Anemone canadensis*), and pointed broom sedge (*Carex scoparia*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Oak species dominant (2). Oak dominant with Sugar Maple, ash, beech, basswood associates (-4).
FOD5a - b	Dry-Fresh Sugar Maple Deciduous Forest	**Canopy:** includes shagbark hickory, black ash (*Fraxinus nigra*), sugar maple, black walnut, American beech (*Fagus grandifolia*) and eastern cottonwood (*Populus deltoides*). **Understorey:** includes Manitoba maple, black walnut, basswood, American beech, sugar maple, common buckthorn and staghorn sumac (*Rhus typhina*). **Ground Cover:** includes Canada goldenrod, enchanter's nightshade, sugar maple, shagbark hickory and riverbank grape.	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with Beech, Oaks, Ironwood, Basswood, Hickory, Aspen associates (5). Heavily managed, grazed or disturbed sites.
FOD5-1a – b	Dry-Fresh Sugar Maple Deciduous Forest	**Canopy:** includes sugar maple, red oak, shagbark hickory and black cherry (*Prunus serotina*). **Understorey:** includes sugar maple, red ash, American beech, and alleghany blackberry (*Rubus allegheniensis*). **Ground Cover:** includes sugar maple, red ash, coltsfoot (*Tussilago farfara*), small jack-in-the-pulpit (*Arisaema triphyllum* ssp. *triphyllum*), zig-zag goldenrod (*Solidago flexicaulis*), herb robert, and garlic mustard (*Alliaria petiolata*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with Beech, Oaks, Ironwood, Basswood, Hickory, Aspen associates (5). • Almost entirely dominated by Sugar Maple (-1).
FOD5-2	Dry-Fresh Sugar Maple –Beech Deciduous Forest Type	**Canopy:** includes sugar maple, shagbark hickory, red oak, and Freeman's maple (*Acer X freemanii*). **Understorey:** sugar maple, shagbark hickory, chokecherry, red ash, and scarlet hawthorn (*Crataegus pedicellata*). **Ground Cover:** includes poison ivy (*Rhus radicans* ssp. *negundo*), sugar maple, enchanter's nightshade, garlic mustard and yellow avens (*Geum aleppicum*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with Beech, Oaks, Ironwood, Basswood, Hickory, Aspen associates (5). Almost entirely dominated by Sugar Maple with Beech (-2).

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
FOD5-3a – e	Dry Fresh Sugar Maple-Oak Deciduous Forest	**Canopy:** includes red oak, white oak (*Quercus alba*), sugar maple, shagbark hickory, and basswood. **Understorey:** includes shagbark hickory, sugar maple, white ash, common buckthorn, chokecherry, and gray dogwood (*Cornus foemina* ssp. *racemosa*). **Ground Cover:** includes enchanter's nightshade, yellow avens, false Solomon's seal (*Maianthemum racemosum*), and Pennsylvania sedge (*Carex pennsylvanica*), zig-zag goldenrod, Virginia stickweed (*Hackelia virginiana*), and inserted Virginia-creeper (*Parthenocissus inserta*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with Beech, Oaks, Ironwood, Basswood, Hickory, Aspen associates (5). Sugar Maple with Red Oak >> White Oak (-3).
FOD5-5	Dry-Fresh Sugar Maple Hickory Deciduous Forest	**Canopy:** includes shagbark hickory, red oak, basswood and sugar maple. **Understorey:** includes shagbark hickory, sugar maple, red ash, ironwood, common buckthorn, chokecherry and gray dogwood. **Ground Cover:** includes shagbark hickory, sugar maple, red ash, Canada goldenrod, poison ivy, and riverbank grape.	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with Beech, Oaks, Ironwood, Basswood, Hickory, Aspen associates (5). Sugar Maple with Hickory (-5).
FOD6-2	Fresh-Moist Sugar Maple-Black Maple Deciduous Forest	**Canopy:** includes sugar maple, black maple, red ash, red maple (*Acer rubrum*), and American beech. **Understorey:** includes sugar maple, basswood, black maple, red ash and wild black currant (*Ribes americanum*). **Ground Cover:** enchanter's nightshade, false nettle (*Boehmeria cylindrical*), pale touch-me-not (*Impatiens pallida*), ostrich fern (*Matteuccia struthiopteris* var. *pennsylvanica*), garlic mustard, and hog peanut (*Amphicarpaea bracteata*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with ash, red maple, white elm, yellow birch, basswood and beech associates (6). • Black Maple present (-2). Moist well drained sites, often along floodplains.
FOD6-4	Fresh-Moist Sugar Maple-White Elm Deciduous Forest	**Canopy:** includes sugar maple, white elm (*Ulmus americana*), green ash, shagbark hickory and Manitoba maple. **Understorey:** includes common buckthorn and green ash. **Ground Cover:** river bank grape (*Vitis riparia*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Sugar maple with ash, red maple, white elm, yellow birch, basswood and beech associates (6). • White elm present (-4). Moist well drained sites, often along floodplains.
FOD7-2a – b	Fresh-Moist Ash Lowland Deciduous Forest	**Canopy:** includes red ash, black ash, black walnut, sugar maple and red oak. **Understorey:** includes red ash, sugar maple, staghorn sumac and bur oak. **Ground Cover:** includes broad-leaved reed grass (*Cinna latifolia*), enchanter's nightshade, Pennsylvania sedge, inserted Virginia-creeper, reed-canary grass and Canada goldenrod.	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Elms, Willows, Black Walnut, Black Maple Basswoods dominate separately or in variable mixtures (7). Ash dominant (-2).
FOD7-3a – b	Fresh-Moist Willow Lowland Deciduous Forest	**Canopy:** includes silver maple (*Acer saccharinum*), eastern cottonwood, crack willow (*Salix fragilis*), Manitoba maple, and sycamore (*Platanus occidentalis*). **Understorey:** includes common buckthorn, staghorn sumac, Manitoba maple, tartarian honeysuckle (*Lonicera tatarica*), and riverbank grape. **Ground Cover:** includes inserted Virginia-creeper, riverbank grape, goldenrods (*Solidago* sp.), Canada rush (*Juncus canadensis*), and wild teasel.	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Elms, Willows, Black Walnut, Black Maple Basswoods dominate separately or in variable mixtures (7). • Willow dominant (-3). • Resulting from cultural influences (i.e., historical clearing and planting or other disturbances. Typically associated with riparian zones.
TERRESTRIAL – CULTURAL			
CUM	**Cultural Meadow**		
CUM1-1 (a-l)	Dry-Moist Old Field Meadow	**Emergent Trees/Shrubs:** includes black walnut, black locust (*Robinia pseudo-acacia*), hybrid willow (*Salix X pendulina*), Manitoba maple, sugar maple, red ash, Norway and Colorado spruce (*Picea abies* and *P. pungens*), white pine (*Pinus strobus*), Russian olive (*Elaeagnus angustifolia*), tartarian honeysuckle, hawthorn (*Crataegus* spp.), riverbank grape, and common buckthorn. **Ground Cover:** includes smooth brome (*Bromus inermis*), red fescue (*Festuca rubra* ssp. *rubra*) clovers (*Trifolium* spp.), bluegrasses (*Poa* spp.), orchard grass (*Dactylis glomerata*), reed-canary grass, common reed (*Phragmites australis*), wild teasel, and New England aster (*Aster novae-angliae*).	• Cultural communities (CU). • Tree cover and shrub cover < 25% (M). • Mineral soil (1). • This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1).

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
CUT1	**Cultural Thicket**		
CUT1a - e	Mineral Cultural Thicket	**Emergent:** includes trembling aspen, red oak, bur oak, basswood, and Manitoba maple. **Understory:** includes common buckthorn, gray dogwood, staghorn sumac, scarlet hawthorn, willows, sugar maple and American ash. **Ground Cover:** includes Canada goldenrod, smooth brome, orchard grass, bluegrasses, asters (*Symphyotrichum* sp.), thistles (*Cirsium arvense* and *C. vulgare*), bird's-foot trefoil (*Lotus corniculata*), and field sow-thistle (*Sonchus arvensis*).	• Cultural community (CU). • Tree cover <25%; shrub cover >25% (T). • Mineral soil (1).
CUT1-1	Sumac Cultural Thicket	**Understorey:** includes staghorn sumac and red ash. **Ground Cover:** includes smooth brome, daisy fleabane (*Erigeron annuus*), ox-eye daisy (*Chrysanthemum leucanthemum*) and garlic mustard.	• Cultural community (CU). • Tree cover <25%; shrub cover >25% (T). • Mineral soil (1). • Sumac dominates (-1).
CUT1-4a – c	Gray Dogwood Cultural Thicket	**Emergent:** includes red oak, bur oak, and red ash. **Understorey:** dominated by gray dogwood, includes scarlet hawthorn, common buckthorn, red raspberry, and riverbank grape. **Ground Cover:** includes smooth brome, bluegrasses, reed canary grass (*Phalaris arundinacea*), perfoliate thoroughwort (*Eupatorium perfoliatum*), tufted vetch (*Vicia cracca*), Canada thistle, white clover (*Trifolium repens*), Canada goldenrod, giant goldenrod (*Solidago gigantea*).	• Cultural community (CU). • Tree cover <25%; shrub cover >25% (T). • Mineral soil (1). • Gray Dogwood dominates (-1).
CUM1-1a/CUT1a to CUM1-1c/ CUT1c	Mineral Cultural Meadow/Mineral Cultural Thicket	**Emergent:** includes black walnut, eastern cottonwood, shagbark hickory, sugar maple and Austrian pine (*Pinus nigra*). **Understorey:** includes Manitoba maple, black walnut, red ash, trembling aspen, common buckthorn, staghorn sumac, and Russian olive. **Ground Cover:** includes reed-canary grass, common reed, Canada goldenrod, purple loosestrife (*Lythrum salicaria*), common wormwood (*Artemisia absinthium*), glandular touch-me-not (*Impatiens glandulifera*), Indian hemp (*Apocynum cannabinum* var. *cannabinum*), common St. John's-wort (*Hypericum perforatum*) and riverbank grape.	• Cultural communities (CU). • Tree cover and shrub cover < 25% (M). • Tree cover <25%; shrub cover >25% (T). • Mineral soil (1). These communities can occur on a wide range of soil moisture regimes (Dry-Moist) (-1).
CUW	**Cultural Woodland**		
CUW1a – j	Mineral Cultural Woodland	**Canopy:** includes black walnut, sugar maple, shagbark hickory, bur oak, black locust, and Manitoba maple. **Understorey:** includes common buckthorn, black walnut, bur oak, red ash, Manitoba maple, black locust, and riverbank grape. **Ground Cover:** includes reed canary grass, riverbank grape, Canada goldenrod, red ash, common ragweed (*Ambrosia artemisiifolia*), horseweed (*Conyza canadensis*), and smooth brome.	• Cultural communities (CU). • 35% < tree cover ≤ 60% (W). • Mineral Soil (1).
CUT1/ CUW1	Mineral Cultural Thicket/Mineral Cultural Woodland	**Canopy:** examples include white elm, Manitoba maple, sugar maple, black walnut and basswood. **Understorey:** examples include common buckthorn, honeysuckles, Manitoba maple and black walnut. **Ground Cover:** includes smooth brome, bluegrasses, Canada goldenrod, and wild carrot (*Daucus carota*).	• Cultural communities (CU). • Tree cover <25%; shrub cover >25% (T). • 35% < tree cover ≤ 60% (W). • Mineral soil (1).
WETLAND			
MAM	**Meadow Marsh**		
MAM2	Mineral Meadow Marsh	**Emergent**: includes common buckthorn. **Ground cover**: dominated by reed-canary grass and included wild parsnip (*Pastinaca sativa*) and calico aster (*Aster lateriflorus* var. *lateriflorus*).	• Tree or shrub cover <25% (MA). • Flooding seasonal, species less tolerant of prolonged flooding (M).

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
MAM2-2a – n	Reed-canary Grass Mineral Meadow Marsh	**Emergent**: includes common buckthorn. **Ground cover**: dominated by reed-canary grass and included wild parsnip (*Pastinaca sativa*) and calico aster (*Aster lateriflorus* var. *lateriflorus*).	• Tree or shrub cover <25% (MA). • Flooding seasonal, species less tolerant of prolonged flooding (M). • Mineral soil (2). • Reed-canary grass dominant (-2).
MAM2-10	Forb Mineral Meadow Marsh	**Emergent**: includes European black alder (*Alnus glutinosa*) willows, and tartarian honeysuckle. **Ground cover**: includes spotted joe-pye-weed (*Eupatorium maculatum* ssp. *maculatum*), purple loosestrife, spotted touch me not, spotted water-hemlock (*Cicuta maculate*), and reed canary grass. **Floating-leaved and submerged macrophytes (inclusion):** a few floating plants were also observed as rare to occasional and includes common water-plantain (*Alisma plantago-aquatica*) and broad-leaved arrowhead (*Sagittaria latifolia*).	• Tree or shrub cover <25% (MA). • Flooding seasonal, species less tolerant of prolonged flooding (M). • Mineral soil (2). • Forbs are dominant (-10).
MAS	**Shallow Marsh**		
MAS2a-b	Mineral Shallow Marsh	**Emergent:** includes white willow, Manitoba maple, black walnut, eastern white cedar, common buckthorn, gray dogwood and red-osier dogwood. **Ground cover**: includes common reed, reed canary grass, narrow-leaved cattail (*Typha angustifolia*), purple loosestrife, and common milkweed (*Asclepias syriaca*).	• Tree or shrub cover ≤25% (MA). • Water up to 2 m deep, with standing or flowing water for much of the growing season (S). • Mineral soil (2). • Dominated by emergent hydrophytic macrophytes.
MAS2-1a - m	Cattail Mineral Shallow Marsh	**Emergent:** includes crack willow, Freeman's maple, silver maple and white elm. **Understory**: includes white elm and common buckthorn. **Ground cover**: dominated by cattails (*Typha anugstifolia* and *T. latifolia*), includes reed canary grass, purple loosestrife, common reed, wild teasel, rough-fruited cinquefoil (*Potentilla recta*), and blue vervain.	• Tree or shrub cover ≤25% (MA). • Water up to 2 m deep, with standing or flowing water for much of the growing season (S). • Mineral soil (2). • Cattails are dominant (-1). • Dominated by emergent hydrophytic macrophytes.
MAS2-9	Forb Mineral Shallow Marsh	**Ground cover**: American great bulrush (*Scirpus validus*), rush (*Juncus* sp.), cut-leaved water-horehound (*Lycopus americanus*), mouse-ear scorpion grass (*Myosotis scorpioides*), and spotted touch me not (*Impatiens capensis*). **Floating-leaved and submerged macrophytes (inclusion):** a few floating plants were also observed as rare to occasional and includes common water-plantain (*Alisma plantago-aquatica*) and common floating pondweed (*Potamogeton natans*).	• Tree or shrub cover ≤25% (MA). • Water up to 2 m deep, with standing or flowing water for much of the growing season (S). • Mineral soil (2). • Forbs are dominant (-9). • Dominated by emergent hydrophytic macrophytes.
MAS2a/MAM2a– MAS2c/MAM2c	Mineral Shallow Marsh/Mineral Meadow Marsh	**Emergent:** includes willows, Manitoba maple, red ash and common buckthorn. **Ground cover**: includes reed canary grass, common reed, and purple loosestrife.	• Tree or shrub cover ≤25% (MA). • Water up to 2 m deep, with standing or flowing water for much of the growing season (S). • Flooding seasonal, species less tolerant of prolonged flooding (M). • Mineral soil (2). • Dominated by emergent hydrophytic macrophytes.
MAS2-1/SWT2	Cattail Mineral Shallow Marsh/Mineral Thicket Swamp	**Emergent:** includes willows and red ash. **Understory**: includes sandbar willow (*Salix exigua*), pussy willow (*Salix discolor*), and red ash. **Ground cover**: includes narrow-leaved cattail and broad-leaved cattail (*Typha latifolia*), reed canary grass, purple loosestrife.	• Tree or shrub cover ≤25% (MA). • Water up to 2 m deep, with standing or flowing water for much of the growing season (S). • Cattails are dominant (-1). • Dominated by emergent hydrophytic macrophytes. • Tree or shrub cover > 25% with variable flooding regimes (SW). • Tree cover ≤ 25%; hydrophytic shrubs >25% (T). • Mineral soil (2).
SWT			

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
SWT2-2	Willow Mineral Thicket Swamp	**Emergent:** includes Freeman's maple, white elm and Manitoba maple. **Understory**: includes Missouri willow, Manitoba maple, black walnut, and white elm. **Ground cover**: includes purple loosestrife, path rush (*Juncus tenuis*), awl-fruited sedge (*Carex stipata*) and black-eyed Susan (*Rudbeckia hirta*).	• Tree or shrub cover >25% and dominated by hydrophytic shrub and tree species (SW). • Deciduous tree cover ≤25%; hydrophytic shrubs > 25% (T). • Mineral soil (2). • Willows are dominant (-2).
SWD			
SWD2-2a - c	Green Ash Mineral Deciduous Swamp	**Canopy:** includes red ash and Manitoba maple. **Understory**: includes red ash, Manitoba maple, common buckthorn. **Ground cover**: includes reed canary grass.	• Tree or shrub cover >25% and dominated by hydrophytic shrub and tree species (SW). • Deciduous tree cover >75% of canopy cover (D). • Mineral soils and Ash dominant (2). • Green Ash is dominant (-2).
SWD3	Maple Mineral Deciduous Swamp	**Canopy:** includes silver maple, white willow, Manitoba maple, and trembling aspen. **Understory**: includes sandbar willow, pussy willow, Manitoba maple, red-osier dogwood, and fragrant sumac (*Rhus aromatica*). **Ground cover**: includes spotted touch-me-not, giant goldenrod, garlic mustard, Canada goldenrod, and field sow-thistle.	• Tree or shrub cover >25% and dominated by hydrophytic shrub and tree species (SW). • Deciduous tree cover >75% of canopy cover (D). • Mineral soils and Maple dominant (3).
SWD4-1a - b	Willow Mineral Deciduous Swamp	**Canopy:** includes willows, eastern cottonwood, black locust and basswood. **Understory**: includes willows, round-leaved dogwood (*Cornus rugosa*), red-osier dogwood, common buckthorn and black locust. **Ground cover**: includes common reed, reed canary grass, cattails, wild carrot, Canada bluegrass (*Poa compressa*), blue vervain and purple loosestrife.	• Tree or shrub cover >25% and dominated by hydrophytic shrub and tree species (SW). • Deciduous tree cover >75% of canopy cover (D). • Mineral soils and less common associates of willow, white elm, birch and aspen (4). • Willows dominant (-1).
OAO	**Open Aquatic**		
OAO	Open Aquatic		• Water depth >2 m (O). • No macrophyte vegetation, no tree or shrub cover (A). • Plankton dominated (O).
OTHER**			
Planted	**Manicured and Hedgerow**		
M and H	Manicured grasses and planted shrubs and/or trees	Areas where large expanses of grass/shrubs/trees are maintained and/or planted. **Planted/established trees/shrubs:** includes sugar maple, red ash, red oak, black walnut, eastern cottonwood, hybrid willow, Norway maple (*Acer platanoides*), silver variegated dogwood (*Cornus alba 'elegantissima*'), Japanese Yew (*Taxus cuspidata*), Japanese knotweed (*Polygonum cuspidatum*), shagbark hickory, eastern white cedar, Colorado spruce, Norway spruce, and scotch pine (*Pinus sylvestris*), hawthorns (*Crataegus* spp.), honeysuckles (*Lonicera* spp.), staghorn sumac, and common buckthorn. **Grasses**: includes bluegrasses, smooth brome, reed-canary grass, Canada goldenrod, garlic mustard, yellow avens, thistles.	

*Not identified by the ELC.

FIGURE 3.2A: 407 TRANSITWAY WEST – NATURAL HERITAGE EXISTING CONDITIONS

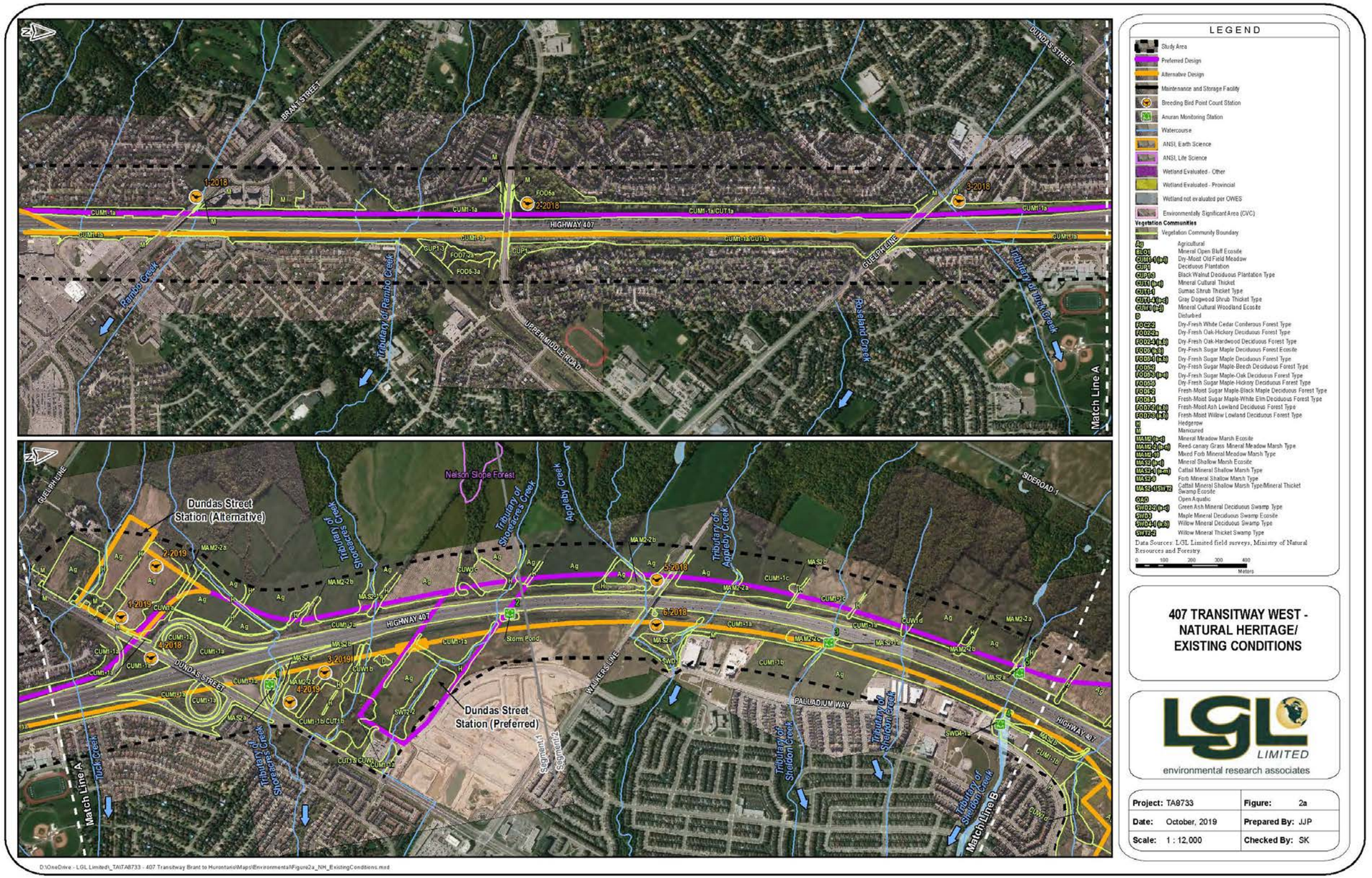


FIGURE 3.2B: 407 TRANSITWAY WEST – NATURAL HERITAGE EXISTING CONDITIONS

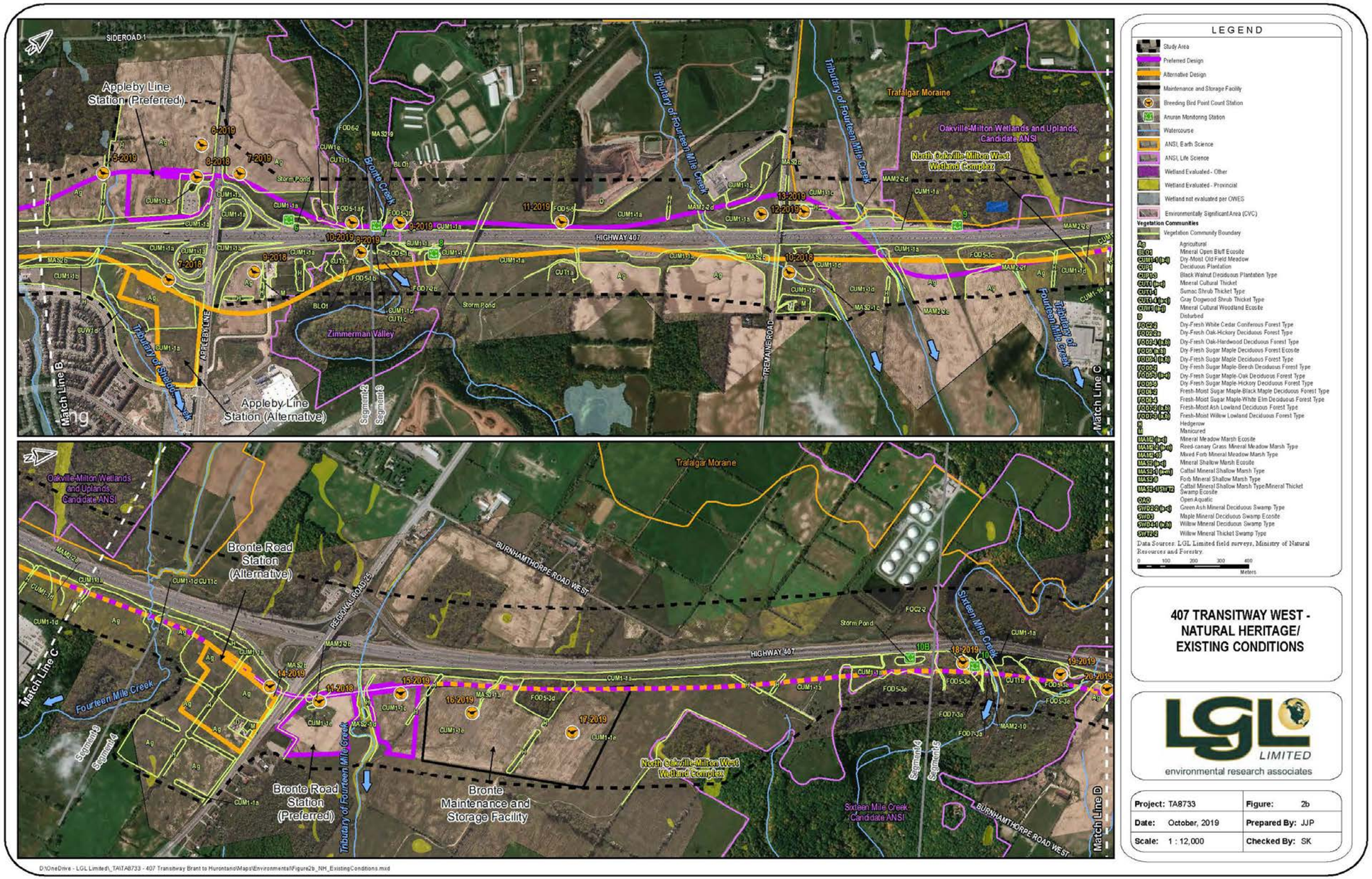


FIGURE 3.2C: 407 TRANSITWAY WEST – NATURAL HERITAGE EXISTING CONDITIONS

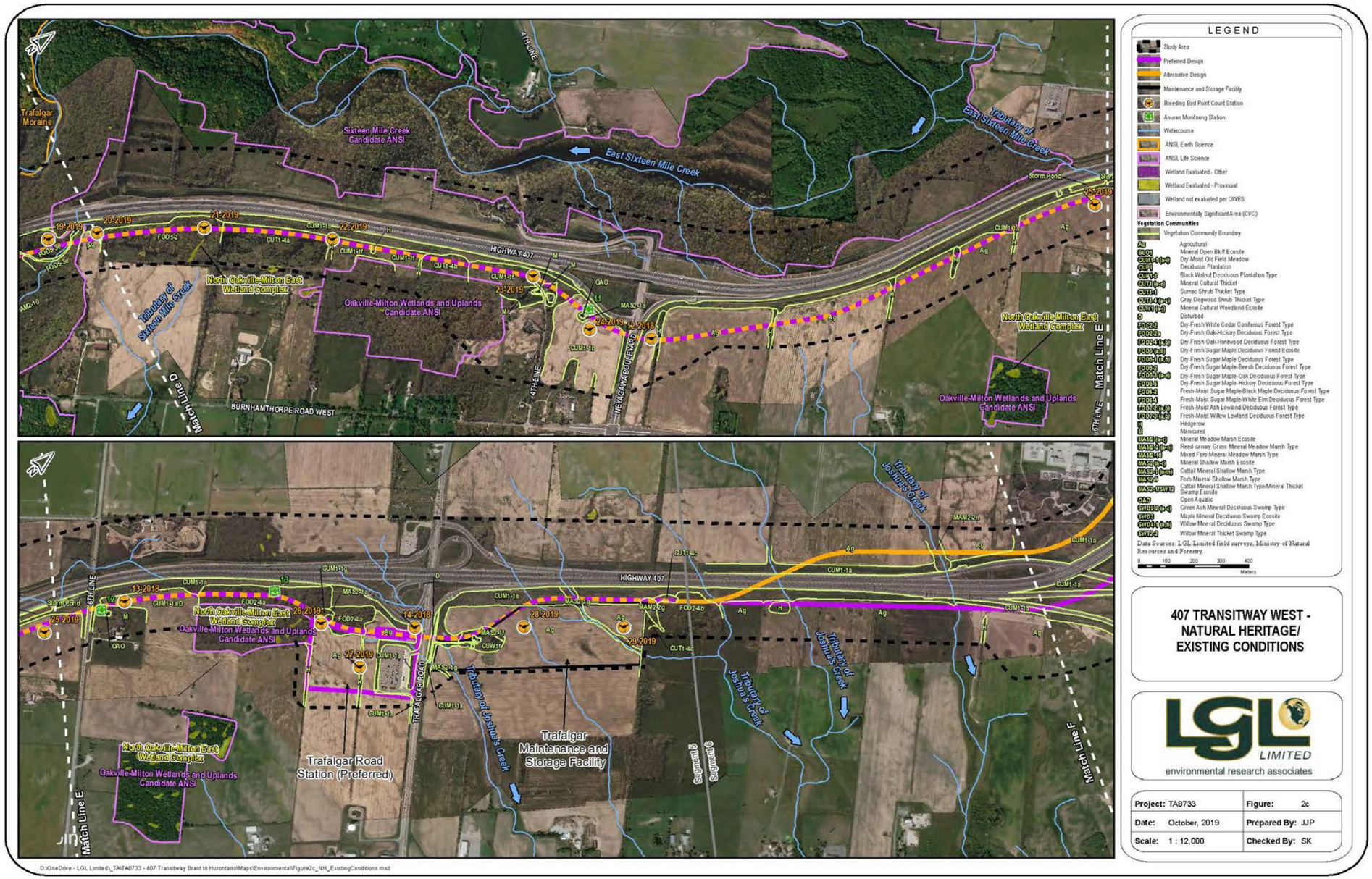


FIGURE 3.2D: 407 TRANSITWAY WEST – NATURAL HERITAGE EXISTING CONDITIONS

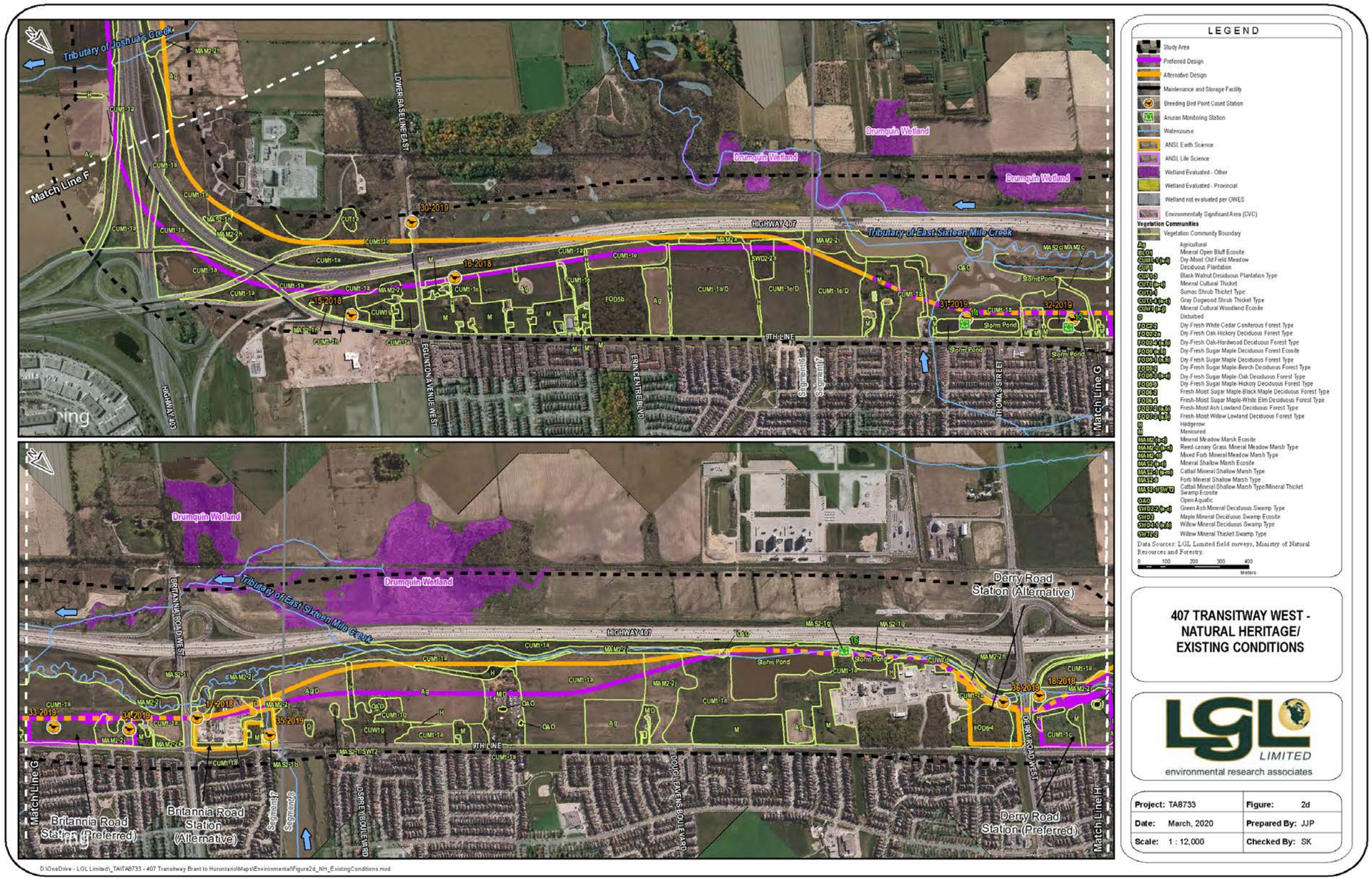


FIGURE 3.2E: 407 TRANSITWAY WEST – NATURAL HERITAGE EXISTING CONDITIONS

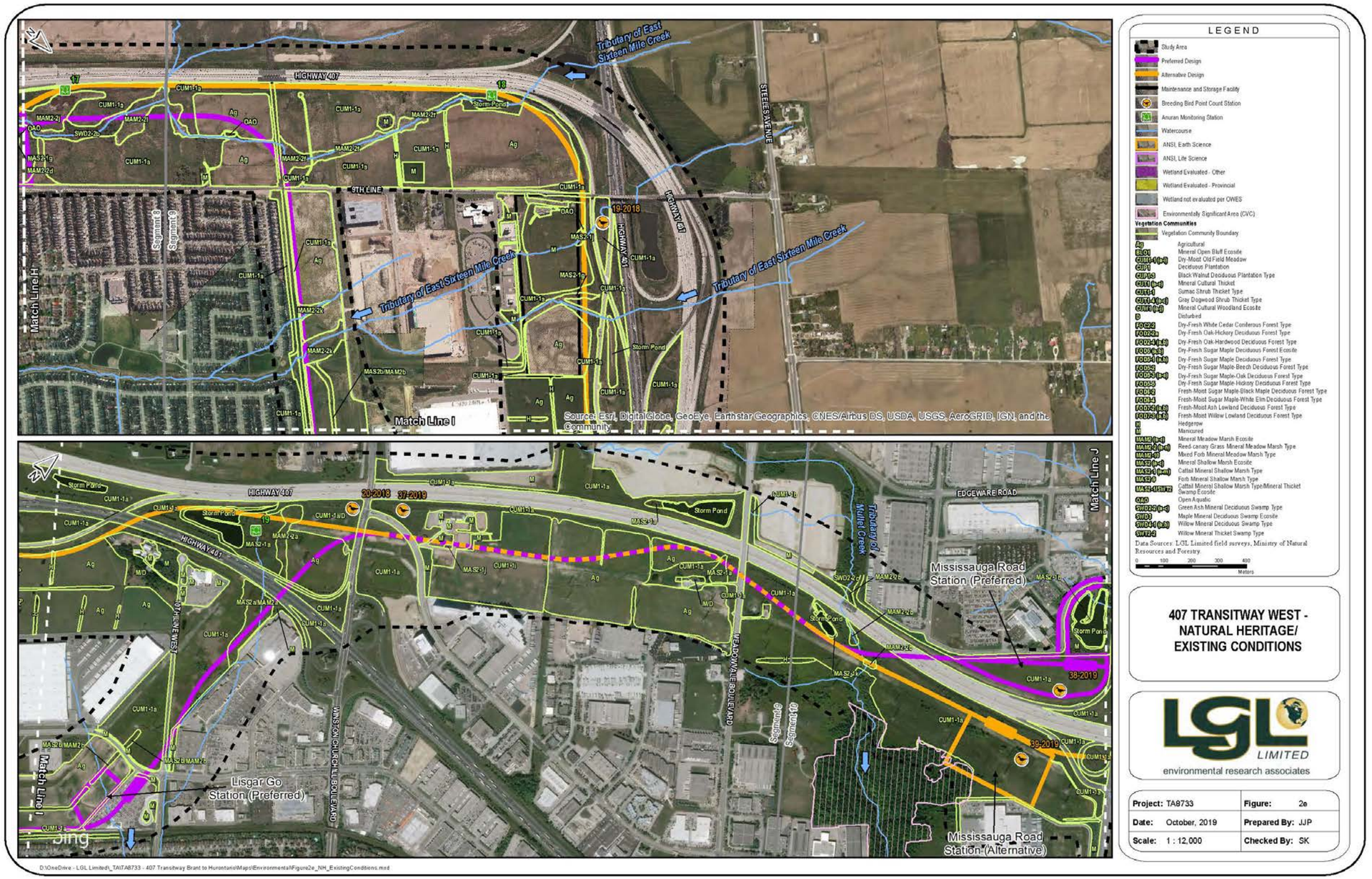
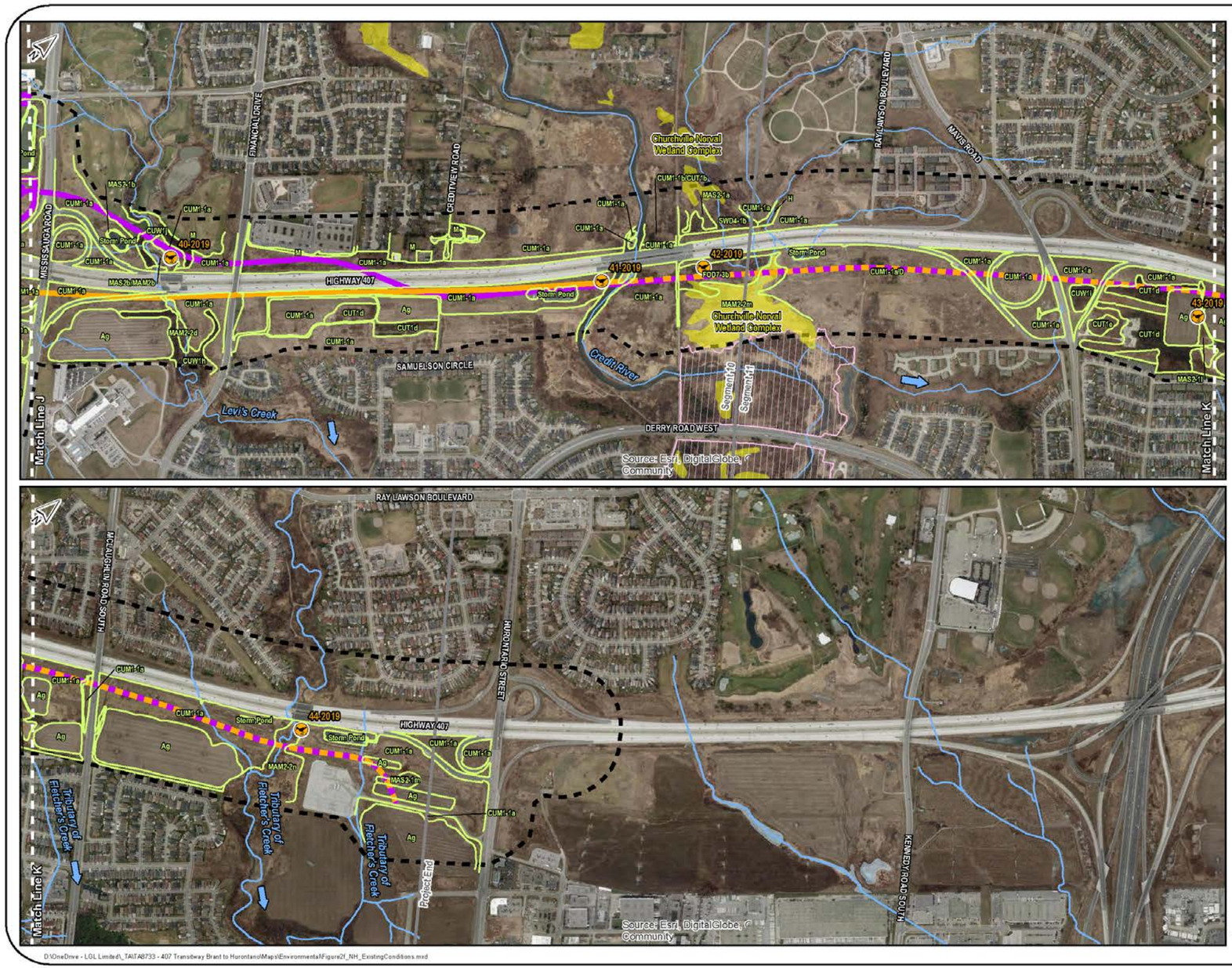


FIGURE 3.2F: 407 TRANSITWAY WEST – NATURAL HERITAGE EXISTING CONDITION



LEGEND

- Study Area
- Preferred Design
- Alternative Design
- Maintenance and Storage Facility
- Breeding Bird Point Count Station
- Anuran Monitoring Station
- Watercourse
- ANSI, Earth Science
- ANSI, Life Science
- Wetland Evaluated - Other
- Wetland Evaluated - Provincial
- Wetland not evaluated per OWES
- Environmentally Significant Area (CVC)

Vegetation Communities

- Vegetation Community Boundary
- Ag — Agricultural
- BLO1 — Mineral Open Bluff Ecosite
- CUH1-1 (s4) — Dry-Moist Old Field Meadow
- CUP3 — Deciduous Plantation
- CUP3-5 — Black Walnut Deciduous Plantation Type
- CUT1 (s4) — Mineral Cultural Thicket
- CUT1-1 — Sumac Shrub Thicket Type
- CUT1-4 (s4) — Gray Dogwood Shrub Thicket Type
- CUW1 (s4) — Mineral Cultural Woodland Ecosite
- D — Disturbed
- FOD2-2 — Dry-Fresh White Cedar Coniferous Forest Type
- FOD2-4 — Dry-Fresh Oak-Hickory Deciduous Forest Type
- FOD2-4 (s4) — Dry-Fresh Oak-Hardwood Deciduous Forest Type
- FOD5 (s4) — Dry-Fresh Sugar Maple Deciduous Forest Ecosite
- FOD5-1 (s4) — Dry-Fresh Sugar Maple Deciduous Forest Type
- FOD5-2 — Dry-Fresh Sugar Maple-Beech Deciduous Forest Type
- FOD5-3 (s4) — Dry-Fresh Sugar Maple-Oak Deciduous Forest Type
- FOD5-5 — Dry-Fresh Sugar Maple-Hickory Deciduous Forest Type
- FOD6-2 — Fresh-Moist Sugar Maple-Black Maple Deciduous Forest Type
- FOD6-4 — Fresh-Moist Sugar Maple-White Elm Deciduous Forest Type
- FOD7-2 (s4) — Fresh-Moist Ash Lowland Deciduous Forest Type
- FOD7-3 (s4) — Fresh-Moist Willow Lowland Deciduous Forest Type
- H — Hedgerow
- M — Manicured
- MAM2 (s4) — Mineral Meadow Marsh Ecosite
- MAM2-2 (s4) — Reed-canary Grass Mineral Meadow Marsh Type
- MAM2-10 — Mixed Forb Mineral Meadow Marsh Type
- MAS2 (s4) — Mineral Shallow Marsh Ecosite
- MAS2-1 (cat) — Cattail Mineral Shallow Marsh Type
- MAS2-9 — Forb Mineral Shallow Marsh Type
- MAS2-1/SWT2 — Cattail Mineral Shallow Marsh Type/Mineral Thicket Swamp Ecosite
- OAO — Open Aquatic
- SWD2-3 (s4) — Green Ash Mineral Deciduous Swamp Type
- SWD3 — Maple Mineral Deciduous Swamp Ecosite
- SWD4-1 (s4) — Willow Mineral Deciduous Swamp Type
- SWT2-4 — Willow Mineral Thicket Swamp Type

Data Sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry

0 100 200 300 400 Meters

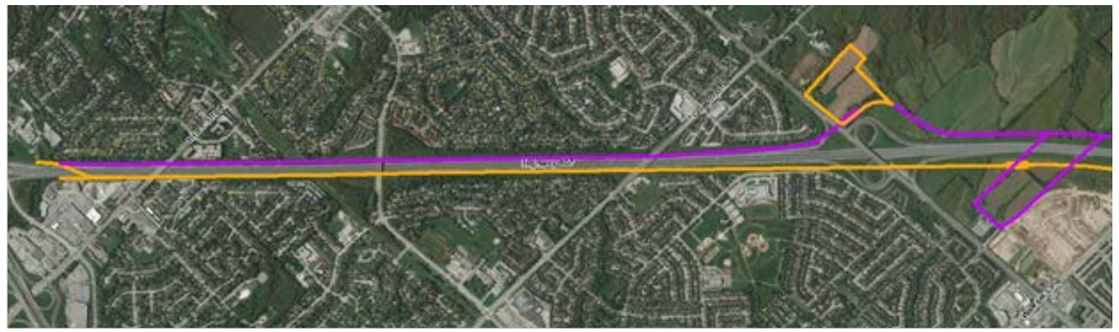
407 TRANSITWAY WEST - NATURAL HERITAGE/ EXISTING CONDITIONS

LGL LIMITED
environmental research associates

Project:	TA8733	**Figure:**	2f
Date:	March, 2020	**Prepared By:**	JJP
Scale:	1 : 12,000	**Checked By:**	SK

The ELC Field Sheets and the photographic record of the vegetation communities is presented in **Appendix E** of this EPR. Figures presented below for each Segment illustrate the runningway, stations and the bus storage yard for Alignment Option 1, shown in purple, and Alignment Option 2, shown in orange.

SEGMENT S1: WEST OF BRANT STREET TO EAST OF DUNDAS STREET



Alignment Option 1

Cultural communities dominate the area associated with Alignment Option 1 north of the 407 ETR, and several small and isolated wetlands typically associated with highway drainage or associated with local tributaries, are present. The cultural meadow and cultural meadow/cultural thicket communities east of Brant Street, which extend across Option 1, are dominated by non-native and/or disturbance tolerant plant species. These species include bird's-foot trefoil (*Lotus corniculatus*), horseweed (*Conyza canadensis*), Canada thistle (*Cirsium arvense*), field sow-thistle (*Sonchus arvensis* ssp. *arvensis*) and wild carrot (*Daucus carota*), clovers (*Trifolium* spp.), sweet clovers (*Melilotus* spp.), blue grasses (*Poa* spp.), smooth brome (*Bromus inermis*), yellow foxtail (*Setaria pumila*), common buckthorn (*Rhamnus cathartica*), Russian olive (*Elaeagnus angustifolia*), and tartarian honeysuckle (*Lonicera tatarica*). Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Identified between agricultural fields are hedgerows and cultural woodlands retained as windbreaks associated with agricultural land use. Several meadow marsh communities persist dominated by reed canary grass (*Phalaris arundinacea*). A mineral shallow marsh dominated by narrow-leaved cattail (*Typha angustifolia*) is also present, which is associated with a Tributary of Shoreacres Creek. Overall, vegetation communities across Alignment Option 1 are heavily influenced by local land use practices including residential development, agriculture and infrastructure.

Alignment Option 2

Cultural communities dominate the area associated with Alignment Option 2 south of the 407 ETR, and several small and isolated wetlands typically associated with highway drainage or associated with local tributaries are present. The cultural meadow and cultural meadow/cultural thicket communities that extend across Option 2, are dominated by disturbance tolerant plant species. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. There are two deciduous plantations and a Fresh-Moist Ash Lowland Deciduous Forest immediately west of Upper Middle Road. The deciduous plantations are comprised of a wide range of deciduous trees including occasional to abundant black walnut (*Juglans nigra*) and American basswood (*Tilia americana*), with other associates including red ash (*Fraxinus pennsylvanica*), Norway maple (*Acer platanoides*), sugar maple (*Acer saccharum* var. *saccharum*), and shagbark hickory (*Carya ovata*). The Fresh-Moist Ash Lowland Deciduous Forest is dominated by red and black ash (*Fraxinus nigra*) many of which are dead or dying due to Emerald Ash Borer (*Agrilus planipennis* or EAB), and this community may transition with changes to species dominance. Disturbance was noted within these wooded communities likely related to their proximity to a hydro corridor and local school with well-established *ad hoc* pathways through these communities. East of Dundas Street a few agricultural fields persist, but several have been removed likely due to new residential development on adjacent lands. Hedgerows, narrow cultural woodlands, Reed-canary Grass Mineral Meadow Marsh and Mineral Shallow Marsh are associated with Tributaries of Shoresacres Creek. Reed canary grass dominates the meadow marsh, and common reed (*Phragmites australis*) dominates Mineral Shallow Marsh. Associated species within the cultural woodland include black walnut (*Juglans nigra*), Manitoba maple (*Acer negundo*) and trembling aspen (*Populus tremuloides*). Overall, vegetation communities within Alignment Option 2 are heavily influenced by local land use practices including ongoing residential development, agriculture and infrastructure.

Dundas Street Station Option A

The area associated with Station Option A, north of the 407 ETR and east of Dundas Street is associated with cultural meadow, cultural woodland, hedgerows, a meadow marsh, and agricultural lands. Cultural communities within this area are highly disturbed and are dominated by non-native, disturbance tolerant plant species. Within the cultural woodland black walnut, Manitoba maple and black locust (*Robinia pseudo-acacia*) are occasional to abundant and riverbank grape (*Vitis riparia*) is abundant both within the ground and shrub layers. The meadow marsh is associated with a slight depression with abundant reed canary grass. Overall, vegetation communities within Station A are heavily influenced by local land use practices including residential development, agriculture, and infrastructure.

Dundas Street Station Option B

The area associated with Station Option B, south of the 407 ETR and east of Dundas Street is associated with cultural thicket/cultural woodland, a Willow Mineral Thicket Swamp, hedgerows and agriculture. Cultural communities within this area are highly disturbed and are dominated by non-native, disturbance tolerant plant species. The cultural thicket/cultural woodland is a community in transition with a range of tree and shrub species including red oak (*Quercus rubra*), sugar maple, Manitoba maple, black walnut, eastern cottonwood (*Populus deltoides*), staghorn sumac (*Rhus typhina*), common buckthorn, and

dogwoods (*Cornus* spp.). The Willow Mineral Thicket Swamp is comprised of a variety of tree and shrub species with abundant willows (*Salix* spp.) with occasional associates including white elm (*Ulmus americana*), Manitoba maple and Freeman's maple (*Acer X freemanii*). Tree and shrub species associated with the hedgerows that bisect remaining agricultural fields include black walnut, bur oak (*Quercus macrocarpa*), sugar maple, trembling aspen, eastern cottonwood, common buckthorn, tartarian honeysuckle, and dogwoods. Overall, vegetation communities within Station B are heavily influenced by local land use practices including ongoing residential development, agriculture and infrastructure.

SEGMENT S2: EAST OF DUNDAS STREET TO EAST OF APPLEBY LINE

Alignment Option 1

Agricultural fields and cultural communities dominate the area associated with Alignment Option 1 north of the 407 ETR. Several small and isolated wetlands typically associated with highway drainage or with local tributaries including Tributaries of Appleby Creek and Sheldon Creek, are present. The cultural meadows associated with this alignment across Segment S2, are dominated by disturbance tolerant plant species. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields that are no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Between agricultural fields are several hedgerows and a cultural thicket/cultural woodland, which are likely maintained as windbreaks associated with agricultural land use. Reed canary grass dominates the meadow marsh communities, and common reed dominates mineral shallow marsh communities that are present. Overall, vegetation communities across Option 1 are heavily influenced by local land use practices including agriculture and infrastructure.

Alignment Option 2

Cultural communities and agricultural fields dominate the area associated with Alignment Option 2 south of the 407 ETR. Several small wetlands typically associated with highway drainage or associated with local tributaries are present. The cultural meadow communities across Segment S2 are dominated by disturbance tolerant plant species. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Within a narrow cultural woodland, a range of tree and shrub species were observed including several species of oak (*Quercus* spp.), shagbark hickory, silver maple (*Acer saccharinum*), common buckthorn and tartarian honeysuckle. At the southeast corner of the 407 ETR and Walkers Line, a Maple Mineral Deciduous Swamp and a mineral shallow marsh were observed. Within the swamp, Manitoba maple and silver maple were occasional to abundant with several willow species predominantly in the shrub layer, and within the adjacent shallow marsh community, common reed is dominant. Other wetland communities include meadow marshes dominated by reed canary grass, and additional mineral shallow marsh communities dominated by narrow-leaved cattail or by common reed. There is also a Willow Mineral Deciduous Swamp associated with a Tributary of Sheldon Creek with several willow (*Salix* spp.) species dominant. Overall, vegetation communities within Alignment Option 2 are heavily influenced by local land use practices including ongoing commercial/industrial development, agriculture and infrastructure.

Appleby Line Station Option A

Agricultural fields and cultural communities dominate the area associated with Station Option A north of the 407 ETR and west of Walkers Line. The cultural meadow community associated with this station location are dominated by disturbance tolerant plant species. Overall, vegetation communities associated with the Station A location are heavily influenced by local land use practices including agriculture and infrastructure.

Appleby Line Station Option B

An agricultural field and cultural meadow dominate the area associated with Station Option B south of the 407 ETR and west of Walkers Line. The cultural meadow communities associated with this station location are dominated by disturbance tolerant plant species. The narrow cultural woodland is on lands adjacent to the proposed station footprint, and thus, no impacts are expected to this community. Overall, vegetation communities associated with the Station A location are heavily influenced by local land use practices, predominantly commercial/industrial and residential development, agriculture and infrastructure.

SEGMENT S3: EAST OF APPLEBY LINE TO EAST OF TREMAINE ROAD

Alignment Option 1

Cultural communities were observed throughout the tableland portion of Alignment Option 1, north of the 407 ETR and east of Appleby Line. Natural areas along Bronte Creek were identified within the valley slopes and floodplain, which are part of the Zimmerman Valley Life Science ANSI. A few isolated wetlands were identified associated with highway drainage or associated with local tributaries. Several areas were notably disturbed in proximity to hydro infrastructure and the local industry. The cultural meadow communities across Option 1 are dominated by non-native and disturbance tolerant plant species. Meadow communities dominated by non-native and disturbance tolerant plant species are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas.

A Mineral Open Bluff is located along the eastern bank of Bronte Creek where vegetation cover is rare. Several high-quality forest communities were observed including a Dry-Fresh Sugar Maple Deciduous Forest, a Fresh-Moist Sugar Maple-Black Maple Deciduous Forest that is provincially ranked S3 (i.e., vulnerable), and a Dry-Fresh Sugar Maple-Oak Deciduous Forest. These communities typically contained a diverse range of plant species with limited disturbance. Plant species included black maple (*Acer saccharum* ssp. *nigrum*), shagbark hickory, eastern hemlock (*Tsuga canadensis*), pale touch-me-not (*Impatiens pallida*) a regionally rare species (see **Table 3.3**), bloodroot (*Sanguinaria canadensis*), ostrich fern (*Matteuccia struthiopteris* var. *pennsylvanica*), and Michigan lily (*Lilium michiganense*). Along the western bank of Bronte Creek a narrow (<1m) Forb Mineral Shallow Marsh was identified. East of the rail tracks a Dry-Fresh Sugar Maple Hickory Deciduous Forest was identified, but observations were only undertaken from the forest edge due to access constraints. Narrow wetland communities were observed both west and east of Tremaine Road. These include two Reed-canary Grass Mineral Meadow Marshes associated with Tributaries of Fourteen Mile Creek, and a mineral shallow marsh community dominated by common reed. East of Tremaine Road a small portion of the alignment bisects the southern portion of an agricultural field, lands that are identified as part of the provincially significant Trafalgar Moraine Earth Science ANSI. Within Segment S3, two mid-sized butternut (*Juglans cinerea*) trees and numerous seedlings were identified. Overall, the vegetation communities across Option 1 are influenced by agriculture, commercial development and infrastructure.

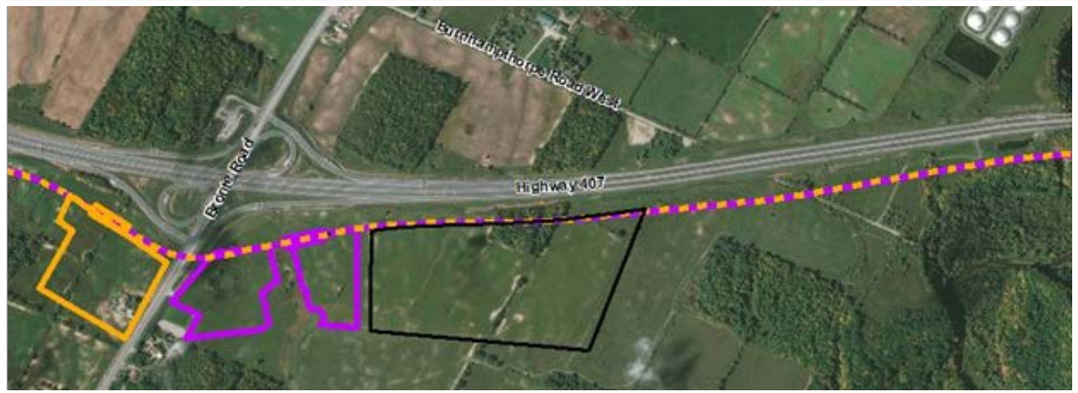
Alignment Option 2

Cultural communities and agricultural fields dominate the tableland portion of Alignment Option 2, south of the 407 ETR and east of Appleby Line. Natural areas along Bronte Creek were identified within the valley slopes and floodplain, which are part of the Zimmerman Valley Life Science ANSI. A few isolated wetlands were observed associated either with highway drainage or with local tributaries. Non-native and disturbance tolerant plant species dominate the cultural meadow communities observed across Alignment Option 2. Meadow communities are typically within the right-of-way adjacent to roads and associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Cultural thicket communities were also identified with a range of tree and shrub species including red oak, trembling aspen, green ash, staghorn sumac, gray dogwood, scarlet hawthorn, and common buckthorn. A Mineral Open Bluff is associated with the western bank of Bronte Creek where vegetation cover is rare. As well, several forested communities were observed including a Dry-Fresh Sugar Maple Deciduous Forest and a Fresh-Moist Ash Lowland Deciduous Forest. Within the Ash Lowland Deciduous Forest, numerous ash trees observed were dead or dying due to EAB, and a mid-aged basswood tree was in very poor condition.

A cultural meadow/cultural thicket is located within the floodplain east of Bronte Creek, with Manitoba maple, staghorn sumac, white willow, riverbank grape and red raspberry (*Rubus idaeus*) identified as rare to occasional and reed canary grass, common wormwood (*Artemisia absinthium*), glandular touch-me-not (*Impatiens glandulifera*), Indian hemp (*Apocynum cannabinum* var. *cannabinum*), and riverbank grape identified as rare to abundant. The narrow (<1m) Forb Mineral Shallow Marsh identified north of the 407 ETR along the western bank of Bronte Creek, continues south of the highway. East of Tremaine Road a small, isolated Dry-Fresh Sugar-Oak Deciduous Forest was identified with minimal disturbance and a diverse range of plant species. Species included sugar maple, both red and white oak, shagbark hickory, basswood, scarlet hawthorn, ironwood (*Ostrya virginiana*), stellate sedge (*Carex rosea*), pointed broom sedge (*Carex scoparia*) a regionally rare species (see **Table 3.3**), and poison-ivy (*Rhus radicans* ssp. *negundo*). Narrow wetland communities observed primarily east of Tremaine Road include meadow marsh communities dominated by reed canary grass, and mineral shallow marsh communities dominated by common reed and/or cattails. These wetlands are typically associated with Tributaries of Fourteen Mile Creek. Overall, the vegetation communities across Option 2 are influenced by agriculture, infrastructure, and to a lesser extent by commercial/industrial development.

A small wetland that is complexed, as part of the provincially significant North Oakville-Milton West Wetland Complex (MAM2-2e) and edge habitat associated with a Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3e) within the Sixteen Mile Creek Candidate ANSI, would be impacted within Segment S4.

SEGMENT S4: EAST OF TREMAINE ROAD TO WEST OF SIXTEEN MILE CREEK



Alignment Options 1 and 2

Alignment Options 1 and 2 bisect virtually the same area south of the 407 ETR, thus, existing conditions discussed below are for both options because there are little to no differences. Overall, cultural communities and agricultural fields dominate the area associated with both alignment options south of the 407 ETR. Non-native and disturbance tolerant plant species dominate the cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Between the agricultural fields are several hedgerows that were likely maintained as windbreaks associated with agricultural land use. A cultural meadow/cultural thicket community in transition was identified associated with a Tributary of Fourteen Mile Creek. There are also several small and isolated wetlands typically associated with highway drainage or with Tributaries of Fourteen Mile Creek. These include Reed-canary Grass Mineral Meadow Marsh and mineral shallow marsh communities. The shallow marsh habitat is typically dominated by common reed or cattails. The cultural meadow and cultural meadow/cultural thicket communities that extend across Options 1 and 2, are dominated by disturbance tolerant plant species. East of Regional Road 25 is a small, isolated Dry-Fresh Sugar Maple-Oak Deciduous Forest. This forest community includes red oak of which several are in poor condition, sugar maple, red maple, white pine (*Pinus strobus*), shagbark hickory, stellate sedge, pointed broom sedge, small jack-in-the-pulpit (*Arisaema triphyllum* ssp. *triphyllum*), large-leaved aster *Eurybia macrophyllus*), and poison-ivy. Overall, vegetation communities within both alignment options associated with Segment S4 are heavily influenced by local agricultural land use practices and infrastructure.

Bronte Road Station Option A

The area associated with Station Option A south of the 407 ETR and east of Bronte Road (Regional Road 25), is associated with cultural meadow and hedgerows. Non-native and disturbance tolerant plant species dominate cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. A Reed-canary Grass Mineral Meadow Marsh (MAM2-2b) is located within the footprint of this Bronte Station. A Cattail Mineral Shallow Marsh (MAS2-1d) is located adjacent and east of the station. This marsh is dominated by narrow-leaved cattails with a small disturbed upland area around which the wetland has developed. This wetland is associated with a Tributary of Fourteen Mile Creek and is complexed as part of the provincially significant North Oakville-Milton West Wetland Complex. Based on the proposed Station Option A footprint, impacts to this wetland would be minimized. Overall, vegetation communities within Station Option A are heavily influenced by agricultural land use and infrastructure.

Bronte Road Station Option B

The area associated with Station Option B, south of the 407 ETR and west of Bronte Road (Regional Road 25) is associated primarily with agricultural lands, hedgerows maintained as wind breaks between agricultural fields, and to a lesser extent cultural meadow dominated by non-native and disturbance tolerant plant species. A mineral shallow marsh that is dominated by common reed is also located within the Station Option B footprint. This marsh appears to have developed, in part, due to drainage from adjacent roads. Non-native, disturbance tolerant plant species dominate the cultural communities. Overall, vegetation communities within Station Option B are influenced by agricultural land use and infrastructure.

Bronte Road Bus Storage Yard Option

The proposed Bus Storage Yard, south of the 407 ETR and east of Bronte Road (Regional Road 25) outlined in black in the figure above, is primarily associated with agricultural fields and hedgerows maintained as wind breaks. A Cattail Mineral Shallow Marsh (MAS2-1d) is located adjacent and west of the Bus Storage Yard, lying in between this area and the Bronte Street Station Option A, further west. This wetland is associated with a Tributary of Fourteen Mile Creek and is complexed as part of the provincially significant North Oakville-Milton West Wetland Complex. Further east is another narrow Cattail Mineral Shallow Marsh that is likely associated with drainage from the adjacent highway within the footprint, as well as a small, isolated Dry-Fresh Sugar Maple-Oak Deciduous Forest. This forest is comprised of a range of plant species (as noted above for the Alignment Options 1 and 2), including red oak of which several are in poor condition, sugar maple, red maple, white pine, shagbark hickory, stellate sedge, pointed broom sedge, small jack-in-the-pulpit, large-leaved aster, and poison-ivy. Overall, vegetation communities within the Bus Storage Yard are heavily influenced by agricultural land use and infrastructure.

SEGMENT S5: WEST OF SIXTEEN MILE CREEK TO EAST OF TRAFALGAR RD

Alignment Options 1 and 2

Alignment Options 1 and 2 bisect essentially the same area south of the 407 ETR, thus existing conditions are discussed below for both options. Overall, existing conditions across Options 1 and 2 are a mix of cultural communities including cultural thicket and woodland, agricultural fields and hedgerows, forest, and several small wetlands across the tableland portion of Segment S5. Non-native and disturbance tolerant plant species dominate the cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Natural communities are associated with Sixteen Mile Creek observed along valley slopes and the floodplain. Several hedgerows maintained as windbreaks for agricultural land use are associated with agricultural fields.

Two forest communities were identified across the tablelands including a Dry-Fresh Sugar Maple-Beech Deciduous Forest, and a Dry-Fresh Oak-Hardwood Deciduous Forest. The Sugar Maple-Beech Deciduous Forest includes a diverse range of species like sugar maple, shagbark hickory, red oak, Freeman's maple, basswood, scarlet hawthorn, chokecherry (*Prunus virginiana*), American dog violet (*Viola conspersa*), poison-ivy, yellow avens (*Geum aleppicum*), pointed broom sedge, and enchanter's nightshade (*Circaea lutetiana* ssp. *canadensis*). Ash and American beech (*Fagus grandifolia*) were also observed several of which are in poor condition and dying. Disturbance was noted including an *ad hoc* path, and non-native species including garlic mustard (*Alliaria petiolata*) and glandular touch-me-not observed as rare. Within the Oak-Hardwood Deciduous Forest a diverse variety of species were observed, but observations were limited due access constraints. Species included shagbark hickory, sugar maple, red oak, white pine, basswood, Manitoba maple, and to a lesser extent ash of which several individuals had succumbed to EAB, black walnut, chokecherry, and running strawberry-bush (*Euonymus obovata*). Ground flora observed included Pennsylvania sedge (*Carex pennsylvanica*), large-leaved aster, two-leaved toothwort (*Cardamine diphylla*), enchanter's nightshade, spotted crane's-bill (*Geranium maculatum*) and herb-robert (*G. robertianum*). There are several, small wetland pockets that occur across this strip of forest. This forest unit is contiguous with forest to the south, which is part of the Oakville-Milton Wetlands and Uplands Provincial Candidate Life Science ANSI. Several Gray Dogwood Cultural Thickets were identified west of Neyagawa Boulevard. Within the larger thicket to the west, white spruce (*Picea glauca*) was abundant with approximately 25% cover. A small cultural woodland associated with a residence, just east of Trafalgar, was identified. Adjacent to this woodland is a small mineral shallow marsh dominated by narrow-leaved cattails with occasional reed canary grass and silver maple as emergent. Several other very small wetlands are present across the tableland dominated either by cattails or reed canary grass.

Numerous vegetation communities are associated with Sixteen Mile Creek. These include a Mineral Open Bluff observed west of the watercourse where vegetation cover is rare. Several forested communities were identified including a Dry-Fresh White Cedar Coniferous Forest, Fresh-Moist Willow Lowland Deciduous Forest and the dominant forest cover is comprised of Dry-Fresh Sugar Maple-Oak Deciduous Forest that is primarily located along slopes and up onto tableland both west and east of the watercourse. These are typically diverse communities with limited disturbance. Along the western bank is a Forb Mineral Meadow Marsh with reed canary grass, purple loosestrife (*Lythrum salicaria*), spotted Joe-pye-weed (*Eupatorium maculatum* ssp. *maculatum*) and spotted touch-me-not as occasional to abundant. Floating-leaved macrophytes were also rarely observed including broad-leaved arrowhead (*Sagittaria latifolia*) and common water-plantain (*Alisma plantago-aquatica*). Palmate-leaf sweet-coltsfoot (*Petasites frigidus*) a regionally rare species (see **Table 2**), was also observed rarely within this community. A cultural thicket is located east of Sixteen Mile Creek with a range of species that included Manitoba maple, staghorn sumac, common buckthorn and willows observed as abundant in the shrub layer with crack willow (*Salix fragilis*), eastern cottonwood, silver maple and sycamore (*Platanus occidentalis*) observed as occasional to rare. Sycamore is a regionally rare species (see **Table 2**). Overall, the vegetation communities across Options 1 and 2 are influenced primarily by agriculture and infrastructure.

Within Segment S5, a Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3e) and Mineral Cultural Thicket (CUT1b) associated with the Sixteen Mile Creek Candidate ANSI would be impacted due to the runningway. West of Neyagawa Boulevard, the runningway is within 20 m to 30 m of a large forested tract that is part of the Oakville-Milton Wetlands and Uplands Candidate ANSI. West of Trafalgar Road the runningway and a small portion of the Trafalgar Road Station will impact the northern portion of a Dry-Fresh Oak-Hardwood Deciduous Forest (FOD2-4a), habitat that is also identified as part of the candidate ANSI. Several small wetlands within this forest are complexed as part of the provincially significant North Oakville-Milton West Wetland Complex, one of which would be impacted.

Trafalgar Road Station Option

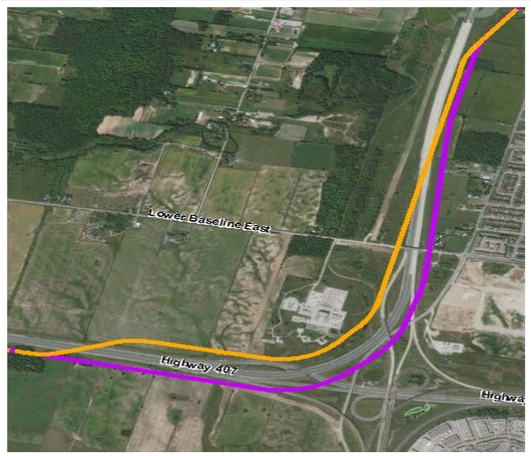
The area associated with the Trafalgar Road Station Option south of the 407 ETR and west of Trafalgar Road is associated with agricultural fields, hedgerows, a portion of a Dry-Fresh Oak-Hickory Deciduous Forest, a small Cattail Mineral Shallow Marsh, cultural meadow, and manicured areas associated with the GO Transit Carpool Parking Lot. The Dry-Fresh Oak-Hickory Deciduous Forest observed is comprised of a diversity of species including red oak, shagbark hickory, sugar maple, ironwood, running strawberry-

bush (*Euonymus obovata*), blue-stem goldenrod (*Solidago caesia*), and Pennsylvania sedge. A Cattail Mineral Shallow Marsh identified adjacent to this forest, is dominated by broad-leaved cattails (*Typha latifolia*) and includes abundant reed canary grass, with emergent crack willow and Freeman's maple. These natural areas are contiguous with forest to the west, the southern portion of which is part of the Oakville-Milton Wetlands and Uplands Provincial Candidate Life Science ANSI. Within cultural communities and manicured areas non-native and disturbance tolerant plant species dominate. Meadow communities are typically within the right-of-way adjacent to roads. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Overall, vegetation communities within the Trafalgar Road Station Option are influenced by agricultural land use and infrastructure.

Trafalgar Road Bus Storage Yard Option

The area associated with the proposed Trafalgar Road Bus Storage Yard south of the 407 ETR and east of Trafalgar Road, outlined in black in the figure above, is comprised primarily of agricultural fields, cultural meadow, and a Cattail Mineral Shallow Marsh and Mineral Cultural Woodland associated with a single residence. Non-native and disturbance tolerant plant species dominate the cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. The Cattail Mineral Shallow Marsh is dominated by narrow-leaved cattails with emergent willows and silver maple. The Mineral Cultural Woodland includes silver maple, black walnut, black locust, trembling aspen and common buckthorn. Overall, vegetation communities within the footprint of the Trafalgar Road Bus Storage Yard are heavily influenced by agricultural land use and infrastructure.

SEGMENT S6: EAST OF TRAFALGAR ROAD TO NORTH OF LOWER BASE LINE



Alignment Options 1 and 2 bisect an area with similar natural heritage features adjacent to the 407 ETR to north of Lower Base Line where the Alignment Options converge within Segment S6. Thus, existing conditions are discussed below for both options. A large section of Option 1 will be constructed underground (tunnel).

Cultural communities and agricultural fields dominate the area associated with Alignment Option 1 and 2. Cultural meadow communities are dominated by non-native, disturbance tolerant plant species. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Several small and narrow wetlands typically associated with highway drainage or associated with local tributaries are present. A mineral shallow marsh associated with a Tributary of Joshua Creek was observed south of the 407 ETR with common reed and narrow-leaved cattails as abundant, and a meadow marsh dominated by reed canary grass also associated with another Tributary of Joshua Creek was identified north of the 407 ETR.

Other meadow and shallow marsh communities across Options 1 and 2, are dominated by reed canary grass, common reed or cattails. North of the highway two small Gray Dogwood Cultural Thickets were identified, with common buckthorn and tartarian honeysuckle in the shrub layer and reed canary grass, giant goldenrod (*Solidago gigantea*), and fox sedge (*Carex vulpinoidea*) in the ground layer. A range of tree and shrub species were observed associated within a few, very narrow hedgerows that are typically associated with agriculture. A Dry-Fresh Oak-Hardwood Deciduous Forest is located east of Trafalgar Road south of the highway. Tree species include red oak, shagbark hickory, sugar maple, bur oak, white pine and basswood, with enchanter's nightshade, Canada anemone (*Anemone canadensis*), and herb-robert occasional to abundant in the ground layer.

Cultural communities dominate the area west and east of the 407 ETR where the highway bends towards the north, north and south of Lower Base Line. Cultural communities include cultural meadow, a small cultural thicket and small cultural woodland, and manicured areas associated with a residential development. Non-native, disturbance tolerant species dominate these cultural communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. There is also a small Cattail Mineral Shallow Marsh dominated by narrow-leaved cattails and a Reed-canary Grass Meadow Marsh. These wetlands are in low-lying areas and appear to be, in part, associated with drainage from adjacent roads. Overall, vegetation communities across Options 1 and 2 within Segment S6 are heavily influenced by local land use practices primarily agriculture, residential development and infrastructure.

SEGMENT S7: NORTH OF LOWER BASE LINE TO NORTH OF BRITANNIA ROAD

Alignment Options 1 and 2

Alignment Options 1 and 2 bisect the same area east of the 407 ETR, thus, existing conditions discussed below are for both options because there are little to no differences.

Overall, cultural communities, agricultural fields, wetlands, and storm ponds dominate the area associated with both alignment options east of the 407 ETR. Hedgerows observed between agricultural fields are maintained as windbreaks between fields and as visual screening. Cultural communities include cultural meadow, cultural woodlands and manicured areas associated with residential and commercial development. These cultural communities are dominated by non-native, disturbance tolerant plant species. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. A small and isolated Green Ash Mineral Deciduous Swamp is present and a significant number of ash trees are negatively affected by EAB, these trees are dead or are dying. Plant surveys were limited in this area due to access constraints. Adjacent to this swamp, several agricultural fields have been removed and a large commercial development is under construction. There are also several Reed-canary Grass Meadow Marshes and mineral shallow marsh communities dominated either by common reed or by cattails. These wetlands appear to be, in part, associated with road drainage, or associated with the Tributary of East Sixteen Mile Creek. Overall, vegetation communities within Segment S7 are heavily influenced by local land use practices agriculture, residential and to a lesser extent commercial development.

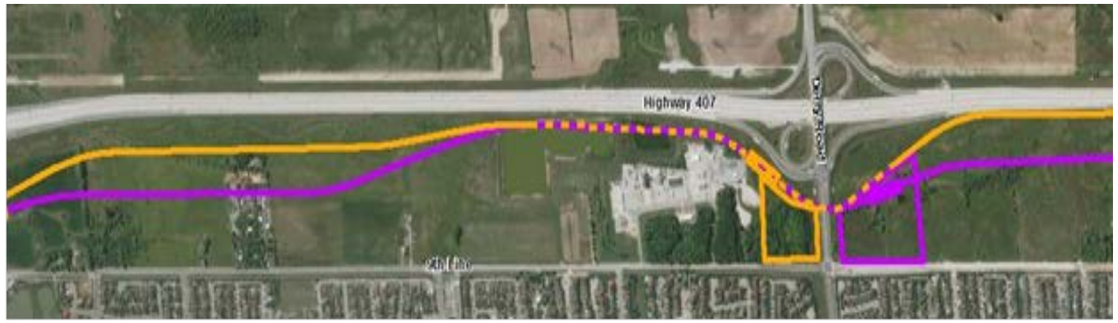
Britannia Road Station Option A

Cultural meadow dominates the area associated with Station A, south of Britannia Road and east of the 407 ETR. The cultural meadow community is dominated by non-native, disturbance tolerant plant species. Within the Station Option A footprint there is also a residential unit with manicured areas, and several meadow marsh communities that are dominated by reed canary grass. One meadow marsh community is associated with the Tributary of East Sixteen Mile Creek. Overall, vegetation communities within the Station A footprint are heavily influenced by local land use practices primarily residential development and infrastructure.

Britannia Road Station Option B

Cultural meadow and manicured areas associated with commercial development dominate the area associated with Station Option B, north of Britannia Road and east of the 407 ETR. Non-native, disturbance tolerant plant species dominate the cultural meadow community. Within the Station Option B footprint there is also a small Reed-canary Grass Meadow Marsh and a small Cattail Mineral Shallow Marsh. Overall, vegetation communities within the Station B footprint are heavily influenced by local land use practices primarily commercial development and infrastructure.

SEGMENT S8: NORTH OF BRITANNIA RD TO NORTH OF DERRY RD



Alignment Options 1 and 2

Alignment Options 1 and 2 bisect virtually the same area east of the 407 ETR with a slight offset of each other north of Brittania Road over to mid-way through Segment S8, and through this area the existing conditions are the same northward to where the two alignments join, through the remaining portion of Segment S8. Thus, the existing conditions discussed below are for both options.

Overall, cultural communities, wetlands, old agricultural fields, and storm ponds dominate the area associated with both alignment options. Hedgerows observed between agricultural fields are maintained as windbreaks between fields and as visual screening. Cultural communities include cultural meadow, cultural woodland, and manicured and disturbed areas associated with residential and commercial/industrial development. Cultural communities are dominated by non-native, disturbance tolerant plant species. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. A Fresh-Moist Sugar Maple-White Elm Deciduous Forest borders

both alignments just south of Derry Road. Access to this community was limited and thus surveys undertaken were only from west and north forest edges. This forest is comprised of a range of species including sugar maple, shagbark hickory, oak species, basswood, enchanter's nightshade, and may-apple (*Podophyllum peltatum*). There are several Reed-canary Grass Mineral Meadow Marshes and a Green Ash Mineral Deciduous Swamp identified, these are typically associated with the Tributary of East Sixteen Mile Creek that crosses Segment S8. Mineral shallow marsh communities were also identified, and these are typically dominated either by common reed or by cattails. Overall, vegetation communities within Segment S8 are heavily influenced by local land use practices including agriculture, commercial/industrial development and infrastructure.

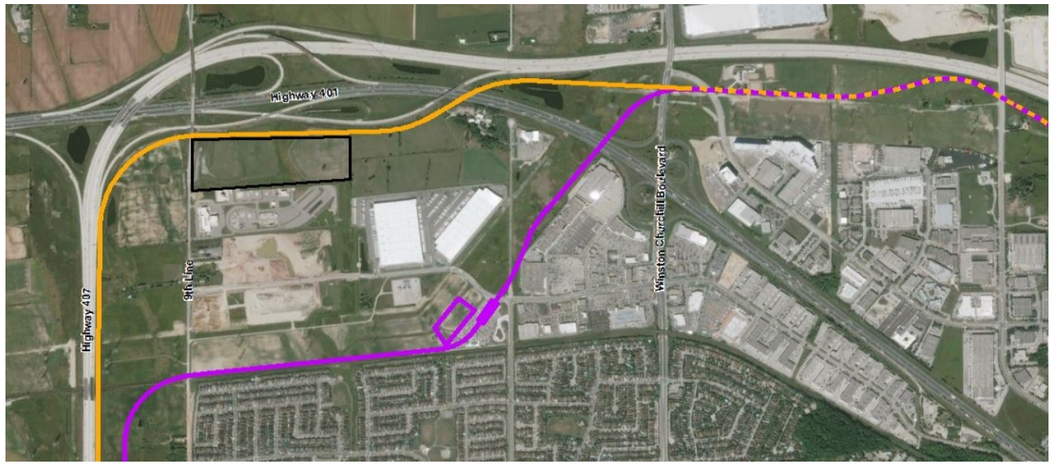
Derry Road Station Option A

Cultural meadow, wetland and manicured areas are dominant within the Station Option A footprint north of Derry Road and east of the 407 ETR. Non-native, disturbance tolerant plant species dominate the cultural meadow community. Within the Station Option A footprint there is a former residential unit with manicured areas and planted trees, and an associated hedgerow that was likely maintained for screening. Non-native and disturbance tolerant species dominate cultural meadow and manicured areas. Also, within the station footprint is a small portion of a Reed-canary Grass Mineral Marsh that is associated with Tributary of East Sixteen Mile Creek. Overall, vegetation communities within the Station Option A are influenced by local land use practices, including former agricultural land use and infrastructure.

Derry Road Station Option B

A Fresh-Moist Sugar Maple-White Elm Deciduous Forest, cultural meadow, and a Reed-canary Grass Mineral Marsh associated with Tributary of East Sixteen Mile Creek, were identified within the Station Option B footprint, south of Britannia Road and east of the 407 ETR. The large forested area is connected to two other forest fragments that have been bisected by driveways associated with the Union Gas Parkway Station. As noted above, access constraints limited survey observations to along forest edges. The large forest track likely contains a diverse variety of plant species as noted above in the Segment S8 Alignment Options discussion. Overall, this forest appears to be in good condition. Non-native and disturbance tolerant species dominate cultural meadow communities. Overall, vegetation communities within the Station Option B are influenced by local land use practices, including industrial development and infrastructure.

SEGMENT S9: NORTH OF DERRY ROAD TO WEST OF HERITAGE ROAD



Alignment Option 1

Alignment Option 1 is associated with a hydro corridor crossing in a northeast direction until just south of the 407 ETR where it converges with Option 2 at Winston Churchill Boulevard. A large section of the Option 1 alignment within Segment S9 will be constructed underground (tunnel). Overall, cultural communities, agricultural fields and wetlands dominate the area. Cultural communities consist of cultural meadow. Non-native, disturbance tolerant plant species dominate cultural meadow communities. There are several Reed-canary Grass Mineral Meadow Marshes and a mineral shallow marsh/mineral meadow marsh community across this option that are associated with a Tributary of East Sixteen Mile Creek. The mineral shallow marsh/mineral meadow marsh community is located within a defined channel that directs drainage across the length of the hydro corridor to just north of Argentia Road. This community is variably dominated by reed canary grass, common reed and cattails. Overall, vegetation communities across Alignment Option 1, are heavily influenced by local land use practices including agriculture and infrastructure.

Alignment Option 2

Alignment Option 2 is located northeast of the 407 ETR to 9th Line where the alignment continues just south of the 407 ETR to where it convergs with Option 1 at Winston Churchill Boulevard. Overall, cultural communities, agricultural fields and wetlands dominate the area associated with both alignment options. Hedgerows observed between agricultural fields are maintained as windbreaks between fields and as visual screening. Cultural communities include cultural meadow and manicured and disturbed areas associated with primarily commercial and industrial development. Non-native, disturbance tolerant plant species dominate cultural meadow communities across Segment S9. Meadow communities are also within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass

or occasionally cattails, typically along roadside ditches and low-lying areas. There are several Reed-canary Grass Mineral Meadow Marshes typically associated with the Tributary of East Sixteen Mile Creek. Mineral Shallow Marsh communities were also identified, and these are typically dominated either by common reed or by cattails. Overall, vegetation communities within Segment S9 are heavily influenced by local land use practices including agriculture, commercial and industrial development, and infrastructure.

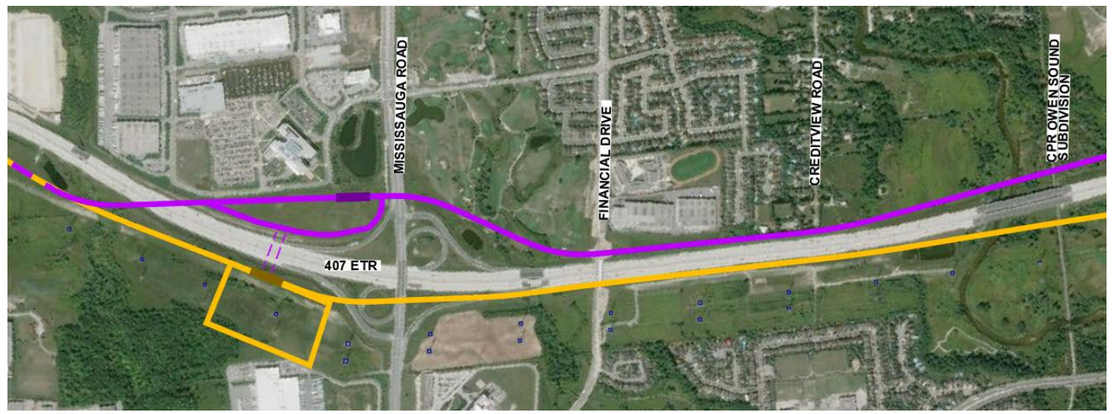
Winston Churchill Boulevard Station Option

Cultural meadow, manicured areas and area of disturbance associated with a horse stable, dominant the Winston Churchill Blvd Station Option footprint located north of the 407 ETR and east of Meadowpine Blvd. Non-native, disturbance tolerant plant species dominate cultural meadow communities and manicured area. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. A small Cattail Mineral Shallow Marsh is also located within the Station Option. This wetland habitat is dominated by narrow-leaved cattails with abundant reed canary grass with emergent willows, and a minor component of floating macrophytes including rare to occasional common water-plantain and common floating pondweed (*Potamogeton natans*). Overall, vegetation communities within the Winston Churchill Blvd Station Option are influenced by local land use practices including commercial development, agriculture and infrastructure.

Winston Churchill Boulevard Bus Storage Yard

Agricultural fields, manicured areas associated with a driving range, and cultural meadow habitat are dominant within the Bus Storage Yard footprint southeast of the 407 ETR, outlined in black in the figure above. Non-native, disturbance tolerant plant species dominate cultural meadow communities and manicured areas. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Two Mineral Shallow Marsh communities are also within the Bus Storage Yard footprint. One is a small wetland associated with the driving range, with common reed observed as dominant. This wetland is associated with a Tributary of East Sixteen Mile Creek with flows that are intermittent. Flows appear to cross the central portion of the driving range in a very narrow depression (<0.5 m in with) that is regularly mown. The second wetland is a Cattail Mineral Shallow Marsh associated with another Tributary of East Sixteen Mile Creek, north of the driving range. This wetland is wide and conveys flows eastward towards the commercial development on adjacent lands. This wetland is dominated by narrow-leaved cattails with occasional purple loosestrife, reed canary grass and common reed. Overall, vegetation communities within the Bus Storage Yard footprint are influenced by local land use practices including commercial development, agriculture and infrastructure.

SEGMENT S10: WEST OF HERITAGE RD TO EAST OF CREDIT RIVER



Alignment Option 1

Cultural communities are dominant across Alignment Option 1, and wetlands and manicured areas are also present distributed occasionally across this alignment option, north of the 407 ETR. Non-native, disturbance tolerant plant species dominate cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. There is a cultural woodland adjacent to a golf course, where access was limited during surveys. This woodland community includes tree species like sugar maple and black walnut with shrubs like common buckthorn and tartarian honeysuckle. Wetlands observed within Alignment Option 1 are comprised of a Green Ash Mineral Deciduous Swamp, Reed-canary Grass Mineral Meadow Marsh, mineral shallow marsh, and a mineral shallow marsh/mineral meadow marsh. These are typically associated with a Tributary of Mullet Creek and Levi Creek. The Green Ash Mineral Deciduous Swamp was surveyed only from the community edge due to access constraints. Species included red ash (also known as green ash), black walnut, white willow, trembling aspen, common buckthorn, gray dogwood and red-osier dogwood (*Cornus sericea* ssp. *sericea*). Numerous red ash trees were notably in decline likely impacted by EAB, and trees were either dead or dying. Two mineral shallow marsh communities were observed associated with storm ponds, where narrow-leaved cattails are dominant with species like gray dogwood rarely emergent. A mineral shallow marsh/mineral meadow marsh community was identified in a low-lying area associated with Levi Creek. Access was limited during surveys, but common reed and reed canary grass were noted as occasional to abundant with purple loosestrife rarely observed, and Manitoba maple and red ash rarely emergent. Overall, vegetation communities within the Alignment Option 1 are influenced by local land use practices including commercial and industrial development, and infrastructure.

Alignment Option 2

Cultural communities are dominant across Alignment Option 2, and wetlands and a few agricultural fields are also present distributed occasionally across this alignment option, south of the 407 ETR. Non-native, disturbance tolerant plant species dominate cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. Hydro corridors are also associated with cultural meadow communities as is the case in Alignment Option 2. Cultural woodland and cultural thicket communities were also identified and include Manitoba maple, riverbank grape, common buckthorn, white mulberry (*Morus alba*), red-osier dogwood and Russian olive. Ground flora within these communities include reed canary grass, smooth brome, and wild teasel (*Dipsacus fullonum* ssp. *sylvestris*). Several Reed-canary Grass Mineral Meadow Marsh communities are located within Option 2, and a mineral shallow marsh that is associated with a storm pond. Within the low-lying area associated with the Credit River, which crosses Segment S10, is a Fresh-Moist Willow Lowland Deciduous Forest. Plant species within this community include white willow, crack willow, Manitoba Maple, red ash, bur oak, common buckthorn and tartarian honeysuckle. This community contained numerous non-native species including wild teasel, wild carrot, and smooth brome. Overall, vegetation communities within the Alignment Option 2 are influenced by local land use practices including residential development, agriculture and infrastructure.

At the east end of Segment S10, east of the Credit River, the runningway for both Option A and B impact the northern edge of a Reed-canary Grass Meadow Marsh (MAM2-2m) that is part of the provincially significant Churchville-Norval Wetland Complex.

A change to this segment has been made since the initial analysis of Alignment Option 1 and Alignment Option 2. This was due to new information received regarding existing archaeological potential south of the 407 ETR around Credit River area. The change consists of the crossing of the Credit River on the north side of 407 ETR. This change has been presented in Chapter 6.

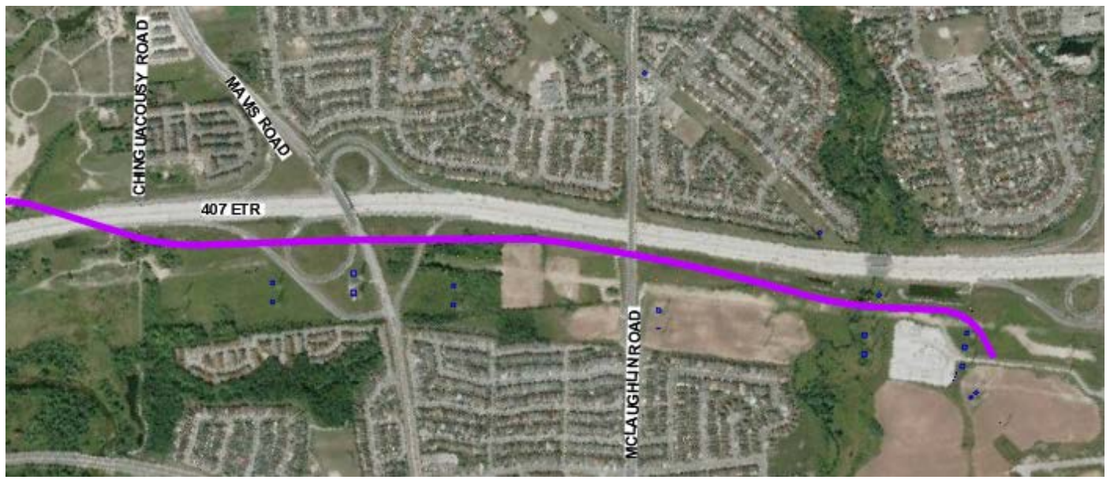
Mississauga Station Option A

Cultural meadow and manicured areas are dominant within the Station Option A footprint north of the 407 ETR. Non-native, disturbance tolerant plant species dominate the cultural meadow community. Within a small portion of the Station A footprint there is an existing manicured area/park associated with a storm pond. Overall, vegetation communities within the Station A footprint are influenced by local land use practices primarily commercial development and infrastructure.

Mississauga Station Option B

Cultural meadow is dominant within the Station Option B footprint south of the 407 ETR. Non-native, disturbance tolerant plant species dominate the cultural meadow community, which is associated with a hydro corridor. There is also a forested community associated with an Environmentally Significant Area at the very southwest corner of the Option B footprint that would be impacted along its northern edge. Overall, vegetation communities within the Station B footprint are influenced by local land use practices primarily commercial development and infrastructure; however, the forest community provides habitat for a wide range of plant species.

SEGMENT S11: EAST OF CREDITRIVER ROAD TO WEST OF HURONTARIO STREET



Alignment Options 1 and 2

Alignment Options 1 and 2 bisect virtually the same area south of the 407 ETR. A large section of Option 1 will be constructed underground (tunnel). The existing conditions discussed below are for both options.

Cultural communities are dominant across Alignment Options 1 and 2 south of the 407 ETR. Vegetation communities consist of cultural meadow and cultural thicket habitat with a few agricultural fields. Within these communities, non-native, disturbance tolerant plant species dominate cultural meadow communities. Meadow communities are typically within the right-of-way adjacent to roads, as well as associated with old agricultural fields no longer in use. Roadside cultural meadow regularly includes localized patches of common reed, reed canary grass or occasionally cattails, typically along roadside ditches and low-lying areas. A cultural woodland is located within the 407 ETR and Mavis Road Interchange and includes red oak, shagbark hickory, black walnut, trembling aspen, common buckthorn, and downy thorn (*Crataegus mollis*). Cultural thicket communities were typically dominated by common buckthorn or included staghorn sumac as abundant. Other communities include Reed-canary Grass Mineral Meadow Marsh associated with a Tributary of Fletcher's Creek, and a mineral shallow marsh associated with an agricultural field. The Reed-canary Grass Mineral Meadow Marsh at the west end of Segment S11 is also associated with the provincially significant Churchville-Norval Wetland Complex. The runningway for both Options 1 and 2 will impact the northern edge of this wetland community.

Overall, vegetation communities within the portion of Alignment Options 1 and 2, east of the Credit River to west of Hurontario Street, are influenced by local land use practices including residential development and infrastructure.

FLORA

Detailed field work has been undertaken along the 407 Transitway in 2018 and 2019 to document species presence within the study area. A vascular plant list has been prepared as a result of botanical survey data collected for vegetation communities identified in Table 1. A total of 304 plant species were recorded within the study area, however, 15 of these plants could only be identified to genus. Of the 289 plants identified to species, 174 are native (60%) and 115 are non-native (40%). The overall percentage of native species in the study area is low when compared with the percentage of native plant species in the flora of Ontario (77%: Kaiser 1983). This is a reflection of the associated land uses found within the surrounding area including residential, commercial, industrial and agricultural uses. Such land uses influence the extent to which vegetation communities are disturbed, typically related to an increased diversity of non-native and/or invasive species, which ultimately serves to promote the establishment and subsequent dispersal of such species.

Cultural communities and manicured areas have a high proportion of non-native plant species, as is generally the case in areas with regular disturbance activities and areas where the surrounding land use includes development and infrastructure. Overall, such pressures on the natural environment are related to an increased diversity of non-native species with an increased dispersal of these plants.

Forest and wetland communities generally provide higher quality habitat and have a higher occurrence of native plant species that are more specialized. Higher quality vegetation communities with a more diverse range of native species were associated with Bronte Creek and Sixteen Mile Creek, within the Zimmerman Valley Life Science ANSI, and the Sixteen Mile Creek Candidate Life Science ANSI. Several high-quality forested communities are also scattered throughout the western portion of the study area on tableland, and these are typically located within the vicinity of the Oakville-Milton Wetlands and Upland Candidate ANSI.

SPECIES AT RISK

A letter dated September 6, 2017, from the MNRF Aurora District Office confirmed that butternut has been recorded within the vicinity of the study area. Two butternut (*Julans cinera*) trees and numerous seedlings were identified within a woodland associated with the study area. Butternut trees were found only within Segment S3 as confirmed during field investigations. Butternut is a species at risk, listed as Endangered under the Ontario *Endangered Species Act* (*ESA 2007*). No other plant species at risk (Threatened, Endangered, or Special Concern) were identified during 2018 or 2019 field investigations.

Twenty-two plant species considered rare in Peel and/or Halton (Varga 2000; CVC) were identified within several communities associated with the study area. Several species of trees including white spruce and common hackberry (*Celtis occidentalis*) were planted. **Table 3.3** presents a summary of these species with their approximate locations within the study area. All of the species listed in **Table 3.3** have populations that are provincially secure.

Appendix E of this EPR presents correspondence with the MNRF, Conservation Halton and CVC related to terrestrial ecosystems.

SENSITIVITY/SIGNIFICANCE

All of the vegetation communities identified within the study area are considered to be widespread and common in Ontario and secure globally. The Fresh-Moist Sugar Maple-Black Maple Deciduous Forest (FOD6-4) associated with Bronte Creek, is a vulnerable community type provincially ranked as S3. This community contained several regionally rare species. A large number of the vegetation communities identified within the study area are of anthropogenic origin and influence. Cultural vegetation communities found within the study area are considered more tolerant of disturbance and are able to recover quickly post disturbance. Valleylands within the study area are more naturalized and support a greater diversity of native plant species. The forest and wetland communities identified within the study area are considered to be more sensitive features. Efforts should be made to minimize impacts to these features, including the removal of vegetation, to the extent possible.

A number of Areas of Natural and Scientific Interest and Provincially Significant Wetlands are located within the study area. In addition, the upper and lower tier municipalities have identified areas, generally associated with watercourses/valleylands, within the study area as part of their natural heritage/greenlands systems. Provisions should be made to ensure that these sensitive areas are avoided and to prohibit vegetation removals from these areas to the extent possible.

Historic records of butternut and eastern flowering dogwood have been identified within the study area. Botanical field investigations undertaken in 2018 and 2019 confirmed the presence of butternut, but eastern flowering dogwood was not identified during plant surveys. Environmental protection/mitigation measures to protect species at risk and their habitat will be developed later in the design process.

3.1.7. Wildlife and Wildlife Habitat

There are many natural heritage features located within the study area between Brant Street and Hurontario Street, in particular, where watercourses/valleylands and designated natural areas are present. The Bronte Creek, Sixteen Mile Creek, East Sixteen Mile Creek and the Credit River valleylands/tablelands make up much of the highest quality natural heritage features within the vicinity of the study area and provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. These north-south linkages provide increased opportunity for wildlife utilization of habitats within and adjacent to the study area. Deciduous forest habitats present north of the 407 ETR, near Dundas Street, east to Appleby Line, function as important wildlife habitat because of the large and relatively contiguous nature of the natural heritage features. However, these natural areas primarily extend north of 407 ETR, with very limited natural area extending to the south. The Trafalgar Moraine ANSI, situated north of the 47 ETR, between Tremaine Road and Regional Road

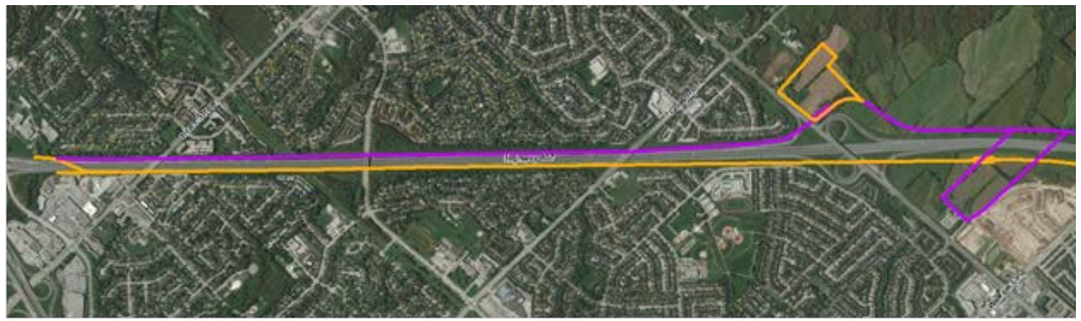
25, is a relatively large, deciduous woodland and marsh community that is also likely to function as important wildlife habitat given its relatively large size. However, this natural area is largely fragmented from surrounding natural areas because of cleared agricultural lands and roads bordering the feature. The Oakville-Milton Wetlands and Upland Candidate ANSI maintains some connectivity to the East Sixteen Mile Creek valleyland and also to natural areas to the south-east. This natural feature is dominated by deciduous forest but also contains inclusions of cultural meadow and savannah habitat types.

A number of aquatic habitats are scattered throughout much of the study area. A loose concentration of aquatic features is associated with the Drumquin Wetland not Provincially Significant Wetland, situated near the Tributary of Sixteen Mile Creek. These aquatic habitats are composed largely of shallow marsh and swamp habitat types. These habitats are likely to function as amphibian breeding habitat and habitat for aquatic/semi-aquatic bird, reptile and mammal species. These features do experience disturbance and fragmentation resulting from extensive agricultural lands and nearby roads. Interspaced between these larger more contiguous natural heritage features are natural and disturbed communities such as cultural meadows, thickets, woodlands, agricultural lands, hedgerows, and several aquatic habitat types (meadow marsh, shallow marsh, swamp, shallow aquatic and open aquatic).

Overall, larger and contiguous natural areas within the study area are restricted to several areas but, where present, are likely to support a moderate to high diversity of wildlife species. A number of north-south running valleylands (Bronte Creek, Sixteen Mile Creek, East Sixteen Mile Creek and Credit River valleylands/tablelands) as described above, as well as designated natural areas and smaller valleylands of the other watercourses located within the study area achieves important habitat connectivity. However, outside of these valleylands and natural areas the landscape is highly disturbed and supports more modest natural heritage features, resulting in the presence of a low to moderate diversity of wildlife species generally considered urban or tolerant of anthropogenic features and disturbance.

A summary of wildlife habitat conditions for each Segment is provided below. Figures presented below for each Segment illustrate the runningway, stations and bus storage yard for Alignment Option 1, shown in purple and Alignment Option 2, shown in orange.

SEGMENT S1: WEST OF BRANT STREET TO EAST OF DUNDAS STREET



Alignment Option 1

Much of the habitat found within this segment consists of cultural meadow/thicket/woodland, deciduous forest, hedgerow, manicured lawns or active agricultural lands. Additionally, there are several small seasonal watercourses also present, including Rambo Creek and its tributary, Tuck Creek and tributariesof Shoreacres Creek. The watercourse valleylands may provide amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife. This segment is located approximately 200 m south of the Nelson Slope Forest, which is a regionally significant, life science area of natural and scientific interest (ANSI).

Alignment Option 2

Much of the habitat within this segment consists of cultural meadow/thicket/woodland, deciduous forest, and some hedgerow. These habitats were found to contain a wildlife assemblage which is generally considered tolerant to human disturbance/anthropogenic influences. Additionally, there are several small seasonal watercourses present, including Tuck Creek, Roseland Creek, Rambo Creek and tributaries, as well as a thicket swamp, which is associated with a tributary of Shoreacres Creek. The watercourse valleylands and thicket swamp may function as higher quality wildlife habitat as it may provide amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

Dundas Street Station Option A

The area associated with Station Option A, north of the 407 ETR is associated with cultural meadow, cultural woodland, hedgerows, a meadow marsh and agricultural lands, which are highly disturbed. These habitats were found to contain a wildlife assemblage that is generally considered tolerant to human disturbance/anthropogenic influences. Tuck Creek, with seasonal flows, bisects Station Option A, however, limited amphibian breeding habitat was observed.

Dundas Street Station Option B

The area associated with Station Option B, south of the 407 ETR is associated with a cultural thicket/cultural woodland, a Willow Mineral Thicket Swamp, hedgerows and agriculture. Cultural

communities within this area are highly disturbed due to local landuses, which includes residential construction. These habitats were found to contain a wildlife assemblage that is generally considered tolerant to human disturbance/anthropogenic influences. A Tributary of Shoreacres Creek bisects the swamp thicket. This swamp may function as higher quality wildlife habitat as it may provide amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

SEGMENT S2: EAST OF DUNDAS STREET TO EAST OF APPLEBY LINE

Alignment Option 1

The runningway in this segment will largely affect cultural meadow, deciduous forest, manicured land, agricultural habitat types and small seasonal watercourses. These habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences. Along with these vegetation communities, this segment contains tributaries of Appleby Creek and Sheldon Creek and Bronte Creek, which runs through the Zimmerman Valley ANSI.

Alignment Option 2

The runningway in this segment will largely affect cultural meadow/thicket, deciduous forest, manicured lands, agricultural habitat types and small seasonal watercourses. These habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences. Along with these vegetation communities, this segment contains tributaries of Appleby Creek and Sheldon Creek, and Bronte Creek, which runs through the Zimmerman Valley ANSI.

Appleby Line Station Option A

Agricultural fields and cultural communities are dominant within the area associated with Station Option A north of the 407 ETR. These habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences.

Appleby Line Station Option B

An agricultural field and cultural meadow dominate the area associated with Station Option B south of the 407 ETR. Along with these vegetation communities, this option contains a tributary of Sheldon Creek which runs adjacent and west of the station footprint. These habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences.

SEGMENT S3: EAST OF APPLEBY LINE TO EAST OF TREMAINE ROAD

Alignment Option 1

This segment is comprised of cultural meadow, deciduous forests, meadow/shallow marsh, agricultural and manicured lands. Along with these vegetation communities, this segment contains areas of natural and scientific interest (ANSI) and candidate ANSI areas: Trafalgar Moraine Earth Science ANSI, and Oakville-Milton Wetlands and Uplands Candidate Life Science ANSI. The Oakville-Milton Wetlands and Uplands Candidate Life Science ANSI supports a diversity of 46 significant faunal species as reported by Natural Heritage Information Centre (2011).

Alignment Option 2

This segment is comprised of cultural meadow/thicket/woodland, deciduous forests, shallow marsh, agricultural and manicured lands. These habitats were found to contain a relatively diverse wildlife assemblage which is characterized by species which inhabit open-country, successional, wooded, aquatic, and anthropogenic habitat types. Additionally, tributaries of the high-quality natural heritage feature, Fourteen Mile Creek, are present throughout the segment. Fourteen Mile Creek provides opportunity for wildlife movement across the local landscape.

SEGMENT S4: EAST OF TREMAINE ROAD TO WEST OF SIXTEEN MILE CREEK

Alignment Option 1

This segment of runningway consists mainly of cultural vegetation communities bordering agricultural and manicured lands. These habitats were found to contain a wildlife assemblage that is considered tolerant to human disturbance/anthropogenic influences. Deciduous forest, and cultural meadow/thicket communities are associated with Fourteen Mile Creek and Sixteen Mile Creek. Sixteen Mile Creek Candidate Life Science ANSI is also present and supports a high concentration of plant species and several vegetation communities that are provincially and regionally rare (Natural Heritage Information Centre 2011).

Alignment Option 2

This segment of runningway consists mainly of cultural vegetation communities bordering agricultural and manicured lands. These habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences. Deciduous forest, and cultural meadow/thicket communities are associated with Fourteen Mile Creek and Sixteen Mile Creek. Sixteen Mile Creek Candidate Life Science ANSI is also present, which supports a high concentration of plant species and several vegetation communities that are provincially and regionally rare (Natural Heritage Information Centre 2011).

A small Reed-canary Grass Meadow Marsh (MAM2-2e) that is complexed as part of the provincially significant North Oakville-Milton West Wetland Complex and edge habitat associated with a Sugar Maple-Oak Deciduous Forest, both within the Sixteen Mile Creek Candidate ANSI, would be impacted within Segment S4. The meadow marsh is unlikely to provide substantial habitat for higher quality wildlife including amphibian breeding habitat, and thus impacts to this habitat would be considered minor.

Bronte Road Station Option A

The area associated with Station Option A south of the 407 ETR and east of Bronte Road (Regional Road 25), is associated with cultural meadow and hedgerows. These habitats were found to contain a wildlife assemblage that is considered tolerant to human disturbance/anthropogenic influences. A shallow marsh is associated with Station Option A. This marsh is dominated by narrow-leaved cattails with a small disturbed upland area around which the wetland has developed. This wetland is associated with a Tributary of Fourteen Mile Creek. This cattail marsh may function as higher quality wildlife habitat as it may provide amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

Bronte Road Station Option B

The area associated with Station Option B, south of the 407 ETR and west of Bronte Road (Regional Road 25) is associated primarily with agricultural lands, hedgerows maintained as wind breaks between agricultural fields, cultural meadow, and shallow marsh that is dominated by common reed. This marsh appears to have developed, in part, due to drainage from adjacent roads with limited capacity to provide amphibian breeding habitat. Overall, habitats associated with Station Option B were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences.

Bronte Road Bus Storage Yard Option

The proposed Bus Storage Yard, south of the 407 ETR and east of Bronte Road (Regional Road 25) outlined in black in the figure above, is primarily associated with agricultural fields and hedgerows maintained as wind breaks, and a shallow marsh. There is also a small, isolated Sugar Maple-Oak Deciduous Forest associate with the Bus Storage Yard Option. Overall, these habitats were found to contain a wildlife assemblage that is considered tolerant to human disturbance/anthropogenic influences.

SEGMENT S5: WEST OF SIXTEEN MILE CREEK TO EAST OF TRAFALGAR RD

Alignment Options 1 & 2 (Overlapped)

The majority of the habitat in this segment consists largely of agricultural lands, cultural meadow and cultural woodland communities, as well as deciduous forests, manicured lands, hedgerow, and stormwater management ponds. However, this segment also consists of several watercourse crossings of East Sixteen Mile Creek and Joshua's Creek, which also feed into the provincially significant North Oakville-Milton East Wetland Complex (PSW) and Oakville-Milton Wetlands and Uplands Candidate ANSI

(Life Science Provincial). Several small wetlands that are complexed with the PSW are present throughout Segment S5 within agricultural and deciduous forest communities. Sixteen Mile Creek Candidate ANSI and several parts of the Oakville-Milton Wetlands and Uplands Candidate ANSI are present throughout the segment as well.

Trafalgar Road Station Option

The area associated with the Trafalgar Road Station Option south of the 407 ETR and west of Trafalgar Road is associated with agricultural fields and hedgerows, cultural meadow and manicured areas associated with the GO Transit Carpool Parking Lot where the wildlife assemblage is considered tolerant to human disturbance/anthropogenic influences. A portion of a Oak-Hickory Deciduous Forest and a small shallow marsh are also associated with this station option. These vegetation communities support a high diversity of plant and wildlife habitat. These natural areas are contiguous with forest to the west, the southern portion of which is part of the Oakville-Milton Wetlands and Uplands Provincial Candidate Life Science ANSI.

Trafalgar Road Bus Storage Yard Option

The area associated with the proposed Trafalgar Road Bus Storage Yard located south of the 407 ETR and east of Trafalgar Road, outlined in black in the figure above, is comprised primarily of agricultural fields, cultural meadow, and a shallow marsh and cultural woodland that are associated with a single residence. Within these areas the wildlife assemblage is considered tolerant to human disturbance/anthropogenic influences. The shallow marsh community may provide amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

SEGMENT S6: EAST OF TRAFALGAR ROAD TO NORTH OF LOWER BASE LINE

Alignment Option 1

Wildlife habitat in this segment consists almost entirely of cultural meadows/woodlands, agricultural lands, hedgerow and manicured grass. Additionally, there are some deciduous forest lands and cultural thicket. This segment contains a very high level of disturbance and few natural heritage features that provide limited habitat for wildlife, with the exception of watercourses from tributaries of Joshua's Creek.

Alignment Option 2

Wildlife habitat in this segment consists almost entirely of cultural meadows/woodlands, agricultural lands, hedgerow and manicured grass. This segment contains a very high level of disturbance and few natural heritage features that provide habitat for wildlife, with the exception of watercourses from tributaries of Joshua's Creek.

SEGMENT S7: NORTH OF LOWER BASE LINE TO NORTH OF BRITANNIA ROAD

Alignment Options 1 and 2

Most of the land within this segment is comprised of deciduous forests, cultural meadow/thicket/savannah, agricultural/manicured lands, hedgerow and stormwater management ponds. Tributaries of East Sixteen Mile Creek are also present throughout the segment area, which feed into open aquatic vegetation communities. The East Sixteen Mile Creek valleyland is expected to function as a locally significant wildlife movement corridor because of the linear natural areas associated with the feature in an otherwise highly disturbed landscape.

Britannia Road Station Option A

Cultural meadow dominates the area associated with Station A, south of Britannia Road and east of the 407 ETR. Within this station option there is also a residential unit with manicured areas, and meadow marsh communities that are typically associated with a Tributary of East Sixteen Mile Creek. Despite the presence of the meadow marsh, amphibian breeding habitat is not likely present within the Option A footprint. However, the East Sixteen Mile Creek valleyland is expected to function as a locally significant

wildlife movement corridor because of the linear natural areas associated with the feature in an otherwise highly disturbed landscape.

Britannia Road Station Option B

Cultural meadow, manicured areas, disturbed areas associated with commercial development, and a small meadow marsh, and a small shallow marsh are present within the Option B footprint. There may be opportunities for amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife within these marsh communities that are associated with a Tributary of East Sixteen Mile Creek in the northern portion of the Option B footprint. In addition, the East Sixteen Mile Creek valleyland is expected to function as a locally significant wildlife movement corridor because of the linear natural areas associated with the feature in an otherwise highly disturbed landscape.

SEGMENT S8: NORTH OF BRITANNIA RD TO NORTH OF DERRY RD

Alignment Option 1

The majority of the habitat in this segment consists of agricultural/manicured lands, hedgerow, cultural meadows/thicket/woodlands and deciduous forests. The segment is also comprised of several aquatic features, including shallow marsh, thicket swamp, stormwater management ponds, as well as the more sensitive tributaries of East Sixteen Mile Creek. As mentioned in Segment S7, the East Sixteen Mile Creek valleyland acts as a high-quality natural heritage feature within this segment and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. The swamp features may function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife. However, these habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences.

Alignment Option 2

The majority of the habitat in this segment consists of agricultural/manicured lands, hedgerow, cultural meadows/thicket/woodlands and deciduous forests. The segment is also comprised of several aquatic features, including shallow marsh, thicket swamp, stormwater management ponds, as well as the more sensitive tributaries of East Sixteen Mile Creek. As mentioned in Segment S7, the East Sixteen Mile Creek valleyland acts as a high-quality natural heritage feature within this segment and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. The swamp features may function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife. However, these habitats were found to contain a wildlife assemblage which is considered tolerant to human disturbance/anthropogenic influences.

Derry Road Station Option A

Cultural meadow, wetland and manicured areas are dominant within the Station Option A footprint north of Derry Road and east of the 407 ETR. Within this station footprint there is a former residential unit with manicured areas and planted trees, a hedgerow, meadow marsh and swamp thicket that are associated with Tributary of East Sixteen Mile Creek. Overall, these vegetation communities are influenced by local land use practices including former agricultural land use and infrastructure. As mentioned in Segment S7, the East Sixteen Mile Creek valleyland acts as a high-quality natural heritage feature within this segment and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. The wetland features may function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife. However, these habitats were found to contain a wildlife assemblage, which is considered tolerant to human disturbance/anthropogenic influences.

Derry Road Station Option B

A large deciduous forest and cultural meadow were identified within the Station Option B footprint, south of Britannia Road. The deciduous forest is connected to two other forest fragments that have been bisected by driveways. This forest appears to be in good condition and likely contains habitat for a diverse variety of plants and wildlife. As previously noted, the East Sixteen Mile Creek valleyland acts as a high-quality natural heritage feature within this segment and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area.

SEGMENT S9: NORTH OF DERRY ROAD TO WEST OF HERITAGE ROAD

Alignment Option 1

This alignment option in Segment S9, of which a portion passes through a hydro corridor where the runningway will be constructed underground (tunnel), contains wildlife habitat primarily within vegetation communities such as cultural meadow, hedgerow, agricultural and manicured fields. Aquatic features are also present, such as shallow marsh, meadow marsh, reed-canary grass mineral meadow marsh, and cattail mineral shallow marsh, which are associated tributaries of East Sixteen Mile Creek. As mentioned in Segment S8, the East Sixteen Mile Creek valleyland is a high-quality natural heritage feature within this segment and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. The wetland and swamp features may also function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

Alignment Option 2

This alignment option in Segment S9, east and then south of the 407 ETR, contains wildlife habitat primarily within vegetation communities such as cultural meadow, hedgerow, agricultural and manicured fields. Aquatic features are also present, such as shallow marsh, meadow marsh, reed-canary grass mineral meadow marsh, and cattail mineral shallow marsh, which are associated tributaries of East Sixteen Mile Creek. As mentioned in Segment S8, the East Sixteen Mile Creek valleyland is a high-quality natural heritage feature within this segment and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. The wetland and swamp features may also function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

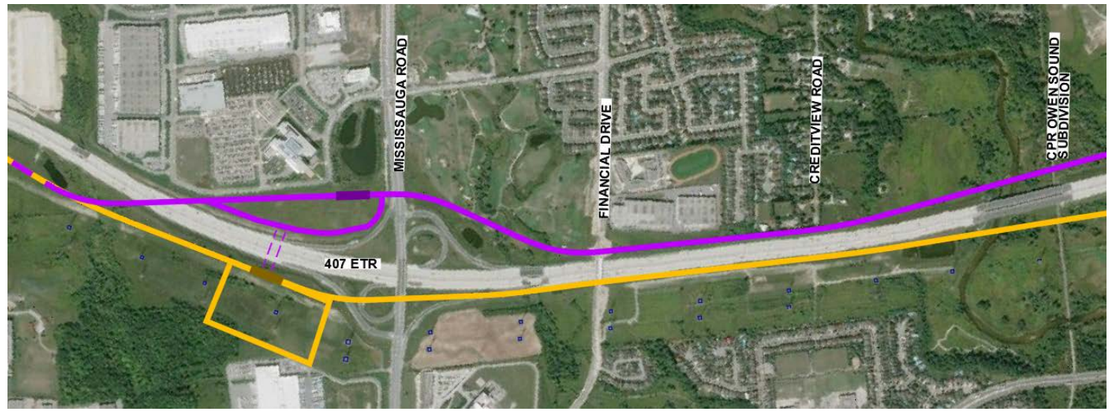
Winston Churchill Boulevard Station Option

Cultural meadow, manicured areas, an area of disturbance associated with a horse stable, and a small shallow marsh dominate the Winston Churchill Blvd Station Option footprint, east of Meadowpine Blvd. The wetland feature may also function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife, otherwise, the wildlife assemblage associated with this area is considered tolerant to human disturbance/anthropogenic influences.

Winston Churchill Boulevard Bus and Storage Yard

Agricultural fields, manicured areas associated with a driving range, and cultural meadow, and two shallow marsh communities are located within the Bus Storage Yard footprint, outlined in black in the figure above. The shallow marshes are associated with a Tributary of East Sixteen Mile Creek. Wetland features may also function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife, otherwise, the wildlife assemblage associated with the Bus Storage Yard footprint is considered tolerant to human disturbance/anthropogenic influences. However, as noted in Segment S8, the East Sixteen Mile Creek valleyland acts as a high-quality natural heritage feature and can provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area.

SEGMENT S10: WEST OF HERITAGE RD TO EAST OF CREDIT RIVER



Alignment Option 1

Much of the habitat within this segment consists of cultural meadow/woodland/thicket communities, manicured land and storm ponds. This segment also contains watercourse crossings from Mullet Creek, Levi's Creek and the Credit River.

Alignment Option 2

Much of the habitat within this segment consists of agricultural or manicured land, cultural meadow/woodland/thicket communities, stormwater management ponds, and deciduous forest. Mineral meadow marsh is also present, as the segment contains watercourses from Mullet Creek, Levi's Creek and the Credit River. The watercourses and marsh meadow communities may contain higher quality wildlife habitat, as it may function as amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife.

At the east end of Segment S10, east of the Credit River, the runningway for both options impact the northern edge of a meadow marsh community that is part of the provincially significant Churchville-Norval Wetland Complex. Though this is edge habitat, there may be functional amphibian breeding habitat and habitat for aquatic or semi-aquatic wildlife present.

A change to this segment has been made since the initial analysis of Alignment Option 1 and Alignment Option 2. This was due to new information received regarding existing archaeological potential south of the 407 ETR around Credit River area. The change consists of the crossing the Credit River on the north side of the 407 ETR. The change is presented in Chapter 6.

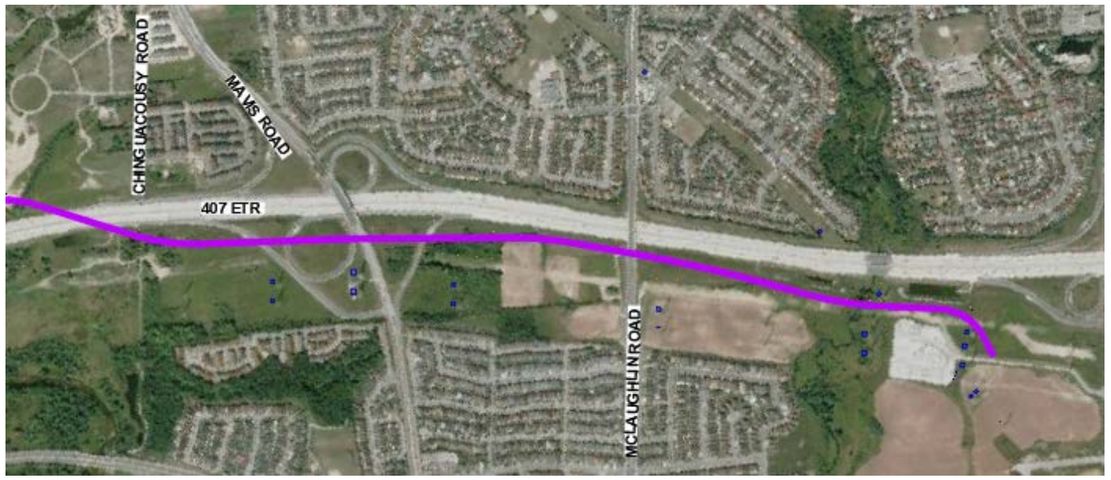
Mississauga Station Option A

Cultural meadow and manicured areas are dominant within the Station Option A footprint north of the 407 ETR. The wildlife assemblage associated with this area is considered tolerant to human disturbance/anthropogenic influences.

Mississauga Station Option B

Cultural meadow is dominant within the Station Option B footprint south of the 407 ETR. There is also a forested community associated with an Environmentally Significant Area at the very southwest corner of the Option B footprint that would be impacted. The forest community provides habitat for a wide range of plants and wildlife.

SEGMENT S11: EAST OF CREDIT REVIER TO WEST OF HURONTARIO STREET



Alignment Options 1 and 2

The majority of the habitat in this segment consists largely of agricultural fields, cultural meadow communities, cultural thicket and woodland communities, stormwater management ponds with a minor lowland forest component. This segment also contains watercourses from the Credit River and Fletcher's Creek, there are also aquatic vegetation communities associated with these watercourses, such as reed-canary grass mineral meadow marsh, and cattail mineral shallow marsh.

A meadow marsh community at the west end of Segment S11 is also associated with the provincially significant Churchville-Norval Wetland Complex. The runningway for both Options 1 and 2 will impact the northern edge of this wetland community which may contain functional breeding amphibian habitat and habitat for aquatic or semi-aquatic wildlife present.

Flora

Detailed field work has been undertaken along the 407 Transitway in 2018 and 2019 to document species presence within the study area. A total of 304 plant species were recorded within the study area, however, 15 of these plants could only be identified to genus. Of the 289 plants identified to species, 174 are native (60%) and 115 are non-native (40%). The overall percentage of native species in the study area is low when compared with the percentage of native plant species in the flora of Ontario. This is a reflection of the associated land uses found within the surrounding area including residential, commercial, industrial and agricultural uses. Such land uses influence the extent to which vegetation communities are disturbed, typically related to an increased diversity of non-native and/or invasive species, which ultimately serves to promote the establishment and subsequent dispersal of such species.

Cultural communities and manicured areas have a high proportion of non-native plant species, as is generally the case in areas with regular disturbance activities and areas where the surrounding land use includes development and infrastructure. Overall, such pressures on the natural environment are related to an increased diversity of non-native species with an increased dispersal of these plants.

Forest and wetland communities generally provide higher quality habitat and have a higher occurrence of native plant species that are more specialized. Higher quality vegetation communities with a more diverse range of native species were associated with Bronte Creek and Sixteen Mile Creek, within the Zimmerman Valley Life Science ANSI, and the Sixteen Mile Creek Candidate Life Science ANSI. Several high-quality forested communities are also scattered throughout the western portion of the study area on tableland, and these are typically located within the vicinity of the Oakville-Milton Wetlands and Upland Candidate ANSI.

Species at Risk

A letter dated September 6, 2017, from the MNRF Aurora District Office confirmed that butternut has been recorded within the vicinity of the study area. Two butternut (Julans cinera) trees and numerous seedlings were identified within a woodland associated with the study area. Butternut trees were found only within Segment S3 as confirmed during field investigations. Butternut is a species at risk, listed as Endangered under the Ontario *Endangered Species Act* (ESA 2007). No other plant species at risk (Threatened, Endangered, or Special Concern) were identified during 2018 or 2019 field investigations.

Twenty-two plant species considered rare in Peel and/or Halton were identified within several communities associated with the study area. Several species of trees including white spruce and common hackberry (Celtis occidentalis) were planted. For more details, please see **Appendix E** of this report.

WILDLIFE COMMUNITIES

There are many natural heritage features located within the study area between Brant Street and Hurontario Street, in particular, where watercourses/valleylands and designated natural areas are present. The Bronte Creek, Sixteen Mile Creek, East Sixteen Mile Creek and the Credit River valleylands/tablelands make up much of the highest quality natural heritage features within the vicinity of the study area and provide important north-south movement opportunity/linkages for wildlife within, or in the immediate vicinity of the study area. These north-south linkages provide increased opportunity for wildlife utilization of habitats within and adjacent to the study area. Deciduous forest habitats present north of the 407 ETR, near Dundas Street, east to Appleby Line, function as important wildlife habitat because of the large and relatively contiguous nature of the natural heritage features. However, these natural areas primarily extend north of 407 ETR, with very limited natural area extending to the south. The Trafalgar Moraine ANSI, situated north of the 47 ETR, between Tremaine Road and Regional Road 25, is a relatively large, deciduous woodland and marsh community that is also likely to function as important wildlife habitat given its relatively large size. However, this natural area is largely fragmented from surrounding natural areas because of cleared agricultural lands and roads bordering the feature. The Oakville-Milton Wetlands and Upland Candidate ANSI maintains some connectivity to the East Sixteen Mile Creek valleyland and also to natural areas to the south-east. This natural feature is dominated by deciduous forest but also contains inclusions of cultural meadow and savannah habitat types.

A number of aquatic habitats are scattered throughout much of the study area. A loose concentration of aquatic features is associated with the Drumquin Wetland not Provincially Significant Wetland, situated near the Tributary of Sixteen Mile Creek. These aquatic habitats are composed largely of shallow marsh and swamp habitat types. These habitats are likely to function as amphibian breeding habitat and habitat for aquatic/semi-aquatic bird, reptile and mammal species. These features do experience disturbance and fragmentation resulting from extensive agricultural lands and nearby roads. Interspaced between these larger more contiguous natural heritage features are natural and disturbed communities such as cultural meadows, thickets, woodlands, agricultural lands, hedgerows, and several aquatic habitat types (meadow marsh, shallow marsh, swamp, shallow aquatic and open aquatic).

Overall, larger and contiguous natural areas within the study area are restricted to several areas but, where present, are likely to support a moderate to high diversity of wildlife species. A number of north-south running valleylands (Bronte Creek, Sixteen Mile Creek, East Sixteen Mile Creek and Credit River valleylands/tablelands) as described above, as well as designated natural areas and smaller valleylands of the other watercourses located within the study area achieves important habitat connectivity. However, outside of these valleylands and natural areas the landscape is highly disturbed and supports more modest natural heritage features, resulting in the presence of a low to moderate diversity of wildlife species generally considered urban or tolerant of anthropogenic features and disturbance. For futher details of wildlife habitat within the study area, **Appendix E** presents a description of the wildlife habitat per segment.

WILDLIFE SPECIES

A list of wildlife recorded within habitats along the 407 Transitway corridor is presented in **Table 3.4.** A total of 161 wildlife species have been recorded from secondary source data and during LGL's field observations including 11 herpetofauna, 135 birds and 14 mammals. Based on LGL's field investigations conducted along the preferred Transitway alignment and in the vicinity of the potential station locations (and adjacent lands up to 120 m (north and south) from the future infrastructure footprint), 81 of the 149 wildlife species were verified to include five herpetofauna, 63 bird, and 13 mammal species. Most of the species observed were birds identified through calls and sightings, with more modest numbers of herpetofauna and mammal species recorded. **Table 3.4** also includes records of wildlife species which have been documented within, or in the vicinity of, the study area, through secondary data sources.

Birds

Breeding bird surveys were conducted by LGL on several dates during the 2018 and 2019 breeding bird season to document breeding bird evidence (BBE) and to characterize the nature, extent and significance of breeding bird usage of the habitats within the study area. Breeding bird survey methodology and breeding bird behaviours used as evidence of breeding success were categorized according to the Breeding Bird Atlas. Locations of the breeding bird point count stations are shown on **Figures 3.2a to 3.2f**. Generally, breeding bird survey stations were established within natural areas (e.g. creek valleyland, forests, etc.) or where potential species at risk habitat was identified (e.g. grasslands). Areas not surveyed using the above-mentioned protocol were surveyed using informal wandering transects and BBE collected were treated as incidental. Additional species identified during passive bird surveys are presented in **Table 3.4.**

Eighty-four bird species were identified as previously recorded in the immediate vicinity of the study area based on data provided by Credit Valley Conservation (CVC), while Conservation Halton (CH) recorded 114 bird species. A total of 143 bird species were identified as having the potential to be present within the vicinity of the study area based on 10 x 10 km Breeding Bird Atlas data. The bird assemblage identified within the Breeding Bird Atlas data represents a wide-array of habitat types, including (but not limited to) open-country/agricultural, grassland, thicket, deciduous forest, coniferous forest, mixed forest, interior forest, forest edge, wetland, aquatic and anthropogenic. However, as the Breeding Bird Atlas data extends well beyond the limits of the study area (i.e., 10 x 10 km squares), some of the species identified may not be representative of the habitat types present within the study area. As a result, the bird assemblage represented within the CVC and CH data is considered more representative of the habitat types found within the study area. Furthermore, LGL's 2018 and 2019 survey results provided additional data on the bird assemblage found within the study area.

TABLE 3.4: WILDLIFE SPECIES DOCUMENTED WITHIN THE STUDY AREA BY LGL AND SECONDARY SOURCE DATA

WILDLIFE	SCIENTIFIC NAME	COMMON NAME	SPECIES STATUS UNDER LEGISLATION/ LOCAL SENSITIVITY				SOURCE OF SPECIES IDENTIFICATION	
			CANADA SARA	ONTARIO ESA	LEGAL STATUS	LOCAL	LGL[1]	SECONDARY SOURCE[2]
Herpetofauna	*Anaxyrus americanus*	American Toad					*	*
	Lithobates catesbeianus	American Bullfrog			FWCA(P)			*
	Hyla versicolor	Gray Treefrog			FWCA(P)		*	
	Pseudacris triseriata	Western Chorus Frog	THR	-				*
	Lithobates sylvatica	Wood Frog					*	*
	Lithobates pipiens	Northern Leopard Frog						*
	Lithobates clamitans	Green Frog					*	*
	Plethodon cinereus	Red-backed Salamander			FWCA(P)			*
	Storeria dekayi	Brownsnake						*
	Thamnophis sirtalis sirtalis	Eastern Gartersnake					*	*
	Chelydra serpentina	Snapping Turtle	SC	SC	FWCA(P)			*
Birds	*Aix sponsa*	Wood Duck			MBCA		*	*
	Anas platyrhynchos	Mallard			MBCA		*	*
	Maleagris gallopavo	Wild Turkey			FWCA(P)		*	
	Ardea herodias	Great Blue Heron			MBCA		*	
	Accipiter cooperii	Cooper's Hawk			FWCA(P)			*
	Buteo jamaicensis	Red-tailed Hawk			FWCA(P)		*	*
	Falco sparverius	American Kestrel			FWCA(P)			*
	Charadrius vociferus	Killdeer			MBCA		*	*
	Actitis macularius	Spotted Sandpiper			MBCA		*	*
	Scolopax minor	American Woodcock			MBCA			*
	Tringa solitaria	Solitary Sandpiper			-			*
	Otus asio	Eastern Screech-owl			FWCA(P)			*
	Chaetura pelagica	Chimney Swift	THR	THR	MBCA			*
	Columba livia	Rock Dove			-		*	*
	Zenaida macroura	Mourning Dove			MBCA		*	*
	Picoides pubescens	Downy Woodpecker			MBCA		*	*
	Picoides villosus	Hairy Woodpecker			MBCA		*	*
	Colaptes auratus	Northern Flicker			MBCA		*	*
	Tyrannus tyrannus	Eastern Kingbird			MBCA		*	*
	Myiarchus crinitus	Great-crested Flycatcher			MBCA		*	*
	Empidonax minimus	Least Flycatcher			MBCA		*	
	Contopus virens	Eastern Wood Pewee	SC	SC	MBCA		*	*
	Empidonax traillii	Willow Flycatcher			MBCA		*	*
	Vireo gilvus	Warbling Vireo			MBCA		*	*
	Vireo olivaceus	Red-eyed Vireo			MBCA	INT	*	*
	Ceryle alcyon	Belted Kingfisher			MBCA		*	*

WILDLIFE	SCIENTIFIC NAME	COMMON NAME	SPECIES STATUS UNDER LEGISLATION/ LOCAL SENSITIVITY				SOURCE OF SPECIES IDENTIFICATION	
			CANADA SARA	ONTARIO ESA	LEGAL STATUS	LOCAL	LGL[1]	SECONDARY SOURCE[2]
	Coccyzus erythropthalmus	Black-billed Cuckoo			MBCA			*
	Polioptila caerulea	Blue-grey Gnatcatcher			MBCA			*
	Sayornis phoebe	Eastern Phoebe			MBCA		*	*
	Cyanocitta cristata	Blue Jay			FWCA (P)		*	*
	Bubo scandiacus	Snowy Owl			FWCA (P)			*
	Corvus brachyrhynchos	American Crow			MBCA		*	*
	Eremophila alpestris	Horned Lark			MBCA		*	*
	Stelgidoptery x serripennis	Northern Rough-winged Swallow			MBCA		*	*
	Hirundo rustica	Barn Swallow		THR	MBCA		*	*
	Tachycineta bicolor	Tree Swallow			MBCA			*
	Petrochelidon pyrrhonota	Cliff Swallow			MBCA		*	*
	Poecile atricapillus	Black-capped Chickadee			MBCA		*	*
	Sitta carolinensis	White-breasted Nuthatch			MBCA	SWH	*	*
	Hylocichla mustelina	Wood Thrush	THR	SC	MBCA			*
	Catharus guttatus	Hermit Thrush			MBCA			*
	Catharus ustulatus	Swainson's Thrush			MBCA			*
	Turdus migratorius	American Robin			MBCA		*	*
	Dumetella carolinensis	Gray Catbird			MBCA		*	*
	Mimus polyglottos	Northern Mockingbird			MBCA			*
	Sturnus vulgaris	European Starling			-		*	*
	Bombycilla garrulus	Cedar Waxwing			MBCA		*	*
	Dendroica petechia	Yellow Warbler			MBCA		*	*
	Geothlypis philadelphia	Mourning Warbler			MBCA		*	*
	Seiurus aurocapilla	Ovenbird			MBCA	SWH/INT		*
	Setophaga ruticilla	American Redstart			MBCA	SWH		*
	Geothlypis trichas	Common Yellowthroat			MBCA		*	*
	Spizella passerina	Chipping Sparrow			MBCA		*	*
	Spizella pusilla	Field Sparrow			MBCA		*	*
	Passerculus sanwichensis	Savannah Sparrow			MBCA	SWH/L4	*	*
	Melospiza georgiana	Swamp Sparrow			MBCA		*	*
	Melospica melodia	Song Sparrow			MBCA		*	*
	Cardinalis cardinalis	Northern Cardinal			MBCA		*	*
	Dendroica palmarum	Palm Warbler			MBCA			*
	Pheucticus ludovicianus	Rose-breasted Grosbeak			MBCA		*	*
	Pandion haliaetus	Osprey			FWCA(P)			*
	Passerina cyanea	Indigo Bunting			MBCA		*	*
	Dolichonyx oryzivorus	Bobolink	THR	THR	MBCA		*	*
	Agelaius phoeniceus	Red-winged Blackbird			-		*	*

WILDLIFE	SCIENTIFIC NAME	COMMON NAME	SPECIES STATUS UNDER LEGISLATION/ LOCAL SENSITIVITY				SOURCE OF SPECIES IDENTIFICATION	
			CANADA SARA	ONTARIO ESA	LEGAL STATUS	LOCAL	LGL[1]	SECONDARY SOURCE[2]
	Sturnella magna	Eastern Meadowlark	THR	THR	MBCA		*	*
	Melospiza lincolnii	Lincoln's Sparrow			MBCA			*
	Quiscalus quiscula	Common Grackle			-		*	*
	Molothrus ater	Brown-headed Cowbird			-		*	*
	Icterus spurius	Orchard Oriole			MBCA			*
	Icterus galbula	Baltimore Oriole			MBCA		*	*
	Carpodacus mexicanus	House Finch			MBCA			*
	Carduelis tristis	American Goldfinch			MBCA		*	*
	Passer domesticus	House Sparrow			-		*	*
	Setophaga americana	Northern Parula			MBCA			*
	Larus delawarensis	Ring-billed Gull			MBCA		*	*
	Larus minutus	Little Gull			-			*
	Ardea herodias	Great Blue Heron			MBCA		*	*
	Sitta canadensis	Red-breasted Nuthatch			MBCA		*	*
	Regulus calendula	Ruby-crowned Kinglet			MBCA		*	*
	Troglodytes aedon	House Wren			MBCA		*	*
	Riparia riparia	Bank Swallow			MBCA			*
	Mniotilta varia	Black and White Warbler			MBCA			*
	Setophaga virens	Black-throated Green Warbler			MBCA			*
	Dendroica fusca	Blackburnian Warbler			MBCA			*
	Dendroica caerulescens	Black-throated Blue Warbler			MBCA			*
	Vermivora cyanoptera	Blue-winged Warbler			MBCA			*
	Vermivora peregrina	Tennessee Warbler			MBCA			*
	Certhia americana	Brown Creeper			MBCA			*
	Toxostoma rufum	Brown Thrasher			MBCA		*	*
	Zonotrichia leucophrys	White-crowned Sparrow			MBCA			*
	Branta canadensis	Canada Goose			MBCA		*	*
	Thryothorus ludovicianus	Carolina Wren			MBCA			*
	Setophaga pensylvanica	Chestnut-sided Warbler			MBCA			*
	Chordeiles minor	Common Nighthawk	SC	-	MBCA			*
	Junco hyemalis	Dark-eyed Junco			MBCA		*	*
	Dendroica discolor	Prairie Warbler			MBCA			*
	Sialia sialis	Eastern Bluebird			MBCA			*
	Pipilo erythrophthalmus	Eastern Towhee			MBCA		*	*
	Regulus satrapa	Golden-crowned Kinglet			MBCA			*
	Ammodramus savannarum	Grasshopper Sparrow	SC	SC	MBCA			*
	Bubo virginianus	Great Horned Owl			FWCA(P)			*
	Tringa flavipes	Lesser Yellowlegs			MBCA			*

WILDLIFE	SCIENTIFIC NAME	COMMON NAME	SPECIES STATUS UNDER LEGISLATION/ LOCAL SENSITIVITY				SOURCE OF SPECIES IDENTIFICATION	
			CANADA SARA	ONTARIO ESA	LEGAL STATUS	LOCAL	LGL[1]	SECONDARY SOURCE[2]
	Tringa melanoleuca	Greater Yellowlegs			MBCA			*
	Butorides virescens	Green Heron			MBCA			*
	Larus argentatus	Herring Gull			MBCA			*
	Setophaga magnolia	Magnolia Warbler			MBCA			*
	Cistothorus palustris	Marsh Wren			MBCA			*
	Vireo philadelphicus	Philadelphia Vireo			MBCA			*
	Leiothlypis ruficapilla	Nashville Warbler			MBCA			*
	Circus cyaneus	Northern Harrier			FWCA(P)			*
	Wilsonia canadensis	Canada Warbler	THR	SC	MBCA			*
	Lanius excubitor	Northern Shrike			MBCA			*
	Parkesia noveboracensis	Northern Waterthrush			MBCA			*
	Falco peregrinus	Peregrine Falcon	THR	SC	FWCA(P)			*
	Dendroica coronata	Yellow-rumped Warbler			MBCA			*
	Dryocopus pileatus	Pileated Woodpecker			MBCA		*	*
	Setophaga pinus	Pine Warbler			MBCA			*
	Haliaeetus leucocephalus	Bald Eagle	-	SC	FWCA(P)			*
	Melanerpes carolinus	Red-bellied Woodpecker			MBCA			*
	Buteo lineatus	Red-shouldered Hawk			FWCA(P)			*
	Archilochus colubris	Ruby-throated Hummingbird			MBCA			*
	Bonasa umbellus	Ruffed Grouse			FWCA(G), MBCA			*
	Gallinago delicata	Wilson's Snipe			MBCA			*
	Piranga olivacea	Scarlet Tanager			MBCA			*
	Accipiter striatus	Sharp-shinned Hawk			FWCA(P)			*
	Buteo lagopus	Rough-legged Hawk			FWCA(P)			*
	Cathartes aura	Turkey Vulture			FWCA(P)		*	*
	Catharus fuscescens	Veery			MBCA			*
	Pooecetes gramineus	Vesper Sparrow			MBCA			*
	Chlidonias niger	Black Tern	-	SC	MBCA			*
	Zonotrichia albicollis	White-throated Sparrow			MBCA			*
	Troglodytes hiemalis	Winter Wren			MBCA			*
	Sphyrapicus varius	Yellow-bellied Sapsucker			MBCA			*
	Coccyzus americanus	Yellow-billed Cuckoo			MBCA			*
	Vireo flavifrons	Yellow-throated Vireo			MBCA			*
Mammals	*Blarina brevicauda*	N. Short-tailed Shrew			FWCA(P)		*	
	Tamias striatus	Eastern Chipmunk			FWCA(P)		*	*
	Sylvilagus floridanus	Eastern Cottontail			FWCA(G)		*	*
	Marmota monax	Groundhog			-			*
	Sciurus carolinensis	Eastern Gray Squirrel			FWCA(G)		*	

WILDLIFE	SCIENTIFIC NAME	COMMON NAME	SPECIES STATUS UNDER LEGISLATION/ LOCAL SENSITIVITY				SOURCE OF SPECIES IDENTIFICATION	
			CANADA SARA	ONTARIO ESA	LEGAL STATUS	LOCAL	LGL[1]	SECONDARY SOURCE[2]
	Tamiasciurus hudsonicus	Red Squirrel			FWCA(F)		*	
	Castor canadensis	Beaver			FWCA(F)		*	*
	Microtus pennsylvanicus	Meadow Vole			-		*	
	Neovison vison	American Mink			FWCA(F)		*	*
	Procyon lotor	Northern Racoon			FWCA(F)		*	
	Canis latrans	Coyote			FWCA(F)		*	
	Ondatra zibethica	Muskrat			FWCA(F)		*	*
	Mephitis mephitis	Striped Skunk			FWCA(F)		*	
	Odocoileus virginianus	White-tailed Deer			FWCA(G)		*	*

SARA – federal *Species at Risk Act*:
END - Endangered
THR – Threatened
SC - Special Concern

ESA - *Ontario Endangered Species Act*, 2007
END – Endangered
THR – Threatened
SC - Special Concern

Source of Species Identification:
[1]Species recorded within the study area during field investigations (LGL 2018/2019).
[2]Species identified by secondary source data, including Ontario Reptile and Amphibian Atlas, CH and CVC.

Other:
Significant Wildlife Habitat Technical Guide:
SWH – Area Sensitive Species
INT - Interior Species
For definitions of species ranks, refer to **Appendix E.**

Legal Status:
MBCA - *Migratory Birds Convention Act*
ESA - *Endangered Species Act, 2007*
SARA - *Species at Risk Act*
FWCA - *Fish and Wildlife Conservation Act*
(P) Protected Species (G) Game species (F) Furbearing mammals

The study area contained a moderate number of breeding bird species representing a variety of habitat types. Breeding evidence was obtained during LGL's field investigations/surveys for 48 species of birds. Breeding evidence was confirmed in 11 species, considered probable in 26 species, and possible for the remaining 11 species. Confirmed breeding by bird species was generally documented based on adults returning to nests, typically under bridge structures associated with 407 ETR or on structures associated with residential areas or agricultural lands. Species confirmed to be breeding include Barn Swallow (*Hirundo rustica*), Cliff Swallow (*Petrochelidon pyrrhonota*) and Eastern Kingbird (*Tyrannus tyrannus*). Although no Osprey (*Pandion haliaetus*) were observed during LGL's survey, one nest was observed which may be incidental evidence of breeding behaviour. A number of species (26 total) were identified as suspected/probable breeders based on BBE such as a territory being established, or agitated behaviour exhibited by individuals. Some of these species include Song Sparrow (*Melospica melodia*), American Robin (*Turdus migratorius*), and Warbling Vireo (*Vireo gilvus*). Species that were most commonly encountered across the study area were generally species associated with open country/agricultural, anthropogenic areas, forest/forest edge and aquatic habitat types.

Nine bird species at risk were identified by secondary source data and four of these species were confirmed during LGL's 2018 and 2019 surveys (Eastern Wood Pewee, Barn Swallow, Bobolink and Eastern Meadowlark). There are also multiple species that are considered area-sensitive and/or interior species according to the *Significant Wildlife Habitat Technical Guide* (MNR 2000). A number of bird species identified within the study area are protected under the *Migratory Birds Convention Act* (MBCA) and/or the *Fish and Wildlife Conservation Act*.

Herpetofauna

Methodologies outlined in the Marsh Monitoring Program (2000) were applied to confirm the presence of anuran species, document potential breeding habitat/areas, and confirm the nature, extent and significance of amphibian usage. Twenty stations were strategically placed throughout the study area where amphibian breeding habitat was suspected (based on aerial photo interpretation and field review) and where access was permitted. Anuran surveys were conducted on three separate occasions during the spring and summer of 2019. Due to the large study area, consecutive nights were required to complete the survey in its entirety. Each survey was conducted during appropriate weather conditions,

beginning one half hour after sunset and concluding just prior to midnight. Surveys were completed during periods of peak anuran breeding activity and vocalization. Anuran breeding evidence was documented for five species during the 2019 surveys. Vocalizing male American Toad (*Anaxyrus americanus*), Green Frog (*Lithobates clamitans*), Gray Tree Frog (*Hyla versicolor*), Western Chorus Frog (*Pseudacris triseriata*) and Spring Peeper (*Pseudacris crucifer*) were noted within the study area, or in the immediate vicinity of the study area.

Overall, most aquatic habitats identified throughout the study area displayed evidence of amphibian breeding during the 2019 survey periods. Amphibian breeding behaviour was observed in the following locations:

- Tributary of Shoreacres Creek (east of 407 ETR north of Dundas Street);
- Tributary of Shoreacres Creek (east of 407 ETR, south of Walkers Line);
- two Tributaries of Sheldon Creek (east of 407 ETR, west of Palladium Way);
- Tributary of Sheldon Creek (west of 407 ETR, south of Appleby Line);
- Stormwater Management Pond (west of 407 ETR, north of Appleby Line off-ramp);
- Bronte Creek crossing (east of 407 ETR);
- Stormwater Management Pond (east of 407 ETR, north of Bronte Creek crossing);
- Tributary of Fourteen Mile Creek (west of 407 ETR, north of Tremaine Road at Truck Inspection Station);
- Sixteen Mile Creek (east of 407 ETR);
- Stormwater Management Pond (east of 407 ETR, south of Sixteen Mile Creek crossing);
- Agricultural Pond (east of 407 ETR off-ramp, south of Neyagawa Boulevard);
- Agricultural Pond (east of 407 ETR, north of 6th Line);
- Vernal Pool (east of 407 ETR, south of Trafalgar Road); and,
- Tributary of East Sixteen Mile Creek (east of 407 ETR, south of 9th Line).

Herpetofauna occurrence records within the vicinity of the study area were obtained from the Ontario Reptile and Amphibian Atlas, CH and CVC. Data obtained from the Ontario Reptile and Amphibian Atlas and Conservation Halton confirmed records for the five species recorded during LGL's 2019 anuran surveys, as well as an additional five species. These include American Bullfrog (*Lithobates catesbeianus*); Northern Leopard Frog (*Lithobates pipiens*); Wood Frog (*Lithobates sylvaticus*); Red-backed Salamander (*Plethodon cinereus*); Brownsnake (*Storeria dekayi*); and, Snapping Turtle (*Chelydra serpentina*) (Ontario Nature, 2017). Data obtained from Credit Valley Conservation included records for three of the above-mentioned species (American Toad, Gray Treefrog and Green Frog).

Only a single reptile species was observed by LGL during field investigations in 2018 and 2019. Several Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) were observed along riparian areas associated with watercourses such as Bronte and Sixteen Mile Creek. Incidental observations of amphibian species such as Green Frog and American Toad were also made along these riparian areas.

Of the herpetofauna species observed by LGL, only one is a species at risk. The Western Chorus Frog, a species regulated under the federal *Species at Risk Act*, was identified at several anuran survey stations. Secondary source data contained records for two additional species at risk, Blanding's Turtle (*Emydoidea blandingii*) and Snapping Turtle (*Chelydra serpentina*), in the vicinity of the study area.

Mammals

A total of 13 mammal species were recorded by LGL during field investigations conducted in 2018 and 2019. The mammal assemblage identified is typically associated with forest, forest edge, meadow/open-country, aquatic and anthropogenic habitat types. Species identified, such as beaver (*Castor canadensis*), American mink (*Neovison vison*), northern raccoon (*Procyon lotor*) and muskrat (*Ondatra zibethica*) were typically identified in association with aquatic environments such as stormwater management ponds or watercourse crossing, while other species identified, such as white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), meadow vole (*Microtus pennsylvanicus*), northern short-tailed shrew (*Blarina brevicauda*) and coyote (*Canis latrans*) were generally identified in association with agricultural lands or forested habitats. Species such as striped skunk (*Mephitis mephitis*), eastern gray squirrel (*Sciurus carolinensis*) and red squirrel (*Tamiasciurus hudsonicus*) were most often associated with urbanized habitats or documented as road mortality. Generally, the mammal species documented within the study area represent an assemblage that readily utilizes human influenced landscapes.

No species at risk mammals were identified during field surveys. Species at risk data provided by the MNRF, Aurora District Office in a letter dated September 6, 2017 suggests that four species at risk bats have the potential to be found within the vicinity of the study area. These species include Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-coloured Bat (*Perimyotis subflavus*).

WILDLIFE SPECIES AT RISK

A review of secondary source data identified records for 19 wildlife species at risk located within the study area, and an additional seven wildlife species at risk with the potential to be found in the study area. These records are attributed to several data sources as described below. Several species at risk records compiled are considered historical (>20 years old) and/or were recorded near the study area, but records may not reflect the current condition of natural heritage features present within the lands examined. Of note, is that several species at risk were recorded from more than one secondary data source.

A review of the Natural Heritage Information Centre database (NHIC) (MNRF 2017) returned records for eight species at risk. These include Eastern Meadowlark (*Sturnella magna*), Bobolink (*Dolichonyx oryzivorus*), Barn Swallow (*Hirundo rustica*), Henslow's Sparrow (*Ammodramus henslowii*), Common Five-lined Skink (Southern Shield population) (*Plestiodon fasciatus* pop. 2), Milksnake *(Lampropeltis*

triangulum), Jefferson X Blue-spotted Salamander (Jefferson genome dominates) (*Ambystoma hybrid* pop. 1) and Timber Rattlesnake (*Crotalus horridus).* Many of these records are considered dated.

Species at risk data was also received from the MNRF, Aurora District Office in a letter dated September 6, 2017. Two of the species listed have been documented in the study area (Bank Swallow and Jefferson Salamander). An additional ten species are identified to have the potential to occur (including Barn Swallow, Eastern Meadowlark, Bobolink, Canada Warbler (*Cardellina canadensis*), Chimney Swift (*Chaetura pelagica*), Snapping Turtle, Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-coloured Bat).

Breeding Bird Atlas data collected in the vicinity of the study area revealed records of several species at risk birds (Cadman et al. 2006). However, as the Breeding Bird Atlas data extends beyond the limits of the study area (i.e., 10 x 10 km data squares), it is not possible to determine which species were identified within the actual limits of the study area. Fourteen bird species at risk were recorded based on records from the Breeding Bird Atlas, several of which were also recorded in the data sources described above.

Field investigation conducted in 2018 and 2019 confirmed the presence of five species at risk including Western Chorus Frog, Eastern Wood Pewee, Barn Swallow, Bobolink and Eastern Meadowlark. Species listed as Endangered or Threatened on the Species at Risk in Ontario (SARO) list are protected/regulated under the *Endangered Species Act*, 2007 (ESA 2007). Specifically, Section 9(1) of the ESA prohibits a person from 'killing, harming, harassing, capturing or taking' a member of a species listed as Endangered, Threatened or Extirpated on the SARO list. Section 10(1) of the ESA prohibits the damage or destruction of habitat of a species listed as Endangered or Threatened on the SARO list.

Each of the 28 species identified above, their respective legal status, biological requirements and habitat suitability within the study area are discussed below.

Western Chorus Frog

Element occurrence data provided by Ontario Reptile and Amphibian Atlas (Ontario Nature 2017) contained two records (both dated 1995) of Western Chorus Frog in the vicinity of the study area. The Western Chorus Frog (Great Lakes/St. Lawrence Population) is regulated as 'Threatened' under the SARA, but the species is not designated under the ESA. The Western Chorus Frog is generally associated with marshes, meadows, swales and other open habitats (Harding 1997). Decline in Chorus Frog numbers is largely attributed to habitat destruction and fragmentation. As noted above, this species is not regulated under the ESA, and lands within the study area are generally not federally owned, a criterion that would trigger a federal permit if the species was identified within the study area. Open habitats that have the potential to support Western Chorus Frog were identified across the project lands. Anuran call surveys conducted during 2019 surveys identified vocalizing male Western Chorus Frog at three stations (Stations #5, #6 and #9; **Figures 3.2a to 3.2f**). This species was identified breeding in small cattail marshes and a storm pond.

Jefferson Salamander

Review of the NHIC database contained three records (most recent 1989) of Jefferson Salamander and Jefferson X Blue-spotted Salamander, Jefferson genome dominates (hybrid population of Jefferson Salamander). MNRF confirmed that Jefferson Salamander has been recorded within the vicinity of the study area, although the record location is unknown. The Jefferson Salamander is regulated as 'Endangered' under the ESA and the SARA. The Jefferson X Blue-spotted Salamander, Jefferson genome dominates hybrid is also afforded protection under the ESA. The Jefferson Salamander (including hybrid populations) is generally associated with deciduous forest habitats. This species lives under leaf-litter and logs and is generally encountered when they move to vernal pools to breed in the early spring. Field investigations conducted in 2018 and 2019 identified one vernal pool located east of 407 ETR, south of Trafalgar Road. However, suitable general/dispersal habitat for Jefferson Salamander may include deciduous forest habitats that were identified at a number of sites across the study area.

Milksnake

Review of the NHIC database contained 12 records of Milksnake (most recent 1990) which were located at sites across the study area. Milksnake was formerly listed as 'Special Concern' under the ESA and SARA; however, this species has recently been removed from the SARO list and is not a regulated species (Endangered or Threatened) under the ESA. Milksnake is found in a wide variety of habitats. This species is known to inhabit areas heavily disturbed by humans (e.g., farmland, urban parks and residential areas). Habitats that could be suitable to support Milksnake were found across much of the study area. Field investigations conducted in 2018 and 2019 did not identify this species.

Timber Rattlesnake

Review of the NHIC database contained 15 records of Timber Rattlesnake (all dated 1950) which were located at sites across the study area. The Timber Rattlesnake is listed as 'Extirpated' under both the ESA and SARA. This species has been considered extirpated from Ontario for more than 50 years. Field investigations conducted in 2018 and 2019 did not identify this species.

Common Five-lined Skink (Southern Shield population)

Review of the NHIC database contained two records (both dated 1992) of Common Five-lined Skink (Southern Shield population). The Common Five-lined Skink (Southern Shield population) is regulated as 'Special Concern' under the ESA and SARA. The other poulation, Carolinian population, of this species is largely restricted to dunes, open woods or savannas with sandy substrates. No habitat considered suitable to support this species is expected within the study area. Field investigations conducted in 2018 and 2019 did not identify this species.

Snapping Turtle

MNRF confirmed that Snapping Turtle have been recorded within the vicinity of study area, although the record location is unknown. The Snapping Turtle is listed as 'Special Concern' under the ESA and the *Species At Risk Act* (SARA); however, this species is not a regulated species ('Endangered' or 'Threatened') under either act. Snapping Turtle is generally associated with aquatic settings such as lakes, ponds, bays and inlets. This is a highly aquatic species; however Snapping Turtles may leave the water to seek out new aquatic habitats or to lay eggs. The potential exists for Snapping Turtles (from surrounding aquatic communities) to use road shoulders present within the study area as nesting habitat and Snapping Turtles from surrounding areas may use habitats within the study area during overland movements from one aquatic area to another. Suitable habitat for Snapping Turtle may include storm water management facilities, ponds, watercourses and other aquatic habitats found across the study area. Field investigations conducted in 2018 and 2019 did not identify this species.

Common Nighthawk

Records for this species were present in Breeding Bird Atlas data (dated from 2001-2005). Common Nighthawk is listed as 'Special Concern' under the ESA and 'Threatened' under the SARA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. Common Nighthawk nest in rural and urban habitats such as logged forests, forest clearings, grasslands, open forests, and rocky outcrops. They may also nest on flat gravel rooftops. Open habitats that have the potential to support Common Nighthawk were identified across the project lands. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Chimney Swift

MNRF confirmed that Chimney Swift has the potential to be found within the vicinity of the study area. Chimney Swift is regulated as 'Threatened' under the ESA and SARA. The Chimney Swift nests in urban and rural areas, largely in chimneys but also in hollowed trees or caves, and forages mainly over open areas (over forests, ponds, and residential areas). Habitats which have the potential to support Chimney Swift were found where deciduous habitat communities were identified within the project lands. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Eastern Wood Pewee

Records for Eastern Wood Pewee were present in Breeding Bird Atlas data (dated from 2001-2005). Eastern Wood Pewee is listed as 'Special Concern' under the ESA and the SARA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. This species is found in deciduous and mixed forests and in forest openings/clearings/edges. Habitats which have the potential to support Eastern Wood Pewee were found where deciduous/mixed forest habitat communities and forest edges were identified within the project lands. This species was identified at several breeding bird stations (9-2019, 5-2019, 8-2019, 10-2019, 17-2019, 19-2019, 21-2019, 36-2019) during surveys conducted in 2019 (see **Figures 3.2a-3.2f**). Generally, observations of this species were associated with woodland edges.

Bank Swallow

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Bank Swallow. MNRF noted that Bank Swallow has been previously recorded in the vicinity of the study area, although the record location is unknown. Bank Swallow is regulated as 'Threatened' under the ESA. The Bank Swallow is listed as 'Special Concern' by COSEWIC, but has no status under the SARA. This species generally nests along rivers, streams, lake shorelines or reservoirs. Nests are excavated along vertical surfaces such as eroded stream banks, sand/gravel piles and road cuts. Nesting habitat for this species has the potential to be found in the study area, including along eroded riverbanks and potentially other vertical surfaces. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Barn Swallow

Breeding Bird Atlas data for areas within the vicinity of the study area also contained records (dated from 2001-2005) for Barn Swallow. MNRF confirmed that Barn Swallow has the potential to be found in the vicinity of study area. Barn Swallow is regulated as 'Threatened' under the ESA and the SARA. The Barn Swallow generally builds mud nests on bridges, walls, ledges and barns (Cadman et al. 2007). The Barn Swallow typically forages in open areas such as agricultural lands, meadows or over water. Habitat considered suitable to support foraging Barn Swallow was identified across much of the study area, with the exception of forested habitats. Nesting habitat for this species has the potential to be found in the study area, including bridges, buildings and other man-made structures. This species was identified at a number of breeding bird stations during surveys conducted in 2018 and 2019. However, most observations of this species were limited to foraging individuals, often over SWM ponds, agricultural fields or meadows. Confirmed breeding colonies were identified at several locations across the lands surveyed (see **Appendix E** of this EPR). However, each breeding colony identified was located outside of the transitway alignment and station alternatives. Breeding colonies identified were typically associated with barns or other outbuildings within agricultural settings. This species was documented during field investigations at stations 5-2018, 6-2018, 7-2018, 10-2018, 11-2018, 13-2018, 16-2018, 17-2018, 18-2018, 19-2018, 1- 2019, 2-2019, 8-2019, 14-2019, 15-2019, 23-2019, 25-2019, 30-2019, 30-2019, 31-2019, 33-2019, 34-2019, 35-2019, 40-2019 (**Figures 3.2a-3.2f** and **Appendix E** of this EPR).

Canada Warbler

MNRF confirmed that Canada Warbler has the potential to be found within the vicinity of study area. The Canada Warbler is listed as 'Special Concern' under the ESA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. The Canada Warbler is listed as 'Threatened' by COSEWIC and the SARA. The Canada Warbler breeds in a variety of deciduous and coniferous wooded habitats, particularly those that contain a dense understory of shrubs or other vegetation. Habitat considered suitable to support Canada Warbler was identified (through air-photo analysis) where wooded

areas exist; however, ground-truthing is required to confirm the suitability of potential habitat areas. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Golden-winged Warbler

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Golden-winged Warbler. The Golden-winged Warbler is listed as 'Special Concern' under the ESA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. The Golden-winged Warbler is regulated as 'Threatened' under the SARA. The Golden-winged Warbler nests in areas with young shrub growth surrounded by mature forest communities, locations that have experienced disturbance, such as field edges, hydro or utility corridors. Habitat that may be considered suitable to support Golden-winged Warbler was identified (through air-photo analysis) where open-county habitat borders forest communities; however, ground-truthing is required to confirm the suitability of potential habitat areas. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Grasshopper Sparrow

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Grasshopper Sparrow. The Grasshopper Sparrow is listed as 'Special Concern' under the ESA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. The Grasshopper Sparrow is listed as 'Special Concern' under the SARA. The Grasshopper Sparrow nests in open grassland, hayfields and pastureland. Habitat that may be considered suitable to support Grasshopper Sparrow was identified (through air-photo analysis) where open-county habitat exists; however, ground-truthing is required to confirm the suitability of potential habitat areas. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Peregrine Falcon

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Peregrine Falcon. The Peregrine is listed as 'Special Concern' under the ESA and SARA; however, this species is not a regulated species under either act. Historically, the Peregrine Falcon nested almost exclusively on rocky ledges near waterbodies; however, this species now nests on tall building ledges in large cities. Habitat that may be considered suitable to support Peregrine Falcon was identified (through air-photo analysis) where tall building ledges are found; however, ground-truthing is required to confirm the suitability of potential habitat areas. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Red-headed Woodpecker

Red-headed Woodpecker is listed as 'Special Concern' under the SARO List; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. This species is regulated as 'Threatened' under the SARA. The Red-headed Woodpecker lives in open woodland and woodland edges, and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, which the bird uses for nesting and perching. Habitats which could be suitable to support the Red-headed Woodpecker were generally absent from the study area; however, ground-truthing is required to confirm the suitability of potential habitat areas. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Least Bittern

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Least Bittern. The Least Bittern is regulated as 'Threatened' under the ESA and the SARA. Least Bittern are typically found in wetland communities, particularly large contiguous tracts of coastal wetland habitat. No habitat considered suitable to support this species was identified within the study area. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Louisiana Waterthrush

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Louisiana Waterthrush. The Louisiana Waterthrush is regulated as 'Threatened' under the ESA and the SARA. This species is typically associated with steep, forested ravines with fast-flowing streams. Habitat suitable to support this species may be found where watercourse valleylands are present within the study area. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Eastern Whip-poor-will

Breeding Bird Atlas data for areas within the vicinity of the study area contained records (dated from 2001-2005) for Eastern Whip-poor-will. The Eastern Whip-poor-will is regulated as 'Threatened' under the ESA and the SARA. This species is typically associated with a mix of open and forested areas, such as savannahs, open woodlands or openings in deciduous, coniferous and mixed forests. Habitat suitable to support this species may be found where forested communities are present within the study area. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Henslow's Sparrow

Review of the NHIC database contained four records of Henslow's Sparrow (dated 1932 and 2000) which were located at a number of sites within the vicinity of the study area. The Henslow's Sparrow is regulated as 'Endangered' under the ESA and the SARA. MNRF data included record(s) for this species within the vicinity (5 km) of the study area. Henslow's Sparrow is typically found in large and undisturbed grassland communities. No habitat considered suitable to support this species was identified within the study area. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Wood Thrush

Breeding Bird Atlas data for areas within the vicinity of the study area also contained records (dated between 2001-2005) for Wood Thrush. Wood Thrush is listed as 'Special Concern' under the ESA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. The Wood Thrush is listed as 'Threatened' under the SARA. The Wood Thrush is found in mature deciduous and mixed forests with large trees, shade and leaf litter for foraging. Habitats which have the potential to support Wood Thrush were found where mature deciduous and mixed forest habitat communities were identified within the project lands. Breeding bird surveys conducted in 2018 and 2019 did not identify this species.

Bobolink

Review of the NHIC database contained three records (most recent 2005) of Bobolink. Breeding Bird Atlas data for areas in the vicinity of the study area also contained records (dated between 2001-2005) for Bobolink. MNRF confirmed that Bobolink has the potential to be found in the vicinity of study area. The Bobolink, a species with a broad distribution across southern Ontario, is regulated 'Threatened' under the ESA and the SARA. Bobolinks are typically described as residents of grassland communities with an abundance of grass species that are typical of old fields (Cadman et al. 2007). Bobolinks are also commonly associated with agricultural lands. Open-country, meadow and agricultural habitat types found across the study area have the potential to provide habitat suitable to support this species. This species was documented during field investigations at stations 5-2018 and 34-2019.

Eastern Meadowlark

Review of the NHIC database contained five records (most recent 2009) of Eastern Meadowlark. Breeding Bird Atlas data for areas in the vicinity of the study area also contained records (dated between 2001-2005) for Eastern Meadowlark. MNRF confirmed that Eastern Meadowlark has the potential to be found in the vicinity of study area. The Eastern Meadowlark, a species with a broad distribution across southern Ontario, is regulated 'Threatened' under the ESA and the SARA. The Eastern Meadowlark, formerly a prairie species, has adapted to agricultural practices of the European settlers (hayfields, pastures, etc.) (Cadman et al. 2007). As farming practices have become more efficient, Eastern Meadowlark numbers have declined. Open-country, meadow and agricultural habitat types found across the study area have the potential to provide habitat suitable to support this species. This species was documented during field investigations at stations 5-2018, 7-2019, and 33-2019.

Bats

There are currently four bat species regulated as 'Endangered' under the ESA, including Eastern Small-footed Myotis; Little Brown Myotis; Northern Myotis; and, Tri-coloured Bat. The ESA affords protection for both individuals of these species (subsection 9(1)) and their habitat (subsection 10(1)). Given that species-specific habitat regulations have not yet been developed for SAR bats, habitat is protected according to the general definition provided in the ESA. Specifically, according to section 2(1), the Act protects "an area, on which the species depends, directly or indirectly, to carry on its life processes, including processes such as reproduction, rearing, hibernation, migration or feeding".

The distribution of the four bat species overlaps the study area (BCI 2019). The habitat that is important for the survival and recovery of the species are the swarming and hibernation sites, and maternity roosting locations (ECCC 2018, Humphrey 2019, Humphrey 2017). The potential for these habitats was assessed following A Framework for Assessment and Monitoring of Bat Habitat (Morningstar 2018).

Swarming and hibernation sites are underground features such as caves, mines or underground tunnels. The Karst of Ontario (Brunton 2008) describes known karst areas where there is potential for caves, crevices and other degraded limestone which could provide hibernation habitat for bats. Based on this resource, there is no known karst within the study area. A Tri-coloured Bat was known to hibernate in the underground tunnel of the Roseland Creek, approximately 2.5 km south of the study area, and bats are known to hibernate at the caves of Mount Nemo Conservation Area, approximately 3 km west of the study area. Bats will also commonly use inactive tunnel mines, caves and constructed tunnels.

The Abandoned Mines Information Database (AMIS) provides known locations of historic mining features, none of which have been identified within the study area. Underground tunnels are not mapped on a publicly available database. These occur frequently in urban areas where there is underground infrastructure (i.e. sewers, storm water management, etc) and can occur within the study area. To be suitable for bat hibernation, the underground feature must have undisturbed dark zones and stable winter climate with temperatures that remain above freezing. Five potential underground tunnels were identified from review of the aerial imagery available for the proposed runningway and stations. Site investigation was completed of the external conditions of these tunnels on August 8, 2019 to determine if they are suitable as potential bat hibernacula.

Maternity roosting habitat has been grouped into three types: treed habitat, buildings, and rock piles. The potential for trees to provide bat maternity roosting habitat changes over time, with more mature trees and treed habitats likely providing better quality habitat. Little Brown Myotis and Northern Myotis will use cavities in the trees or exfoliating bark, while Tri-coloured Bat roosts in clumps of leaves in the foliage. Within the study area, many treed habitats occur, and all of these are considered potentially suitable as bat roosting habitat. Buildings are also used for roosting, most frequently by Little Brown Myotis. Bats could use any building, regardless of building age, structure type or whether it is currently occupied by people. Therefore, all buildings are considered potentially suitable habitat. Eastern Small-footed Myotis is a saxicolous (rock-loving) species and will frequently roost in rock piles, talus, or crack and crevices in rock outcrops.

3.1.8. Designated Natural Areas

Designated natural areas include areas identified for protection by the Ontario Ministry of Natural Resources and Forestry, (MNRF) Credit Valley Conservation (CVC), Conservation Halton (CH) and upper tier and lower tier municipalities.

PROVINCIALLY SIGNIFICANT WETLANDS

Three Provincially Significant Wetland (PSW) complexes are located within 120 m of the study area, including the North Oakville-Milton East PSW, the North Oakville-Milton West PSW and the Churchville-Norval PSW Complex. The locations of the PSW complexes are presented in **Figure 3.2A to 3.2F.**

The North Oakville-Milton West Wetland Complex is located within the Oakville-Milton Wetlands and Uplands, Candidate ANSI. The North Oakville Milton East Wetland Complex is located within the Oakville–Milton Wetlands and Uplands Candidate ANSI.

North Oakville-Milton East PSW

The North Oakville-Milton East PSW is located within the headwaters of Sixteen Mile Creek and Joshua Creek. The wetland complex is comprised of 104 wetlands, which covers a total of 35 hectares. This wetland complex supports 45 significant species including 41 locally rare plant species, four regionally rare plant species and the locally rare Northern Ribbon snake (Ministry of Natural Resources 2006a).

North Oakville-Milton West PSW

The North Oakville-Milton West PSW is located within the headwaters of Sixteen Mile Creek, Fourteen Mile Creek, and Taplow Creek. The complex is comprised of 147 wetlands covering a total of 20 hectares. This wetland complex supports 42 significant species including one provincially rare plant species, four regionally rare plant species and 36 locally rare plant species (Ministry of Natural Resources 2006b).

Churchville-Norval PSW

The Churchville-Norval PSW complex is located between Financial Drive and Mavis Road. This complex covers an area of 15.57 ha and consists of 48 evaluated communities most of which are associated with riparian areas of the Credit River. Of these communities, there are 26 marshes, 3 open water and 19 swamps varying in size from 0.017 ha to 3.02 ha.

UNEVALUATED WETLANDS

Drumquin Unevaluated Wetland

One unevaluated wetland, the Drumquin Wetland is located over 120 m west of the study area. The Drumquin Wetland has not been evaluated and is not identified as provincially significant. This wetland is located on the north and south sides of Britannia Road, and west of 407 ETR. The major part of the forest is a swamp dominated by large silver maple, some of which have attained girths of 110-120 cm DBH. The swamp is an uncommon vegetation type within the Peel Plain physiographic region. In areas of better drainage, such as along the wooded section of the terrace adjacent to the small tributary to Sixteen Mile Creek, upland species such as red oak, American beech, white ash, black cherry and hop hornbeam occur (Halton Region and North-South Environmental Inc. 2005).

AREAS OF NATURAL AND SCIENTIFIC INTEREST

There are three Areas of Natural and Scientific Interest (ANSI) identified within the study area, the Nelson Slope Forest Life Science ANSI, Zimmerman Valley Life Science ANSI, and the Trafalgar Moraine Earth Science ANSI. In addition, two candidate ANSIs, Sixteen Mile Creek Candidate Life Science and Oakville-Milton Wetlands and Uplands Candidate Life Science ANSI are found within the study area. A description of each ANSI is provided below, and the locations are presented on **Figures 3.2A to 3.2F.**

Nelson Slope Forest Life Science ANSI

The Nelson Slope Forest Life Science ANSI is located within the eastern portion of the Nelson Escarpment Woods. The Nelson Escarpments Woods is located on the north side of The 407 ETR between Walkers Line and Cedar Springs Road and is approximately 221 ha in size. The Nelson Escarpment Woods span a series of valleys and ridges along the edge of the Niagara Escarpment. The dominant forest cover is sugar maple and American beech with several small ponds in the eastern portion.

A small portion of the Nelson Slope Forest Area of Natural and Scientific Interest (ANSI) Life Science (regionally significant) is located west of Walkers Line and the 407 ETR and is over 250 m north of the study area. This feature is located within the Niagara Escarpment Plan area.

Zimmerman Valley Life Science ANSI

The Zimmerman Valley Life Science ANSI encompasses the Bronte Creek valley and was designated as a regionally significant life science ANSI because it is a good representation of the Ontario-Peel plain valley. The ANSI contains a large meander valley with representative patterns, and contains local geomorphological and floristic significance (Natural Heritage Information Centre 2011). Valley rim/bluff prairie vegetation is reported from the Zimmerman Valley ANSI (Ministry of Natural Resources 2006c)and is located on an open bluff and eroding valley rim dominated by big bluestem (Andropogon gerardii) (Natural Heritage Information Centre 2011).

Trafalgar Moraine Earth Science ANSI

The Trafalgar Moraine Earth Science ANSI is comprised of three distinct morphologies including fluted till with the moraine crest preserved, a ridged smooth till moraine and a ridged, slightly hummock till moraine east of Sixteen Mile Creek (Halton Region and North-South Environmental Inc. 2005). The Trafalgar Moraine encompasses the upper reaches of Sixteen Mile Creek, Glenrochy Conservation Area and a portion of the Oakville-Milton East and West Wetland Complexes. Existing land uses have not significantly impacted the landforms identified in the ANSI, but the Trafalgar Moraine would be highly sensitive to any activities that alter the natural contours of the identified features through grading and/or covering of the landforms (Ministry of Natural Resources 2006c).

Oakville-Milton Wetlands and Uplands Life Science Candidate ANSI

The Oakville-Milton Wetlands and Uplands Life Science Candidate ANSI is approximately 290 ha in size and is comprised of 11 woodlots (Ministry of Natural Resources 2006d). The ANSI supports a diversity of 115 vegetation communities including a number of wetland communities that are rare in site district 7EA (Natural Heritage Information Centre 2011). In particular, the ANSI supports three provincially rare wetland types: buttonbush thicket, bur oak and swamp white oak swamp. The ANSI supports a high concentration of 59 significant plant species and 46 significant faunal species. The Oakville-Milton Uplands ANSI is part of a larger matrix of forest communities within northern Oakville that includes the Sixteen Mile Creek Valley Candidate ANSI.

Sixteen Mile Creek Valley Life Science Candidate ANSI

The Sixteen Mile Creek Valley Life Science Candidate ANSI supports a high concentration of plant species including 105 significant plant species (Natural Heritage Information Centre 2011). This ANSI supports a number of vegetation community types that are provincially and regionally rare including provincially rare tall-grass prairie bluffs, three provincially rare wetland community types and seven wetland types that are locally rare (Natural Heritage Information Centre 2011).

GREENBELT PLAN

Lands on the north side of the 407 ETR between 6th Line and Dundas Street, and a small area of lands on the south side of the 407 ETR are primarily within the Greenbelt Plan area, under the 'Protected Countryside' and 'Urban River Valley' designations. Apart from the lands associated with Bronte Creek, most of the Greenbelt Plan 'Protected Countryside' is located on the north side of the 407 ETR.

A number of watercourses are designated as 'Urban River Valley' within the study area. The 'Urban River Valleys' includes Fourteen Mile Creek, west of Bronte Road, the Glenorchy Conservation Area and Sixteen Mile Creek, east of Bronte Road. Bronte Creek is not identified as 'Urban River Valley' as it is already included in the Greenbelt Natural Heritage System.

The Zimmerman Valley Life Science ANSI and Bronte Creek Valley are located within the valleylands of Bronte Creek, east of Appleby Line. This ANSI is identified within the Greenbelt Plan area under the 'Protected Countryside' designation.

NIAGARA ESCARPMENT PLAN

A portion of the study area on the north side of the 407 ETR between Dundas Street and Walkers Line is found within the Niagara Escarpment Plan area. The lands are primarily designated 'Escarpment Protection Area', 'Escarpment Natural Area' and a small section is designated 'Escarpment Rural Area.'

NATURAL HERITAGE SYSTEM

City of Burlington

According to the City of Burlington's Official Plan (2017), the lands located immediately north of the 407 ETR are designated 'Agricultural Rural Area' and lie adjacent to the 'Niagara Escapement Plan Area'. Bronte Creek and its associated habitat are classified as 'Greenlands (Non-Escarpment Plan Area)' and 'Environmentally Sensitive Area'.

The Halton Region Official Plan (2018) identifies lands and most watercourses and their associated habitats under 'Prime Agricultural Areas in NHS Enhancement/Linages/Buffers', 'Key Features', and 'Greenbelt Natural Heritage System' (Appendix A: Map 1G). The Regional Structure of Halton Region identifies the lands northeast of Trafalgar Road within the 'Agricultural Area', while the remaining lands north of the 407 ETR are identified within the 'Regional Natural Heritage System,' 'Greenbelt Natural Heritage System', and the 'Greenbelt Plan Protected Countryside Boundary'.

Watercourses through the corridor include Rambo Creek, Roseland Creek, Tuck Creek, Tributary of Shoreacres Creek, Appleby Creek, Tributary of Sheldon Creek, Bronte Creek, and Tributary of Fourteen Mile Creek.

To view all schedules and maps refer to **Appendix E** of this EPR.

Town of Oakville

Within the Town of Oakville, the Livable Oakville Plan applies to lands south of the Dundas Street and north of the 407 ETR. The North Oakville East and West Secondary Plans apply to lands north of Dundas Street and south of the 407 ETR. There are several natural heritage features located within the Town of Oakville. The natural heritage features and the majority of the watercourses found within the study area are classified 'Area of Natural and Scientific Interest', 'Woodlands', 'Wetlands', and 'Floodplain' as part of the City's Natural Features and Hazard Lands in the Livable Oakville Plan.

The natural features and watercourse that exist within the North East Oakville Secondary Plan area are all identified under the 'Natural Heritage System Area' designation. The watercourses that flow through this corridor include Fourteen Mile Creek, Sixteen Mile Creek, and East Sixteen Mile Creek. The majority of the watercourses and their associated habitat found within the study area are designated as 'Linkage Preserve Area' 'Optional Linkage Preserve Area', with tributaries designated as 'High Constraint Stream Corridors', 'Medium Constraint Stream Corridors', 'Low Constraint Stream Corridors', 'Hydrological Features A' and 'Hydrological Features B', in North East Oakville Secondary Plan area.

There are a number of designated natural areas located within the Town of Oakville, including Trafalgar Moraine ANSI, Earth Science (provincially significant), Oakville-Milton Wetlands and Uplands Candidate ANSI, Life Science (provincially significant), Sixteen Mile Creek Candidate ANSI, Life Science (provincially significant), North Oakville-Milton East Provincially Significant Wetland (PSW), and North Oakville-Milton West Provincially Significant Wetland (PSW).

In addition, all of the lands situated on the north side of the 407 ETR are part of the Greenbelt Plan 'Protected Countryside'. On the south side of the 407 ETR, Fourteen Mile Creek, Glenorchy Conservation Area, and Sixteen Mile Creek are designated as 'Urban River Valleys' in the Greenbelt Plan. To view all schedules and maps refer to **Appendix E** of this EPR.

Town of Milton

The natural heritage features are generally limited to blocks or small pockets of forest, meadow, thicket, swamp, and marsh. The Tributaries of East Sixteen Mile Creek are identified under the 'Greenlands A Area' and 'Environmentally Sensitive Area' land use designation in Town of Milton Official Plan (Schedule A). Designated natural areas found within the Town of Milton include the Drumquin Non-Provincially Significant Wetland, located north and south of Britannia Road. Portions of a number of the designated natural areas (i.e. PSWs) described for the Town of Oakville also are located in the Town of Milton.

Town of Halton Hills

Within the Town of Halton Hills, natural heritage features are generally characterized as meadow, marsh and swamp habitats. Tributaries of East Sixteen Mile Creek are located through this area and are identified under the 'Greenlands' land use designation.

City of Mississauga

The Ninth Line Lands are predominantly rural in nature, with agricultural fields, meadows and areas of forest. The Tributary of East Sixteen Mile Creek is located within these lands. There are a number of large woodlots and natural areas within the Ninth Line Neighbourhood.

In the City of Mississauga Official Plan (2019) the majority of watercourses and their associated habitat within the study area are designated 'Greenlands', 'Natural Hazard Area', and 'Public Open Space'. In addition, within the City's Natural System, areas of 'Significant Natural Areas and Natural Green Spaces' and 'Special Management Areas' are identified typically associated with the watercourses. These areas include the Tributary of East Sixteen Mile Creek, the Credit River, and the Tributary of Fletchers Creek. Although the Churchville-Norval Wetland lies within the City of Brampton, it is associated with the Credit River watershed and recognized within the City of Mississauga's Natural System. **Appendix E** presents the locations of these areas/features.

City of Brampton

The 407 ETR travels adjacent to natural heritage features in several areas. According to the City of Brampton Official Plan (2015), the majority of the watercourses and their associated habitat found within the study area are classified as 'Open Space' and as 'Valleyland/Watercourse Corridor' as part of the City's Natural Heritage System. In addition, areas of 'Woodland' and 'Provincially Significant Wetland' are identified in the study area, typically associated with the valleylands of study area watercourses. Appendix A: Schedule A and D presents the locations of these areas/features. Under the Region of Peel Official Plan (2018), several areas within the City of Brampton are located within the 'Core Areas of the Greenlands System in Peel'. These areas include lands associated with Fletchers Creek, Credit River, Levis Creek, and the Tributary of Mullet Creek.

The Region of Peel's current 'Greenbelt Plan Area' is located well north of the study area, although there are two 'River Valley Connections Outside the Greenbelt' that cross through the study area in association with the Credit River. The 'River Valley Connections Outside the Greenbelt' is also identified as 'Selected Areas of Provincial Interest' in the Region of Peel's Official Plan, the Greenbelt Plan was updated by the Ministry of Municipal Affairs in May 2017 and designates the Credit River under 'Urban River Valleys'. The City of Brampton and Region of Peel's Official Plans have not yet been updated to address these changes to the Greenbelt Plan.

3.1.9. Air Quality

Environment Canada and Ministry of the Environment, Conservation and Parks (MECP) measure air contaminants at various locations throughout Ontario, and report on the state of Ontario's air quality on an annual basis. At the time of the existing conditions assessment, there were four continuous air monitoring stations located in the general vicinity of the study area. **Table 3.5** outlines the monitoring stations considered for the study of Existing Conditions for the Project (**Appendix J**). The stations are considered representative of ambient air within the study area due to their proximity and similar urban intensity.

For each contaminant, the selected background concentrations are based on a 5-year average of the measured concentrations, except for Acrolein, Acetaldehyde and Formaldehyde which were based on the available 2-year period of data. It should be noted that historical monitoring data for PM10, TSP and GHG's are not available at any of these seven monitoring stations. However, PM10 and TSP background data were calculated using PM2.5 monitoring data and approved correlation factors of 0.5 and 0.3, respectively.

TABLE 3.5: MONITORING STATION LOCATIONS

CITY	STATION ID	LOCATION	OPERATOR	CONTAMINANTS	YEAR USED
Toronto West	35125	125 Resources Rd.	MECP	NO_2, $PM_{2.5}$, CO, SO_2	2012-2016
Mississauga	46108	3359 Mississauga Rd. N., U of T Campus	MECP	NO_2, $PM_{2.5}$, SO_2	2012-2016
Oakville	44017	Eighth Line/Glenashton Dr., Halton Res.	MECP	NO_2, $PM_{2.5}$	2012-2016
Toronto	60413	Elmcrest Road (Centennial Park), Toronto	ECCC	Benzene and 1,3-Butadiene	2011-2015
Brampton	60428	525 Main St. N. Brampton	ECCC	Benzene and 1,3-Butadiene	2011-2015
Toronto	60439	Roadside - Wallberg	ECCC	Formaldehyde, Acetaldehyde, Acrolein	2014-2015
Toronto Downtown	60427	Gage Institute	ECCC	benzo[a]pyrene	2010-2014

Table 3.6 summarizes the background data used, i.e. the 90th percentile concentrations of contaminants considered in this assessment. The ambient concentrations of benzene (annual average) and benzo[a]pyrene currently exceed their respective AAQCs.

TABLE 3.6: SUMMARY OF BACKGROUND AMBIENT AIR DATA

CONTAMINANT	AVERAGING PERIOD	ADOPTED BACKGROUND VALUE (µG/ m³)	AAQC /CAAQS (µG/m³)	STATION ID
NO_2	1 hr - 90th percentile	37.2	83 [a]	46108, 44017
	24 hr - 90th percentile	30.7	200	
	Annual Mean	17.4	24[b]	
$PM_{2.5}$[d,e]	24 hr - 90th percentile	13.9	27[c]	46108, 44017
	Annual Mean	7.8	8.8[d]	
SO_2	1 hr - 90th percentile	6.3	(100[e]) / 179[f]	46108
	24 hr - 90th percentile	5.25	275	
	Annual Mean	3.15	10[g]	
CO	1 hr - 90th percentile	419	36,200	35125
	8 hr - 90th percentile	403	15,700	
Acetaldehyde	24 hr - 90th percentile	1.76	500	60439
Acrolein	1 hr	0.07[h]	4.5	60439
	24 hr - 90th percentile	0.07	0.4	
Formaldehyde	24 hr - 90th percentile	3.3	65	60439
1,3 Butadiene	24 hr - 90th percentile	0.08	10	60413, 60428
	Annual Mean	0.05	2	
Benzene	24 hr - 90th percentile	0.82	2.3	60413, 60428
	Annual Mean	0.53[i]	0.45	
Benzo[a]pyrene	24 hr - 90th percentile	1.20E-04	5.00E-05	60427
	Annual Mean	7.80E-05	1.00E-05	

Notes:

a] The 2025 CAAQS is based on the 3-year average of the annual 98th percentile of the NO2 daily maximum 1-hour average concentrations (CCME 2017).
[b] The 2025 CAAQS is based on the arithmetic average over a single calendar year of all 1-hour average NO2 concentrations (CCME 2017).
[c] The 2020 CAAQS for 24-hour PM2.5 is based on the 98th percentile of 24-hour average concentrations, averaged over 3 consecutive years (CCME 2012).
[d] The 2020 CAAQS for annual PM2.5 is based on the 3 consecutive years average of the average annual concentrations (CCME 2012).
[e] The 2023 Ontario AAQC is based on 1-hour average SO2 concentrations (MECP 2018). Will take effect on July 1, 2023.
[f] The 2025 CAAQS is based on the 3-year average of the 99th percentile of the SO2 daily maximum 1-hour average concentrations (CCME 2016).
[g] The 2025 CAAQS is based on the arithmetic average over a single calendar year of all 1-hour average SO2 concentrations (CCME 2016).
[h] Acrolein 1-hour background concentration calculated from 24-hour Acrolein background concentrations using the averaging period conversion factor equation specified in Ontario's *Air Dispersion Modelling Guidelines* (MOECC 2016b). Monitoring data for this contaminant are not available for the 1-hour averaging period.
[i] Values in red represent background concentrations that exceed their respective AAQC.
[j] Statistics are calculated based on data downloaded from the MECP's Air Quality Ontario website, http://www.airqualityontario.com.
[k] TSP is not monitored in Ontario; therefore, background concentrations were calculated based on the correlation PM2.5/TSP = 0.3.
[l] PM10 is not monitored in Ontario; therefore, PM10 data were calculated from PM2.5 data using a correlation PM2.5/PM10 = 0.5.

The potential air quality impacts associated with the Project were assessed by predicting air contaminant concentrations under three scenarios: Existing Conditions (2018), Future No-Build (without the 407 Transitway in 2041), and Future Build (with the 407 Transitway in 2041). Descriptions and assumptions used in each of the assessment scenarios are detailed in the following sections.

Existing Conditions (2018)

The 407 Transitway will be constructed in the major traffic corridor of the existing 407 ETR from west of Brant Street, at the boundary of the Cities of Brampton and Mississauga, to west of Hurontario Street in the City of Mississauga. In particular, the Transitway will be built parallel to and typically within 50 m of 407 ETR for most of the route. Using the emissions estimating methods, an emissions inventory for Existing Conditions (2018) was developed for 407 ETR between Brant Street and Hurontario Street, including its arterial roads and interchanges: Hurontario Street, Mavis Road, Mississauga Road, Derry Road, Britannia Road, Trafalgar Road, Bronte Road, Appleby Line, Eglinton Avenue West, Walkers Line, Highway 403 and Highway 401.

Future No-Build (2041)

The expected year that the 407 Transitway will be in full operation is 2041. The Future No-Build (2041) scenario assumes that traffic volumes on 407 ETR will increase with population growth in the area. Projected traffic volumes were calculated based on annual growth rates. No changes to existing transportation infrastructure are assumed. However, improvements in vehicular combustion standards are expected. Therefore, an emissions inventory was developed using the methods outlined in **Appendix I** (Air Quality Impact Assessment Report) of this EPR.

Future Build (2041)

The Future Build (2041) scenario is the same as the above future scenario except for the addition of the 407 Transitway that will be fully grade-separated and approximately parallel to 407 ETR between Brant Street and Hurontario Street. The preferred alignment consists of a two-lane roadway (one lane in each direction) occupied solely by buses. In this scenario, buses are restricted to the 407 Transitway. It was assumed that the future bus fleet on the 407 Transitway would be diesel fueled as a worst-case scenario.

This scenario also considered eight potential 407 Transitway bus station locations where buses will briefly idle to allow passengers to board/depart buses. The proposed undertaking currently includes a bus storage yard that is located near Bronte Road. The bus storage yard is included in the model and is treated the same way as modelled stations. Specifically, buses entering/exiting the yard were modeleed assuming a peak AM/PM count of 8 buses per hour. Idling emissions of buses in the bus storage yard were not included in the modelling as these are expected to be insignificant since idling time would be limited. Parts of the alignment with planned tunnels were treated as regular roads. During the Detail Design phase, the final design of the tunnels, including ventilation shafts will be defined, and tunnel emissions will be re-modelled to confirm emissions.

Idling 407 Transitway bus emissions were not considered in this assessment. All stations will operate as regular bus street stops with passing lanes for express service; consequently, bus dling is not anticipated. Buses will only drop-off and pick-up passengers. In addition, during peak hours there will be approximately one bus per two minutes travelling through each of the stations; therefore, buses will stop

for very short periods to allow passengers to board and exit. Therefore, the emissions from bus idling are expected to be insignificant.

Neither the 407 Transitway nor 407 ETR have signaled road intersections, therefore, idling emissions from these alignments are not expected and were not considered in this assessment. Passenger vehicle emissions from within station parking lots and passenger pick-up and drop-Off (PPUDO) areas were assessed.

3.2. Socio-Economic and Cultural Environment

3.2.1. Land Use Planning Policies

The 407 Transitway is an integral element of the Growth Plan, which has been developed to support social, economic and environmental objectives for this area. Therefore, there is a need to view the project in a broader context than the traditional transportation demand/capacity relationship. It is recommended to assess the economic benefit in terms of its job creation potential, its role in supporting development adjacent to the corridor, and its support for the competitiveness of the entire region. Many lands in the Mississauga West-Brampton South area will be subject to Provincially Significant Employment Zone (PSEZ) policies in and around the highway which places certain land use expectations in these areas.

Figure 3.3 presents the regional land use within the study area, **Figure 3.4** presents the provincial land use within the study area, and **Figure 3.5 a-f** presents the lower tier municipal land use within the study area.

Provincial Policy Statement

The Provincial Policy Statement (PPS) (Ministry of Municipal Affairs and Housing, 2020) is issued under Section 3 of the *Planning Act* and provides policy direction on matters of provincial interest related to land use planning and development. The PPS (2020) replaces the previous PPS issued on April 30, 2014. The policy statement includes a range of policies related to three main themes: building strong communities; wise use and management of resources; and, protecting public health and safety. One of the visions in the PPS is the development of land use patterns that promote a mix of housing, employment, parks and open spaces, and transportation choices that facilitate pedestrian mobility and other modes of travel as well as connectivity among transportation modes. Land use patterns, density and mix of uses should minimize the distance and number of vehicle trips and support choices for public transit and other alternative transportation modes. Additionally, efficient use should be made of existing and planned infrastructure.

The PPS states that transportation and land use considerations must be integrated at all stages of the planning process. It provides for the planning and protection of corridors and rights-of-way for transportation, transit and infrastructure facilities to meet the current and projected areas. The PPS, requires the planning of major infrastructure to support long term economic prosperity by providing for an efficient, cost effective, reliable multi-modal transportation system that is integrated with adjacent systems and those other jurisdictions and is appropriate to address expected growth. In addition, it requires that planning for transportation and infrastructure corridors must consider significant resources such as natural heritage, agriculture, and cultural heritage resources. The PPS also promotes the coordination between municipalities and other levels of government for planning transit and infrastructure.

The 407 Transitway includes connections with other regional and local transit systems such as GO Transit, Burlington Transit, Oakville Transit, Milton Transit, MiWay and Brampton Transit. It will directly serve regional urban growth centres at the west end of study area. There are a number of urban growth centres within the municipalities along the length of the Transitway, including Downtown Burlington, Midtown Oakville, Downtown Milton, Downtown Mississauga, and Downtown Brampton.

A Place to Grow: Growth Plan for the Greater Golden Horseshoe

A Place to Grow Growth Plan for the Greater Golden Horseshoe (Growth Plan) (Ministry of Municipal Affairs, 2019) provides a framework for implementing the Provincial vision for building stronger, prosperous communities by better managing growth in the region by 2041. The intent of the Growth Plan is to reduce urban sprawl and consumption of land while making more efficient use of existing infrastructure. The Growth Plan was originally approved in 2006 and amended in 2013 and 2017 by the Ministry of Municipal Affairs. The plan has been replaced with the 2019 Plan that took effect on May 16, 2019.

The Growth Plan states that public transit will be the first priority for transportation infrastructure planning and major transportation investment. It promotes transit-supportive densities and a healthy mix of residential and employment land uses. The Growth Plan encourages the protection and efficient use of 'Employment Areas', emphasizing the protection of 'Employment Areas' adjacent to or near major goods movement facilities and major corridors, including major highway interchanges. The Growth Plan supports a transportation network that links urban growth areas through an extensive multi-modal system anchored by efficient public transit together with highway systems.

The 2019 Growth Plan includes a streamlined approach that enables the determination of major transit stations areas to happen at a faster rate to accommodate development. A new policy allows municipalities to delineate and set density targets for major transit station areas in advance of the municipal comprehensive review, provided the protected major transit station area tool under the *Planning Act* is used.

The Growth Plan identifies several regional urban growth centres including Downtown Burlington at the west end of the study area, and other centres that are connected to the 407 Transitway via local transit including Downtown Burlington, Midtown Oakville, Downtown Milton, Downtown Mississauga and Downtown Brampton.

The Greenbelt Plan

The Greenbelt Plan was established under Section 3 of the *Greenbelt Act*, 2005, and took effect on December 16, 2004. The Greenbelt Plan was updated, and a revised plan was released by the Ministry of Municipal Affairs in 2017. The Greenbelt Plan area is comprised of a number of plan areas, including: the Niagara Escarpment Plan area, Oak Ridges Moraine Conservation Plan area, Parkway Belt West Plan area, and the Greenbelt Plan 'Protected Countryside' and 'Urban River Valley'.

The study area contains lands within the Greenbelt Plan 'Protected Countryside', 'Natural Heritage System', and 'Urban River Valley', as well as the Niagara Escarpment Plan 'Escarpment Protection Area', 'Escarpment Natural Area' and 'Niagara Escarpment Parks and Open Space System'. The limits of these land use designations are presented in **Figure 3.4.**

Most of the Greenbelt Plan Protected Countryside is located on the north side of Highway 407, with the exception of lands at Bronte Creek. The following policies apply with respect to new infrastructure crossing the Greenbelt Plan Protected Countryside/Natural Heritage System. These policies will be considered throughout this study and incorporated into the evaluation of the alternatives. The Greenbelt Plan states in Section 4.2.1.1 (General Infrastructure Policies) that existing, expanded or new infrastructure subject to and approved under the *Canadian Environmental Assessment Act* or the Ontario *Environmental Assessment Act* is permitted within the Protected Countryside, subject to the policies of this section and provided it meets one of these two objectives:

- It supports agriculture, recreation and tourism, Towns/Villages and Hamlets, resource use or the rural economic activity that exists and is permitted within the Greenbelt; or
- It serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban centres and between these centres and Ontario's borders.

Section 4.2.1.2 of the Greenbelt Plan also states that the location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside are subject to the following:

(a) Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System and Water Resource System, traversed and/or occupied by such infrastructure;

(b) Planning, design and construction practices shall minimize, wherever possible, the negative impacts on and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;

(c) Where practicable, existing capacity and coordination with different infrastructure services shall be optimized so that the rural and existing character of the Protected Countryside and the overall hierarchy of areas where growth will be accommodated in the GGH established by the Greenbelt and the Growth Plan are supported and reinforced;

(d) New or expanding infrastructure shall avoid key natural heritage features, key hydrological features or key hydrologic areas, unless need has been demonstrated and it has been established that there is no reasonable alternative; and,

(e) Where infrastructure does cross the Natural Heritage System or intrude into or result in the loss of a key natural heritage feature, key hydrologic feature, or key hydrologic areas, including related landform features, planning, design and construction practices shall minimize negative impacts on and disturbance of the features or their related functions, and where reasonable, maintain or improve connectivity.

(f) New or expanding infrastructure shall avoid specialty crop areas and other prime agricultural areas in that order of priority, unless need has been demonstrated and it has been established that there is no reasonable alternative; and

(g) Where infrastructure crosses prime agricultural areas, including specialty crop areas, an agricultural impact assessment or equivalent analysis as part of an environmental assessment shall be undertaken.

A number of watercourses designated as 'Urban River Valley' are located within the study area. The Urban River Valleys include Fourteen Mile Creek west of Bronte Road and the second area includes the Glenorchy Conservation Area and Sixteen Mile Creek east of Bronte Road. Bronte Creek is not identified as an Urban River Valley as it is already included in the Greenbelt Natural Heritage System.

Section 6 of the Greenbelt Plan outlines the policies that apply to the 'Urban River Valley' land use designation. Only publicly owned lands are subject to the policies of the 'Urban River Valley' designation. This designation is subject to the applicable Official Plan policies if they have regard for the objectives of the Greenbelt Plan. All existing, expanded or new infrastructure subject to the *Environmental Assessment Act*, is permitted if it supports the needs of adjacent settlement areas or serves the significant growth and economic development expected in southern Ontario and supports the goals and objectives of the Greenbelt Plan. The need for the 407 Transitway was demonstrated in the Corridor Protection Study (1998) and further explanation of the need and justification will be presented in the Environmental Project Report for this study.

In addition, a number of other policies are found under Section 3 of the Greenbelt Plan. In order to support connections between the Greenbelt's Natural Heritage System and the local, regional and broader natural heritage systems of southern Ontario, the following should be undertaken by government and agencies:

- Consider how activities and land use changes within and abutting the Greenbelt relate to the areas of external connections and Urban River Valley areas identified in this Plan;
- Promote and undertake appropriate planning and design to ensure that external connections and
- Urban River Valley areas are maintained and/or enhanced; and
- Undertake watershed planning, which integrates supporting ecological systems with those systems contained in this Plan.

Consideration will be made to minimize impacts to the Urban River Valleys within the 407 Transitway study area. Appropriate mitigation measures will be identified to maintain and/or enhance the Urban River Valleys.

Section 3.2.6.2 of the Greenbelt Plan (2017) outlines policies for considering land conversions or redevelopment in or abutting the urban river valley, and to strive for approaches that:

- Establish or increase the extent or width of a vegetation protection zone in natural self-sustaining vegetation, especially in the most ecologically sensitive areas (i.e. near the stream and below the stable top of bank);
- Increase or improve fish habitat in streams and in the adjacent riparian lands;
- Include landscaping and habitat restoration that increase the ability of native plants and animals to use the valley systems as both wildlife habitat and movement corridors; and
- Seek to avoid or, if avoidance is not possible, minimize and mitigate adverse impacts associated with the quality and quantity of urban runoff into the valley systems.

These considerations will be assessed, and the appropriate environmental protection and mitigation measures will be recommended. Given that the Greenbelt Plan was updated on May 2017, only some of the regional or local Official Plans have completed conformity exercises to address changes to the Greenbelt Plan. However, the land use designations that apply at each of the Urban River Valleys are consistent with the general intent of the Greenbelt Plan.

Niagara Escarpment Plan

The purpose of the Niagara Escarpment Plan is to "provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as continuous natural environment, and to ensure only such development occurs as is compatible with that natural environment" (NEC 2017). The Plan identifies seven land use designations to implement the goal and objectives of the plan: Escarpment Natural Area, Escarpment Protection Area, Escarpment Rural Area, Minor Urban Area, Urban Area, Escarpment Recreation Area, and Mineral Resource Extraction Area.

The lands on the north side of the 407 ETR between Dundas Street and Walkers Line are located within the Niagara Escarpment Plan area. Most of the lands are designated as Escarpment Protection Area, with the natural areas designated as 'Escarpment Natural Area'. Two areas are designated as 'Niagara Escarpment Parks and Open Space System'**. Figure 3.4** presents the Niagara Escarpment Plan land use designations.

The **Escarpment Natural Area** includes valleylands, wetlands, and woodlands that are relatively undisturbed, as well as cultural heritage resources, wildlife habitat, geologic features and natural features (especially those that provide essential ecosystem services). The policies of the Niagara Escarpment Plan aim to protect and enhance these natural areas.

The **Escarpment Protection Area** contains rural land uses such as residences, residential business and residential farming operations. The Niagara Escarpment Plan identifies these areas as being important due to their visual prominence and environmental significance as well as their increased resilience to climate change through ecosystem services. These areas are also often modified by land use activities and serve as a buffer for significant Escarpment Natural Areas.

FIGURE 3.3: 407 TRANSITWAY WEST – REGIONAL LAND USE WITHIN THE STUDY AREA

FIGURE 3.4: 407 TRANSITWAY WEST – PROVINCIAL PLANS

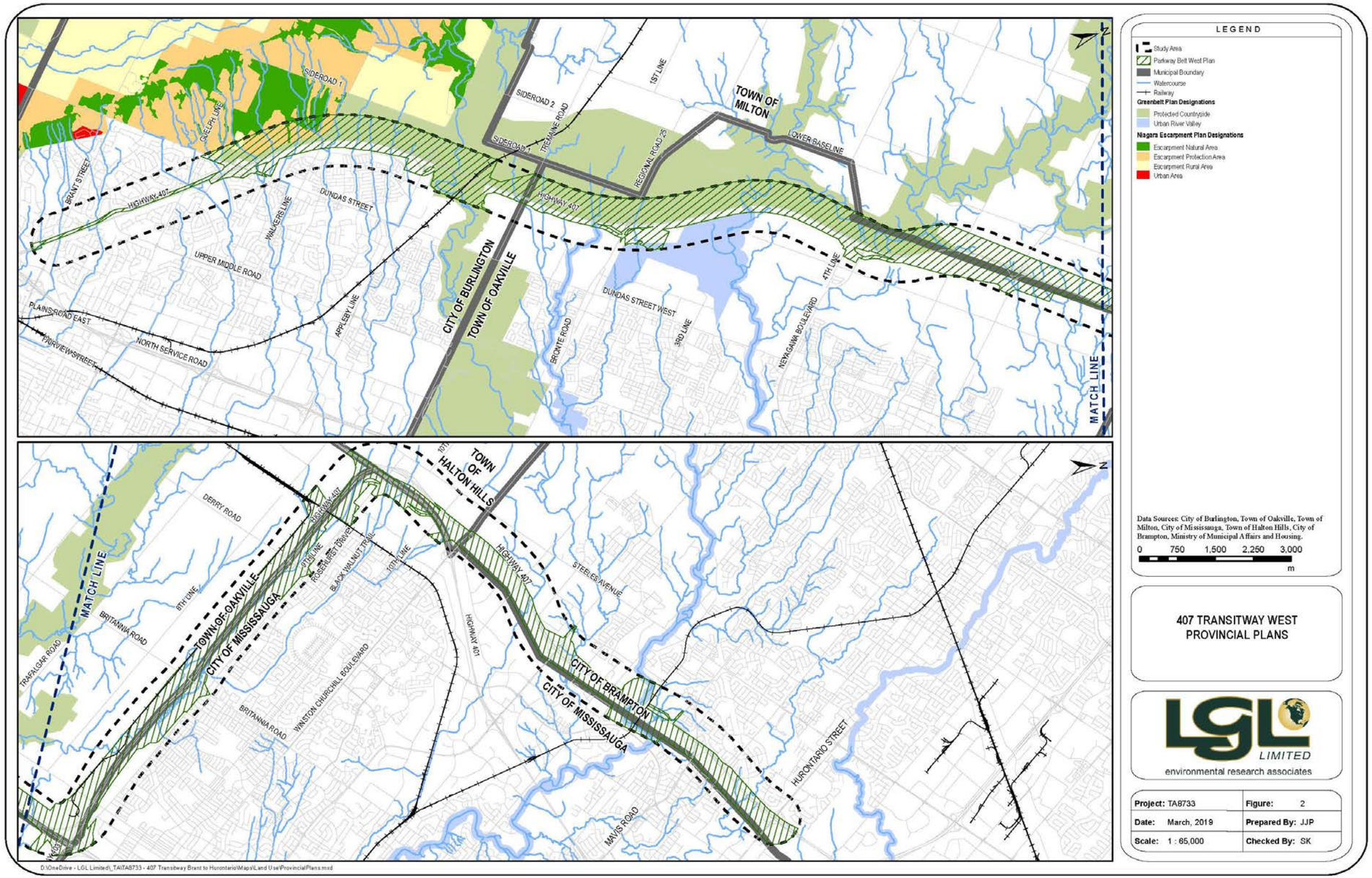


FIGURE 3.5A: 407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA

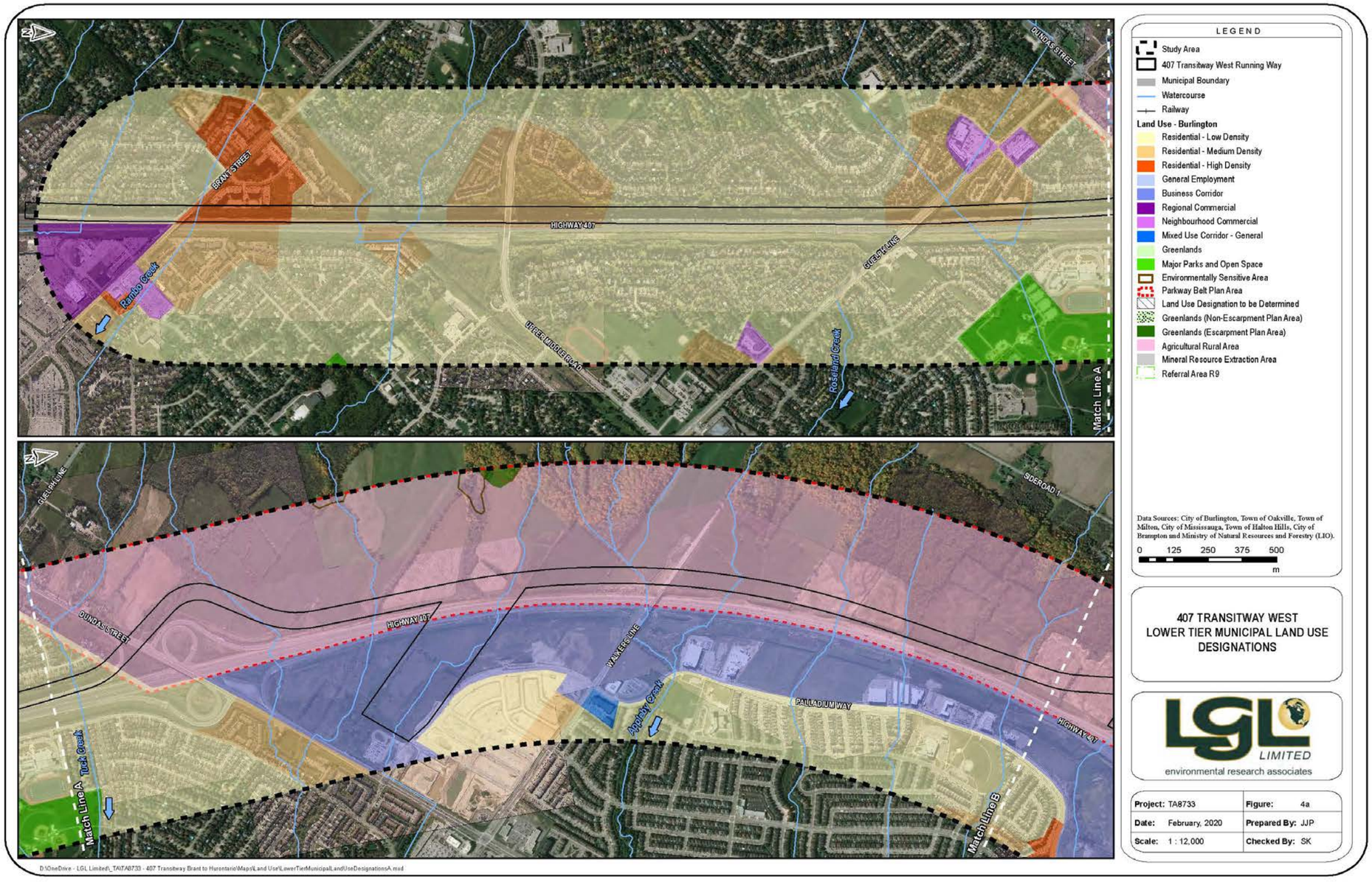


FIGURE 3.5B: 407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA

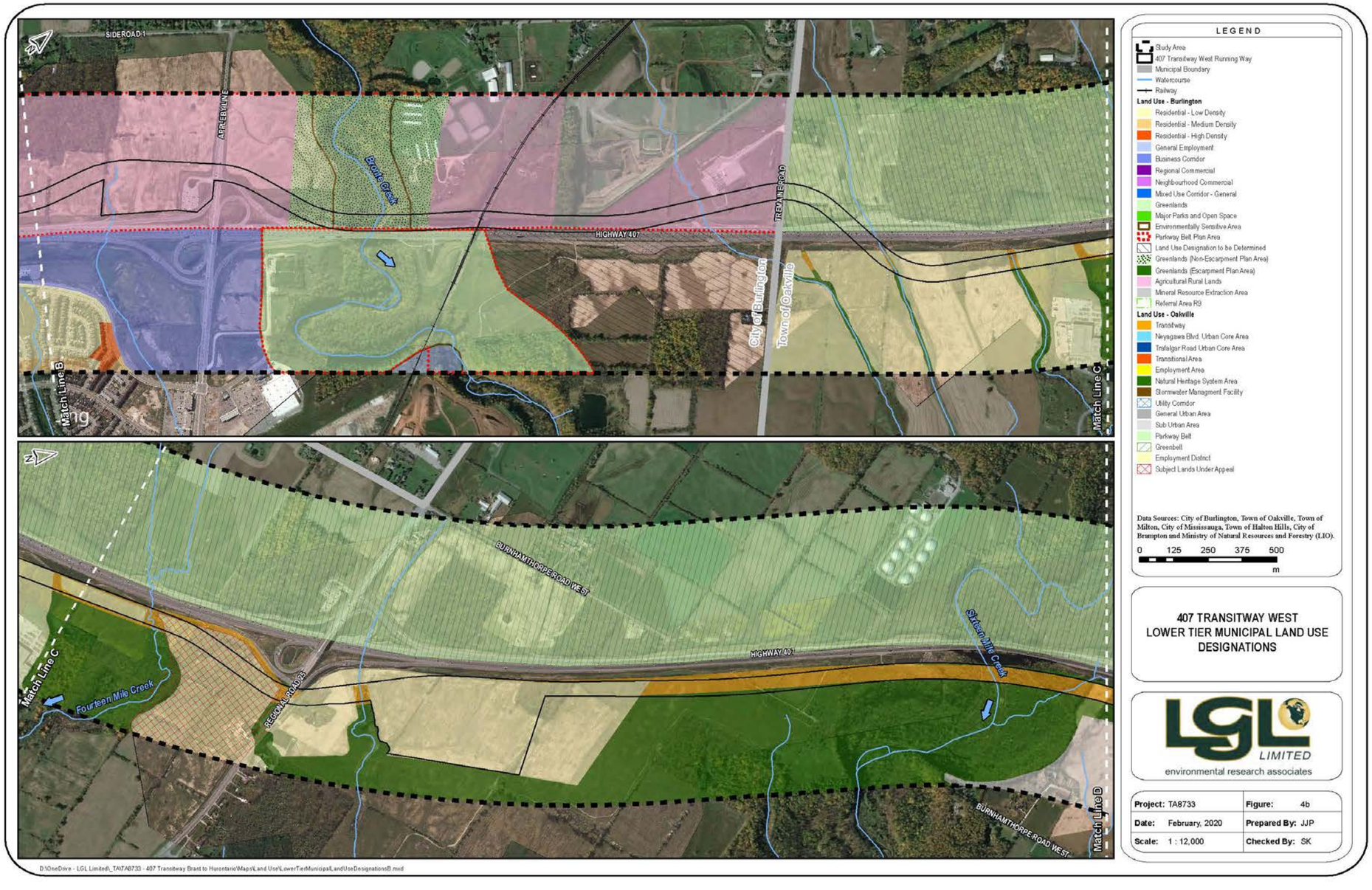


FIGURE 3.5C: 407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA

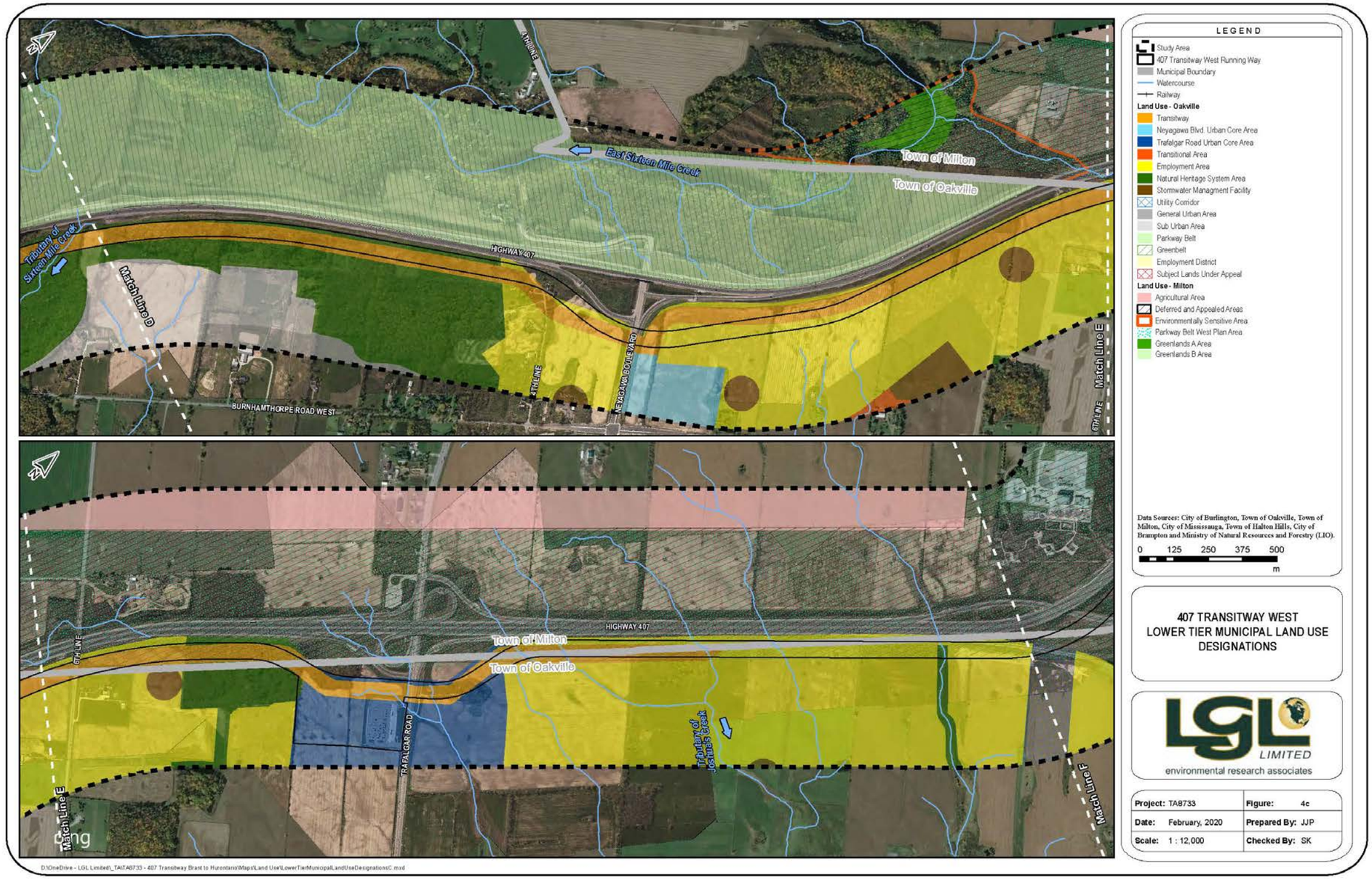


FIGURE 3.5D: 407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA

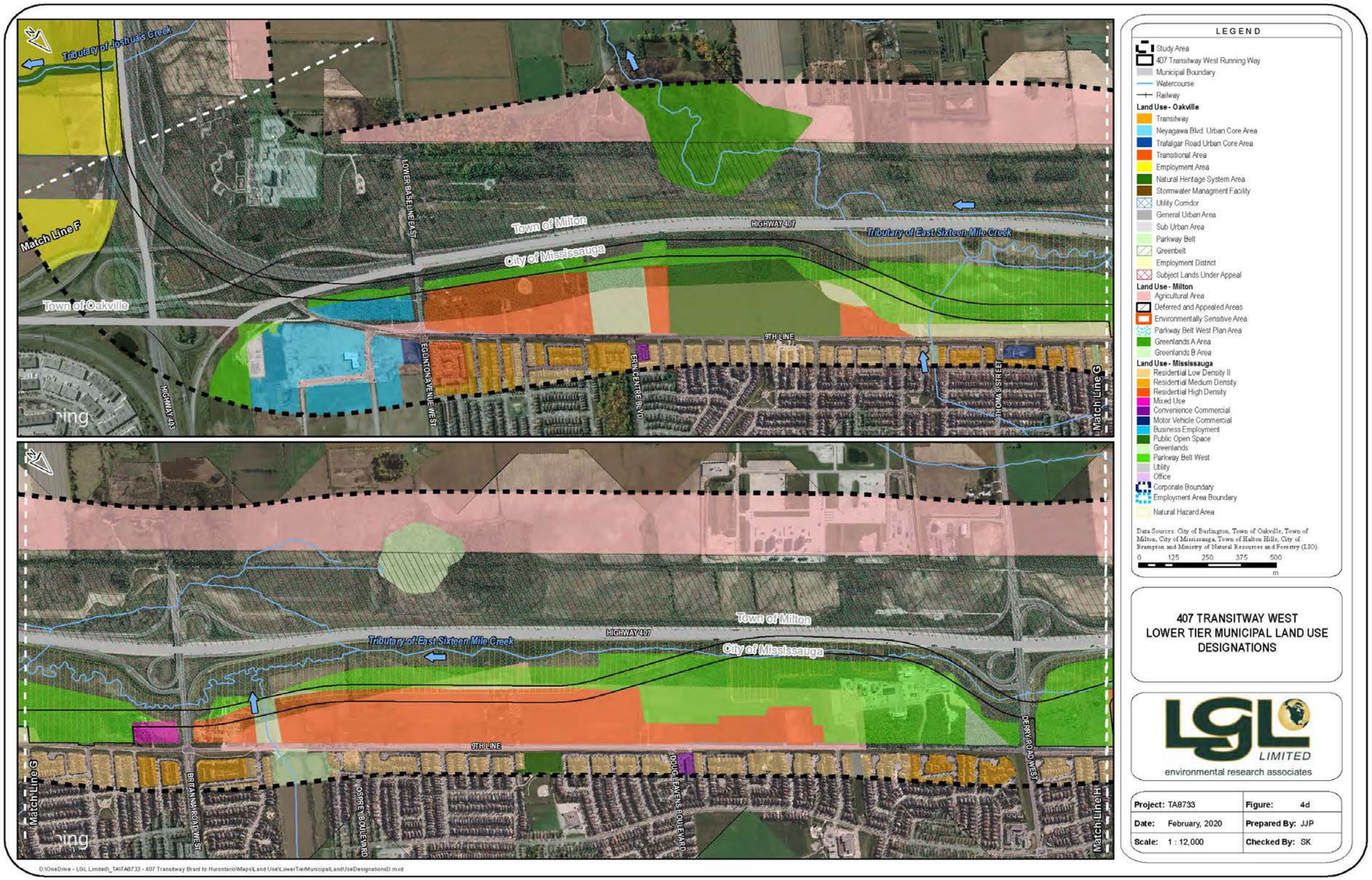


FIGURE 3.5E: 407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA

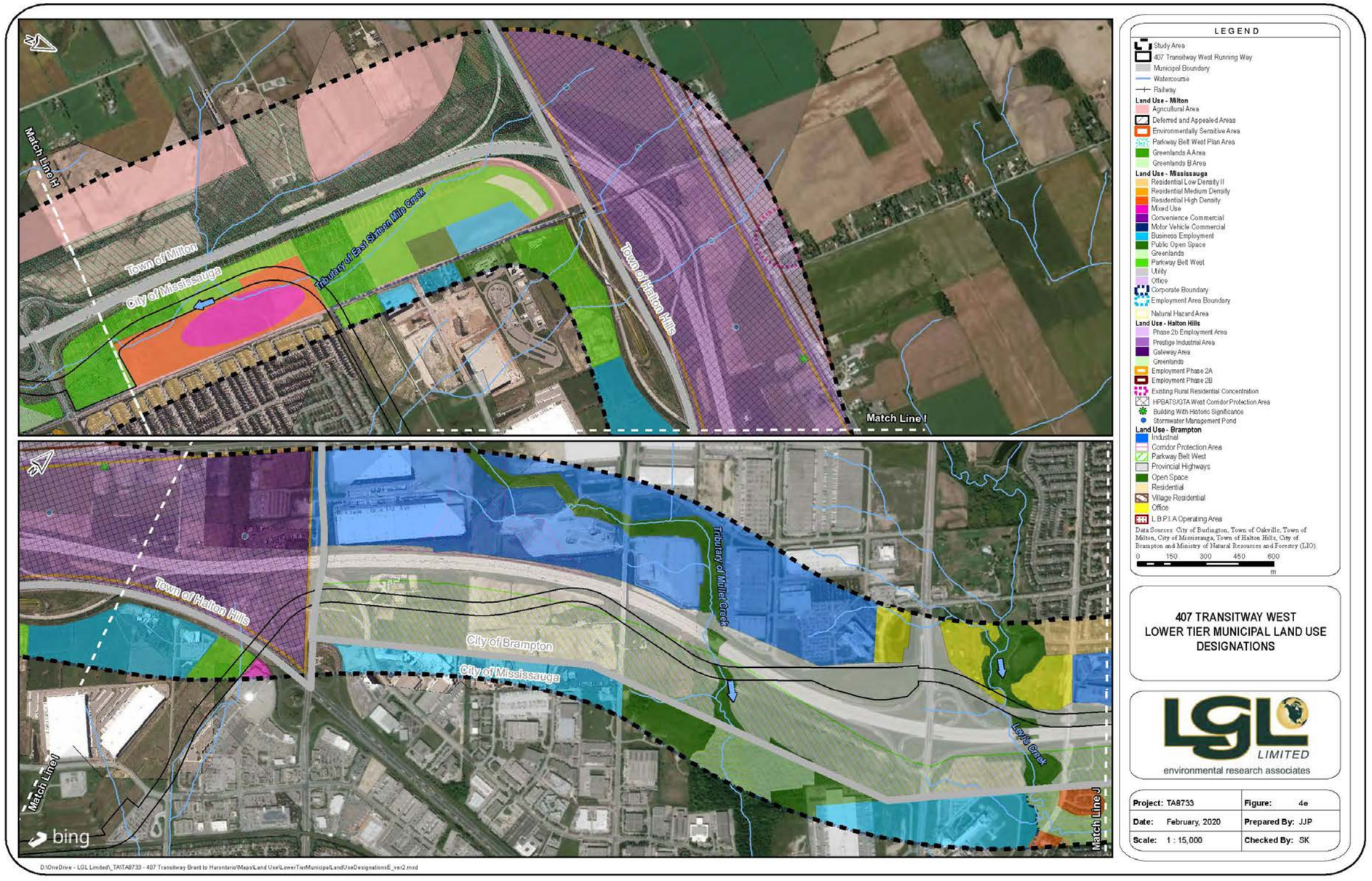
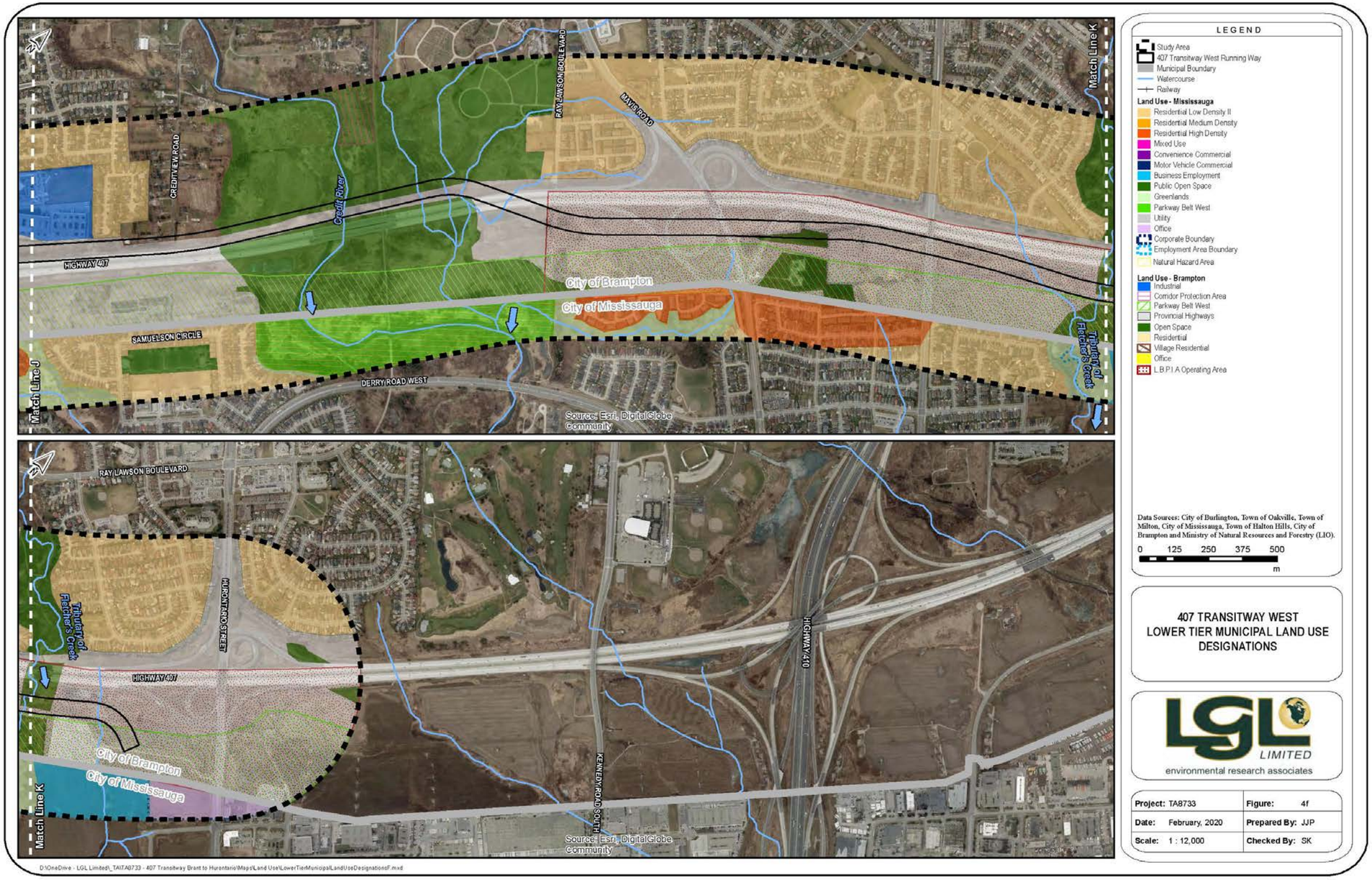


FIGURE 3.5F: 407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA



The **Niagara Escarpment Parks and Open Space System** is a system of parks and open spaces connected to the Bruce Trail. These lands are publicly owned and are key to protecting cultural heritage and natural heritage. Natural areas also help to mitigate and improve resilience to climate change. Subject to the policies of Part 2 (Development Criteria) of the Plan, transportation and utility land uses are permitted. The Niagara Escarpment Plan indicates that new and reconstructed transportation and utility facilities must be designed and located to minimize impact on the Escarpment environment and be consistent with the objectives of the Plan. New transportation and utility facilities should avoid Escarpment Natural Areas, prime agricultural and specialty crop areas. Site and design guidelines are provided, including:

- minimize blasting, grading and tree removal through alignment selection and design;
- slopes should be graded no steeper than 2:1 slope and planted;
- large cuts should be terraced to address potential for surface erosion and slope failure;
- site rehabilitation should include native species of vegetation protect and enhance the natural environment;
- development setback from the Escarpment brow to minimize visual impacts; and
- visual impacts from infrastructure should be minimized by siting, structural design, colouration, and landscape planting/vegetation screening.

Metrolinx Regional Transportation Plan

The Regional Transportation Plan (RTP), also known as "The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area", released by Metrolinx (2008 – Approved Changes February 14, 2013), provides a vision, goals and objectives for the future in which transportation within the Greater Toronto and Hamilton Area is seamless, coordinated, efficient, equitable and user-centred. It reaches out 25 years into the future to guide and direct decision-making. Some of the goals and objectives presented in the RTP to guide decision-making applicable to the 407 Transitway include:

- increase of transportation options for accessing a range of destinations;
- improved transportation experience and travel time reliability; and,
- lower average trip time for people and goods.

The RTP allows for a regional rapid transit network that operates seamlessly across the region. The 407 Transitway was highlighted as a project for completion in 16 to 25 years and beyond of the RTP's adoption. The section of the 407 Transitway from Brant Street to Hurontario Street is currently planned for the long-range planning horizon. A 'Gateway Hub' is identified at the west end of the study area near Downtown Burlington. Gateway Hubs are located at key intersections of the rapid transit network that provide access to transit, support high density development, and demonstrate excellence in customer service. The Big Move also identifies a regional rail service between Milton and Meadowvale (25 Year Plan) that crosses the 407 Transitway study area.

The 2041 Regional Transportation Plan for the Greater Toronto and Hamilton Area (adopted in 2018) continues the work from the Big Move. The Plan was authorized by Metrolinx and developed alongside experts all over the GTHA and the Go Transit service area municipalities. The Plan outlines how governments and transit organizations can work together to build a transportation system that puts travelling needs at the core of planning and operations. The Plan supports the creation of a transit network that is comprehensive, connected, accessible, sustainable and focused on people. Within the Plan, other regional transit facilities/networks in delivery or in development located in the vicinity of the study area are identified.

The Plan sets the foundation of future and frequent rapid transit and advances key rapid transit projects. The 407 Transitway will complement the existing network and contribute to the momentum of being part of North America's largest rapid transit expansion program.

The Plan identifies other regional transit facilities/networks in delivery or in development located in the vicinity of the study area:

- Dundas Street (Regional Road 5) Bus Rapid Transit (BRT) Corridor for between Brant Street and Trafalgar Road, City of Burlington and Town of Oakville, Halton Region;
- Mississauga Transitway dedicated bus corridor is located parallel to Highway 403 and will connect 407ETR/Highway 403 in the west with Highway 427/TTC on Eglinton Avenue in the east;
- Hurontario Light Rail Transit (LRT) Corridor from Port Credit GO Station to Brampton Gateway, City of Mississauga;
- Downtown Milton to Union Station/Summerhill Regional Rail Corridor; and,
- Local priority bus routes along municipal roads.

Parkway Belt West Plan

The Parkway Belt West Plan (PBWP) was implemented for the purposes of creating a multi-purpose utility corridor, urban separator and linked open space system. Its purpose is to link urban areas with each other by providing space for the movement of people, goods, energy, and information, without disrupting community integrity and function. The Parkway Belt West Plan was developed to provide a land reserve for future linear facilities and for unanticipated activities requiring sites of high accessibility and substantial land area.

The original PBWP was approved by the Lieutenant Governor in Council in 1978. Since its approval, the PBWP had been subject to numerous amendments. An application to amend the PBWP has been made, to make changes to the Inter-Urban Transit designation for the 407 Transitway. The amendment will realign the Inter Urban Transit designation from Highway 400 (City of Vaughan) to Kennedy Road (City of Markham) as per MTO's completed Environmental Assessment; and, add lands to the Inter-Urban Transit Designation from Highway 407 (Town of Oakville) to Brant Street (City of Burlington) to implement recommendations of MTO's 2005 West Corridor Protection Study in advance of the completion of this 407 Transitway study. **Figure 3.5** presents the boundary of the Parkway Belt West Plan throughout the study area.

The area covered by the Plan is divided into two general land use categories: the 'Public Use Area' and the 'Complementary Use Area'. 'Public Use Areas' are defined as presently used or to be predominantly used in the future for public uses. The 'Public Use Areas' consist of areas designated as: 'Public Open Space and Buffer Area'; 'Utility', 'Electric Power Facility'; 'Road'; and, and 'Inter-Urban Transit'. 'Complementary Use Areas' are to be predominantly used for private uses that aid in the PBWP's objective of preserving the country landscape and encouraging land uses such as agricultural, recreational and institutional pursuits that do not require intense urbanization. The 'Complementary Use Areas' consist of the 'General Complementary Use Area' and the 'Special Complementary Use Area'. All of these land use designations are found within the PBWP lands within the study area.

Draft Agricultural Impact Assessment Guidance Document

The Ontario Ministry of Agriculture, Food and Rural Affairs' Agricultural Impact Assessment (AIA) Guidance Document provides technical information and includes resources that avoid, minimize, and mitigate impacts on agriculture. AIAs function like a tool that identifies and evaluates the impacts of nonagricultural uses on agricultural lands. The main objective of AIAs is to ensure that farmland, farm operations and supporting infrastructure, services and assets are sustained to support a prosperous agri-food sector and strong rural communities. The four (4) Provincial plans (mentioned above) include policy requirements for the agricultural system and proposed infrastructure projects. The Plans provide policy direction to municipalities on how to implement, protect and enhance the agricultural system.

The land use planning requirements for completing an AIA are dependent on the proposed type of nonagricultural use and the scale of the proposed development, its location, and land use designations. Since the Transitway study area lies within the GGH and consists of constructing a planned corridor with supporting facilities, the study considers and complies with the requirements of an AIA, even though approval is not required. Impacts to the agricultural system have been avoided where possible and alternate locations based on assessing potential impacts to the agricultural land base and agri-food network were investigated where possible. AIA requirements were satisfied through the existing EA framework thus the reporting in this document closely aligns with the reporting requirements stipulated in the Guidance Document. The structure for an AIA consists of ten (10) components:

- Introduction;
- Process;
- Study area identification;
- Study methodology;
- Description of soils, land use etc.;
- Assessment of impacts;
- Mitigation measures;
- Net impacts;
- Study recommendations and conclusions; and,
- Appendices.

Region of Halton Official Plan

According to Census Canada (Statistics Canada, 2016), Halton Region has a population of approximately 548,435 (increased approximately 9.3% from 2011). A Place to Grow Growth Plan for the Greater Golden Horseshoe has identified growth projections for the Region of Halton, including a total of 820,000 residents and 390,000 jobs by 2031.

The Region of Halton Official Plan was adopted by Regional Council in 2009 and approved with modifications by the Ministry of Municipal Affairs in 2011. The Ministry approval was appealed to the Ontario Municipal Board (OMB) and has been the subject of the OMB board hearing process since 2012 through 2017. Several decisions have been made by the OMB in 2014, 2015, 2016, 2017 on the basis of the approvals of amendments, which have been reflected in the Interim Office Consolidation (2018) of Regional Official Plan. The Region commenced the Municipal Comprehensive Review process in 2014 with Council endorsement of the Phase 1 Directions Report and work plan. The Regional Official Plan Review (ROPR) includes three (3) phases: Phase 1: Directions Report which was completed in October 2016. Phase 2: Research, Analysis and Discussion Papers and Phase 3: Policy Directions and Official Plan Amendment. The Region is currently in Phase 2: Discussion Papers which is planned to be completed by early 2021.

The study area is located along the 407 ETR corridor, which is designated as a provincial freeway in the Official Plan. The study area is generally located within the 'Urban Area', the 'Regional Natural Heritage System', and 'Greenbelt Natural Heritage System'. Most of the study area is located within the Built Boundary, as defined in the Growth Plan for the Greater Golden Horseshoe and the Parkway Belt West Plan area. The study area between Dundas Street and Appleby Line, and west of Tremaine Road to Ninth Line is located both within and outside of the Region's Urban Area. In addition, lands part of the Ninth Line study area are identified under the 'Agricultural Area' and 'Regional Natural Heritage System' land use designation, outside of the Urban Area.

Agricultural Area includes areas that maintain a permanently secure, economically viable agricultural industry and preserve the open-space character and landscape of Halton's non-urbanized areas.

Urban Area includes those areas that have urban services that can accommodate concentrations of existing and future development.

Regional Natural Heritage System includes the system of connected natural areas and open space needed to preserve and enhance the biological diversity and ecological diversity and ecological functions within Halton Region (Halton Official Plan; 51(3)).

All lands designated as **Greenbelt Natural Heritage System** in the Official Plan are subject to the policies of the Greenbelt Plan as well as the policies of the Official Plan.

In general, the Region's Official Plan promotes the integration of transit and active transportation into the planning of the region. The Halton Region Official Plan states that it is committed to developing a balanced transportation system that reduces dependency on vehicles; includes a safe, convenient, accessible, affordable and efficient public transportation system that is competitive with the private automobile; and promotes active transportation.

The study area is identified as a 'Higher Order Transit Corridor' under Map 3 Functional Plan of Major Transportation Facilities of the Halton Region Official Plan. These corridors are intended to serve inter-

municipal and inter-regional travel demands by public transit. These corridors are often located along areas identified as an Intensification Corridor that can support transit-supportive, mixed use, high density development. High Order Transit Corridors accommodate higher order transit and serve to connect Urban Growth Centres and Mixed Use Nodes. A Mobility Hub is located at the west end of the transitway (near Brant Street and Plains Road East along the CNR), and a Proposed Major Transit Station is proposed near the east end, in the Town of Milton (Trafalgar Road and Derry Road near CPR). While the Mobility Hub and Proposed Major Transit Station are located outside the study area, the 407 Transitway will help to meet the goal of connecting these key areas with higher order transit.

City of Burlington Official Plan

The City of Burlington Official Plan was approved by the Region of Halton in 1997 and approved by the Ontario Municipal Board in 2008. The April 2017 Office Consolidation includes updates to the Official Plan since its approval. Currently there is a proposed 2018 Official Plan. The City of Burlington received notice from the Region of Halton regarding the City's Official Plan. The notice advised the City that the adopted Official Plan does not conform with the Regional Official Plan on various policies and mapping. Those areas that pertain to this report include areas of:

- the identification of and permitted uses within agricultural lands and
- the identification of and permitted uses within the Natural Heritage System.

The City of Burlington is now making modifications before the Official Plan can be approved by Halton Region. The study area is divided into two planning areas: Urban Area and Rural Area. The Rural Area includes the north side of the 407 ETR from Dundas Street to the municipal Boundary.

Urban Area

The lands between Brant Street and Tremaine Road are located within the City of Burlington. Between Brant Street and Dundas Street, the study area is designated primarily as 'Mixed Use Commercial Centre' 'Residential – Low Density', with smaller areas designated as 'Residential – Medium Density', and 'Residential – High Density', 'Regional Commercial', and 'Neighborhood Commercial'.

On the south side of 407 ETR between Dundas Street and just east of Appleby Line, the lands are designated as 'Business Corridor' adjacent to the highway, followed by smaller areas of 'Residential' (low, medium and high density) further set back from the highway.

East of Appleby Line, the lands surrounding Bronte Creek are designated as 'Greenlands' and the lands at the east limit of the study area are 'Land Use Designation to be Determined.

Rural Area

The majority of the study area is designated as 'City's Natural Heritage System' and 'Agricultural Land Base' (Prime Agricultural Area). Other land uses include 'Greenbelt Natural Heritage System' 'Agricultural Area' and 'Mineral Resource Extraction Area'.

'Environmentally Sensitive Areas' have been identified based on Region of Halton mapping. The Niagara Escarpment Plan area is located just north of the study area. The Plan area identifies lands classified as 'Escarpment Protection Area' adjacent to the study area. None of these areas would be impacted by this study; however, portions of the 'Environmentally Significant Areas' do extend south into the study area.

Deferrals and Referrals to the Official Plan A number of properties within the study area are subject to deferrals or referrals under the Official Plan. **Table 3.7** summarizes the outstanding deferrals/referrals at the time of the Official Plan consolidation.

TABLE 3.7: SUMMARY OF OFFICIAL PLAN DEFERRALS AND REFERRALS

DEFERRAL/REFERRAL NO.	LOCATION	REQUESTED BY	STATUS
D31/D32	South of 407 ETR, along Bronte Creek, part of Alton Community	Deferred by the Region of Halton	Still outstanding. Until remaining unapproved portions of the Alton Community Secondary Plan and OPA 3 are approved, existing uses, agricultural uses, and those permitted by the Zoning By-law and Parkway Belt West Plan are permitted.
D40	South of 407 ETR, west of Tremaine Road	Deferred by Evergreen Community (Burlington) Ltd. Case No. PL111358, PL110857, PL091166	In a 2013 OMB order, Evergreen matters were deferred until the ROPA 38 are determined and to wait until ongoing secondary studies are complete. The OMB decision (April 6, 2016) dismissed the Evergreen appeal. Concerns regarding buffers from the natural heritage features will be addressed through an environmental impact statement in the future. Now that the appeal at the OMB is resolved, the Tremaine Dundas [Evergreen] Secondary Plan is being prepared. OPA No. 107 (OPA 107) adopted by the City of Burlington Council through By-law No. 56-2018 was enacted and passed in 2018. OPA 107 includes updates to the policies and schedules of the Burlington Official Plan pertaining to the Tremaine Dundas Secondary Plan Area including revised land use designations. The written submissions received by Halton Region regarding OPA 107 were considered as part of the review process. These written submissions resulted in the identification of a 60 m Protected Corridor for the Study Area of the 407 Transitway EA.
R9	North of 407 ETR, on north side of Dundas Street east of Guelph Line	Referred by Dunburlton Developments Limited (now P & L Livestock Limited)	For the lands shown on Schedule C of the Official Plan, policies in the following sections are referred: Part IV Section 2.2 Agricultural Rural Area, Part IV 2.4 Greenlands (Non-Escarpment Area), Part II 3.4.2 a) Long Term Transit Network, Part IV 2.1.3 j), and Part VII Table 1 Function and Classification of Transportation Facilities.

Summary of Land Use Designations

Table 3.8 describes the land use designations for the study area in the City of Burlington. The following is a summary of the permitted uses for each designation, as permitted in the Official Plan Office Consolidation (2017).

TABLE 3.8: LAND USE DESIGNATIONS IN THE CITY OF BURLINGTON

LAND USE DESIGNATION	PERMITTED USES
'Residential – Low Density'	Single detached and semi-detached homes with a density of up to 25 units per net ha, as well as ground oriented housing provided they are compatible with the area
'Residential – Medium Density'	Ground or non-ground oriented housing units with a density of 26 to 50 units per net ha
'Residential – High Density'	Ground or non-ground oriented housing units with a density of 51 to 185 units per net ha
'Regional Commercial'	Wide range of retail and service commercial uses and community facility that serve the city and adjacent municipalities
'Neighbourhood Commercial'	Local shopping that meets resident's day to day and weekly goods and services requirements
'Business Corridor'	Prestige type offices and uses that require good access and visibility along major transportation corridors
'Greenlands'	Greenlands System is to permanently protect natural heritage system. The uses that may be permitted, subject to Official Plan policies, include existing uses; forest, fish and wildlife management; essential transportation and utility facilities; among others
'Land Use Designation to be Determined'	Applies to lands where planning studies are underway and the permitted land uses will be determined at the completion of those studies
'Agricultural – Rural Area'	Identified for long term preservation of agricultural uses and open space character of rural areas. The uses that may be permitted, subject to Official Plan policies, include existing uses, agricultural uses, transportation and utility facilities, among others
'Greenlands – Non Escarpment Plan Area'	Areas with this designation include: ANSIs, significant valleys, wetlands, woodlots, hazard lands and wildlife habitat, ESAs, and PSWs (or regionally significant wetlands. Uses that may be permitted include existing uses, recreation, essential transportation and utility facilities among others
'Mineral Resource Extraction Area'	Protects legally existing pits and quarries licensed under the *Aggregate Resources Act* from incompatible uses. Uses that may be permitted include: agriculture, existing uses, essential transportation and utility facilities, among others
'Environmentally Sensitive Areas'	The boundaries of these areas are as determined by the Region of Halton. Alteration of these areas is prohibited. An Environmental Evaluation Report is required for development within 50 m of an ESA

City of Oakville Official Plan

The North Oakville East and West Secondary Plans provide a planning framework for the lands north of Dundas Street and south of Highway 407 between Ninth Line in the east and Tremaine Road in the west.

A review of the North Oakville Plans as required by the Planning Act, is being undertaken in conjunction with the Official Plan Review of Livable Oakville. It is a major component to bring the North Oakville Plans into the Livable Oakville Plan so that the Town has one Official Plan document. The North Oakville Plans are in full force effect apart from lands under appeal to the LPAT located along Bronte Road between Dundas Street West and Highway 407.

The study area is located within the 407 North planning area (north of 407 ETR), North Oakville West Secondary Plan area and North Oakville East Secondary Plan area. Sixteen Mile Creek is the boundary between the west and east North Oakville Secondary Plan areas. Both Secondary Plans identify the 407 Transitway runningway and stations, as identified in the 407 West Transitway Corridor Protection Study (MTO 2005). The following outlines the land use policy framework for this area.

407 North Planning Area

The lands included in the 407 North Planning Area (Figure 6 in **Appendix I** of this EPR) are bound by 407 ETR, Tremaine Road, Burnhamthorpe Road, Regional Road 25, Lower Base Line, and Fourth Line. These lands are designated as 'Parkway Belt' and 'Greenbelt'. Lands designated as 'Parkway Belt' are subject to the policies of the Parkway Belt West Plan. The Town supports to removal of any lands from this Plan area, so that it can be subject to the Town's Official Plan. Lands designated as 'Greenbelt' are subject to the policies of the Greenbelt Plan.

North Oakville – West Secondary Plan

In west North Oakville, the land use designations include 'Employment District', 'Natural Heritage System Area', and 'Area Still Under Appeal'. Descriptions of the permitted uses within these land use designations are summarized in **Table 3.9**

The Secondary Plan indicates that the Town supports the Province proceeding with the planning and design for the 407 Transitway and terminals. The Town recommended that the width of the Transitway corridor be minimized where possible to maximize the land available for development. It was recommended that terminals be designed to provide inter-regional, regional and local transit connections. Since the land uses surrounding the terminals are 'Employment Districts', the stations should be designed to accommodate mixed use, keeping in mind that residential uses are prohibited, and commercial uses are limited (Oakville 8.7.2.2).

Land uses are restricted in the Natural Heritage System Areas land use designation. Section 8.4.7.3(c)(ii) of the North Oakville West Secondary Plan indicates that transit corridors are permitted if they:

- Use non-standard cross sections designed to minimize any impacts on the natural environment;
- Permitted to cross this land use designation in the general area of the road designations or as defined through an Environmental Assessment; and,
- Are designed to minimize grading in accordance with the directions established in the North Oakville Creeks Subwatershed Study.

The Official Plan identifies criteria for these required transit routes or utility corridors. They should be located outside of natural features to the maximum extent possible, where the applicable designation is narrowest and along the edges of applicable designations, wherever possible. The design and construction of the corridor should provide for the safe movement of species in accordance with the North Oakville Creeks Subwatershed Study. The width of the corridor should be kept to the minimum required. The design of the transit facility should keep related structures or parts of structures outside

the High Constraint Stream Corridor area to the maximum extent possible or as defined through an Environmental Assessment (North Oakville West Secondary Plan 8.4.7.3(c)(ii)).

North Oakville – East Secondary Plan

In east North Oakville, the land use designations include 'Natural Heritage System Area', 'Employment District', 'Neighbourhood Area', 'Neyagawa Urban Core Area', 'Trafalgar Urban Core Area', 'Transitway', 'Underlying Land Use Not Determined', and 'Utility Corridor'. Descriptions of the permitted uses within these land use designations is summarized in **Table 3.9.**

The Secondary Plan indicates that the Town supports the Province proceeding with the planning and design for the 407 Transitway and terminals. The Town recommended that the width of the Transitway corridor be minimized where possible to maximize the land available for development. It was recommended that terminals be designed to provide inter-regional, regional and local transit connections. The stations should be designed to accommodate mixed use that are suitable for the surrounding area/proposed uses (Oakville 7.7.2.2).

Land uses are restricted in the Natural Heritage System Areas land use designation. Section 7.4.7.3(c)(ii) of the North Oakville East Secondary Plan indicates that transit corridors are permitted subject to certain requirements. These requirements are the same as those outlined above for the West Secondary Plan. The road designations for the East Secondary Plan are outlined on the Town of Oakville's Figures NOE2 and NOE4, and the High Constraint Stream Corridors are shown on Figure NOE3 (refer to **Appendix I** of this EPR).

TABLE 3.9: LAND USE DESIGNATIONS IN THE TOWN OF OAKVILLE

LAND USE DESIGNATION	PERMITTED USES
West North Oakville	
'Employment District'	Employment generating uses, including a wide range of industrial and office, and limited retail and service commercial uses
'Natural Heritage System Area'	Comprised of Core Preserve Areas, Linkage Preserve Areas, Glenorchy Conservation Area, high constraint stream corridors, medium constraint stream corridors, and other hydrological features. Permitted uses include legally existing uses, buildings and structures, and fish, wildlife and conservation management
East North Oakville	
'Employment District'	Employment generating uses, including a wide range of industrial and office, and limited retail and service commercial uses
'Natural Heritage System Area'	Comprised of Core Preserve Areas, Linkage Preserve Areas, Optional Linkage Preserve Areas, high constraint stream corridors, medium constraint stream corridors, and other hydrological features. Permitted uses include legally existing uses, buildings and structures, and fish, wildlife and conservation management
'Trafalgar Urban Core Area'	Neighbourhoods will include a mix of development: Neighbourhood Centre, General Urban, and Sub-urban
'Neyagawa Urban Core Area'	Mixed Use area with a range of commercial, residential and institutional uses. Commercial uses will be standalone or in the ground floor of mixed-use buildings. This land use designation is a focal point at the western area of the Secondary Plan area. Densities are lower than the Trafalgar Urban Core
'Trafalgar Urban Core Area'	Will serve as a Major Node that is pedestrian and transit oriented. Permitted uses will include employment, commercial, accommodation, institutional, cultural, health and medical, entertainment uses, medium and high density residential, public uses (urban squares, parking)

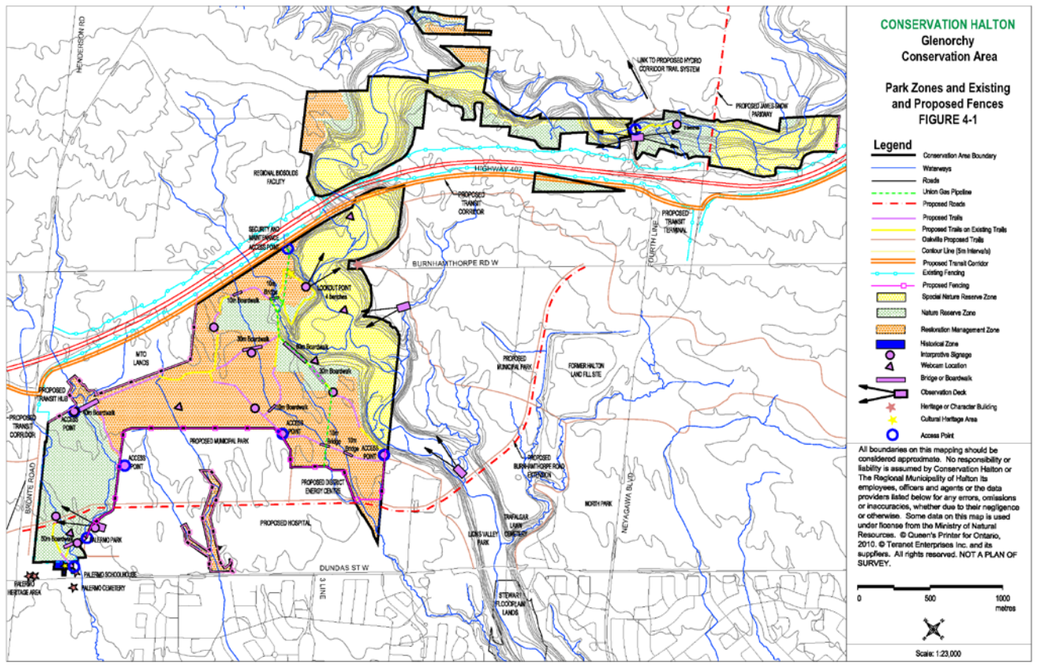
Glenorchy Conservation Area

A large area in North Oakville is part of the Glenorchy Conservation Area, managed by Conservation Halton. **Figure 3.6** presents the location of this area, the North Oakville Natural Heritage System, and the designated natural areas present in the area. The Glenorchy Conservation Area is part of the 'Urban River Valley' designation of the Greenbelt P lan. The Master Plan for the Glenorchy Conservation Area identifies the sensitivity/significance of this area, identifies a master plan (i.e. restoration, management policies, education and recreation opportunities), and outlines a detailed Master Plan policy framework.

The 407 Transitway is identified in the Management Plan along the south side of the 407 ETR. The Management Plan classifies the adjacent areas into Park Zones. The study area is classified as 'Restoration Management Zone' west of Sixteen Mile Creek (south of 407 ETR), 'Special Nature Reserve Zone', along Sixteen Mile Creek and its valleylands, and 'Nature Reserve Zone' in a small triangular piece of land west of Neyagawa Boulevard on the south side of the 407 ETR.

Restoration Management Zones are intended to provide opportunities for intensive restoration activities to restore, complement or buffer Nature Reserve or Nature Reserve "Special" Zones. Special Nature Reserve Zones are to be protected and preserved as they contain unique valleylands. Permitted uses are very limited within this area. Nature Reserve Zone protects areas with important ecological functions. Permitted uses include passive and low intensity recreation, appropriate scientific research, and forest and wildlife management.

FIGURE 3.6: GLENORCHY CONSERVATION AREA MANAGEMENT PLAN



Town of Milton Official Plan

The Official Plan was approved by Council in 1996, approved by Halton Council in 1997 with deferrals, and approved by the Ontario Municipal Board in 1999. The Office Consolidation of the Official Plan was completed in August 2008. Official Plan Amendment (OPA) 31 brings the Official Plan into conformity with the Growth Plan for the Greater Golden Horseshoe, and the Sustainable Halton Plan. The OPA was approved by the Town of Milton Council in 2010 but is still under review by Halton Region.

The vision and strategies outlined in the 1999 Official Plan are not reflective of the latest planning directions in the Town of Milton. The unapproved OPA 31 identifies a renewed vision for the Town, as well as a planning framework that conforms with the Growth Plan and the regional Official Plan. OPA 31 identifies Strategic Policies related to growth and intensification identify key goals for transit within the municipality. Examples of these policies include mixed use and transit prioritized within intensification areas; appropriate employment and institutional uses are encouraged at major transit stations (including the Milton GO Station); and better integration of transit with neighbourhoods while maintaining the character of these communities.

The Official Plan identifies Transitway/Busway Corridors (High Order Transit Corridors in OPA 31) for inter-regional, regional and local bus routes. These corridors should connect Urban Growth Centres, Mixed Use Nodes, and accommodate higher order transit services. Exclusive use of this corridor should be used for transit vehicles, where possible. In addition, transit supportive, high density, mixed use development should be located around stations planned along these corridors. Major Transit Stations will connect higher order transit services and other transportation modes. A Major Transit Station is located on Trafalgar Road at the CNR. While this is located outside (west of) the study area, it is located along the railway that connects to the study area.

Regional staff has worked with Town Staff to identify modifications to OPA 31 to ensure its conformity with the substantially approved version of ROPA 38. In 2018, Council endorsed the proposed regional modifications to OPA 31. The land uses within the study area include: Parkway Belt West Plan, Agricultural Area, Greenlands A Area, Deferred and Appealed Areas, and Environmentally Significant Area. In the OPA 31, the land use designations are slightly different: Parkway Belt West Plan Boundary, Agricultural Rural Area, Natural Heritage System, Greenbelt Natural Heritage System, and Greenbelt Plan Protected Countryside. For a summary of the permitted land use designations within this plan area, refer to **Table 3.10**

The Natural Heritage System includes a range of natural heritage features and is supported by Enhancement Areas, Linkages and Buffers. The Natural Heritage System is located at a number of locations adjacent to the 407 ETR within the study area. Enhancement areas are generally found directly adjacent to the Natural Heritage System, as well as a large section between Lower Base Line and north of Britannia Road on the west side of the 407 ETR. The enhancement areas can include Centres for Biodiversity, which are those areas of sufficient size, quality and diversity that can support a wide range of native species, ecological functions, etc. No known Centres for Biodiversity are located within the study area. OPA 31 includes updated mapping of other land use areas. All of the lands within the study area are identified as Prime Agricultural Lands.

TABLE 3.10: LAND USE DESIGNATIONS IN THE TOWN OF MILTON

LAND USE DESIGNATION	PERMITTED USES (CURRENT OFFICIAL PLAN AUGUST 2008)	OPA 31 CHANGES TO LAND USE DESIGNATIONS (2018)
Parkway Belt West Plan	Linear transportation including necessary accessory facilities are permitted. The lands within this designation are subject to the policies of the Parkway Belt West Plan.	No change.
Agricultural Area	The predominant land use in these areas is agriculture. Transportation and utility facilities are permitted subject to the policies of Section 4.4 of the Official Plan.	Changed to "Agricultural Area". Similar land uses permitted. Subject also to the policies of the Greenbelt Plan and the Parkway Belt West Plan.

LAND USE DESIGNATION	PERMITTED USES (CURRENT OFFICIAL PLAN AUGUST 2008)	OPA 31 CHANGES TO LAND USE DESIGNATIONS (2018)
Greenlands A Area	Includes regulatory flood plains, Provincially Significant Wetlands, significant valley lands or portions of the habitat of endangered or threatened species, as determined by the relevant authority. A general setback of 7.5 m from the stable top of channel bank or 15 m from a stable top of valley bank is required for development, unless can be demonstrated otherwise in an Environmental Impact Statement or Subwatershed Study. Essential transportation and utility facilities are permitted subject to the policies of the Official Plan.	Changed to "Natural Heritage System". Includes the Regional and Greenbelt Natural Heritage System. Includes key features, enhancements, linkages and buffers, significant habitats of endangered or threatened species, Escarpment Natural Area and Protection Area, and regulated flood plains. Setback policy removed. Essential transportation and utility facilities are permitted subject to the Official Plan.
Protected Countryside Area	Not mapped.	New designation "Protected Countryside Area (Greenbelt Plan)". Same policies as the "Natural Heritage System" in the OPA. Subject to the Greenbelt Plan.
Environmentally Significant Area	Includes land and water containing natural features or ecological functions of significance. The ESA within the study area is ESA No. 16 (Sixteeen Mile Creek Valley ESA).	Not mapped.
Special Policy Area 10	The study area north of Britannia Road to Winston Churchill Boulevard is located within Special Policy Area 10. These lands are within a 4 km radius of the AM Radio Transmission Facility at Highway 401 and Trafalgar Road. Subject to policies 3.8.3.2 and 3.9.3.2, Business Park or Industrial Uses are not permitted to exceed a height of 18 m and should limit the use of steel in the building.	Consideration will be given by the Town to limit the height of buildings to 18 m or less and to limit the use of steel in the construction of buildings to demonstrate that the proposed development can be physically integrated with the existing and proposed uses of adjacent lands. Applies to development within the established Urban Area on lands designated Business Park Area.

Town of Halton Hills Official Plan

The Town of Halton Hills Official Plan was adopted by the Town Council in 2006, approved by Halton Region in 2008 and the Office Consolidation was prepared in January 2017. The Official Plan was updated to address the Regional Official Plan, Provincial Policy Statement, Growth Plan and Greenbelt Plan. A number of strategic planning policies were developed as part of the Sustainable Halton initiative. Examples of these policies include: promotion of development that is sustainable, supports public transit and is oriented to pedestrians; an integrated transportation system that safely and efficiently accommodates different modes of transportation; development of alternatives to automobile use (transit, pedestrian, bicycle routes) and housing densities to support the use of these alternatives; and compact urban form in greenfield areas that supports transit. It should be noted that there is currently no transit service provided in the Town of Halton Hills with the exception of the special transit services for the physically disabled (Acti-van). However, the Official Plan policies will encourage a built form that will support transit services in the future.

Within the vicinity of the 407 Transitway study area, the lands along Steeles Avenue (north and South between Eight Line and Winston Churchill) are designated for employment uses. The expectation is for the area to develop as a strategic location that will provide employment opportunities to resident in the Region of Halton and the rest of the GTA.

The Premier Gateway Employment Area is a key component of conformity with the Growth Plan. These lands are intended to attract employment uses to the lands that have good visibility and access along provincial highways. The study area is located within the Premier Gateway Employment Area, located along the north side of Highway 401 and its interchange with the 407 ETR. The dominant land uses within this area include: 'Prestige Industrial Area', 'Gateway Area' which are part of the Employment Phase 2A forecast for implementation 2021-2031. North of Steeles Avenue the lands are designated as 'Phase 2B Employment Area' (also to be implemented 2021-2031) and 'Greenlands'. Within this area there are several buildings with historical significance, existing rural residential concentration, and stormwater management ponds adjacent to the Highway 401 and the 407 ETR. All of these areas are part of the Premier Gateway Employment Area.

The study area is also within the HPBATS/GTA West Corridor Protection Area. The HBATS/GTA West Corridor Protection By-law No. (2014-0050) was adopted by Council on July 7th, 2014. Currently, OPA No. 21 is awaiting Regional approval. The HPBATS/GTA West Corridor Protection Area corresponds with the Route Planning Study Area as identified by the Ministry of Transportation (MTO) through Phase 1 of the GTA West EA process, as well as lands in the vicinity of Tenth Line and Ten Side Road, including the Southeast Georgetown lands which the HPBATS 2031 Recommended Road Network identifies as required for the East-West connection/Norval West By-Pass. Polices in the Official Plan prohibit the development of urban lands within the HPBATS/GTA West Corridor Protection Area, until the completion of the appropriate Environmental Assessments and by amendment to the Town of Halton Hills Official Plan. The land use designations presented in **Table 3.11.**

TABLE 3.11: LAND USE DESIGNATIONS IN THE TOWN OF HALTON HILLS

LAND USE DESIGNATION	PERMITTED USES
Prestige Industrial Area	Employment uses, located in well-designed buildings and structures established on landscaped lots in a visually attractive environment

LAND USE DESIGNATION	PERMITTED USES
	Uses can include: business/professional offices, industrial uses, computer/electronic/data processing facilities, research and development facilities (excluding biomedical waste), printing and associated service establishments, and industrial malls
Gateway Area	This area is to be visually attractive as it is a point of entry into the Town of Halton Hills, and will provide commercial services in support of Prestige Industrial Areas Uses include a full range of service and commercial land uses that will service the employment uses in the Prestige Industrial Area
Phase 2B Employment Area	These lands are an expansion area for employment uses beyond the Prestige Industrial Area. Before these lands can be developed, a Joint Infrastructure Staging Plan, Secondary Plan, financial plans/agreements (where needed), and appropriate development charge by-laws will need to be completed
Greenlands	Implements the Regional Natural Heritage System from the Regional Official Plan

Region of Peel Official Plan

According to Census Canada (Statistics Canada, 2016), Peel Region has a population of approximately 1,381,739 (increased approximately 6.5% from 2011). The Places to Grow Growth Plan for the Greater Golden Horseshoe has identified growth projections for the Region of Peel for a total of 1,770,000 residents and 880,000 jobs by 2031.

The Region of Peel Official Plan (Office Consolidation October 2018) was approved by the Minister of Municipal Affairs and Housing in 1996, and subsequent Official Plan reviews have been completed. The Office Consolidation (2018) reflects the Regional Official Plan Amendments (ROPAs) that were approved following the Official Plan review process that commenced in 2007. Several ROPAs are still under appeal, and the Local Planning Appeal Tribunal (LPAT) hearings could result in changes to the Official Plan.

In addition, the Region initiated another Official Plan review process in 2013. The Peel 2041 Regional Official Plan review process is in the early stages but will involve reviewing the current Official Plan to ensure that it meets Provincial Plans and policy statements and achieves the Region's goals and objectives.

A Municipal Comprehensive Review for the Ninth Line Lands is in progress, and a Regional Official Plan Amendment has been submitted to the Ministry of Municipal Affairs and Housing for review. The Ninth Line Lands are described further below. The proposed amendment will be incorporated into a future amendment in conformity with the Region of Peel Official Plan as part of the Peel 2041 Official Plan Review and Municipal Comprehensive Review process. The future amendment will establish a new settlement boundary that includes the Ninth Line Lands and population and employment densities for Ninth Line Lands into the 2041 planning horizon.

In addition, Sections of ROPA (No. 26) related to GTA West Transportation Corridor policies remain appealed and are subject to final decision by the Local Planning Appeal Tribunal. The Official Plan outlines policies regarding the Provincial Freeway Network and identifies the need to support the continuing improvement of the highway network and the integration of freeways with roads in Peel Region and adjacent municipalities for the efficient movement of people and goods. The Plan also acknowledges the importance of continuing to implement the transportation and related infrastructure objectives and policies of the PBWP. A range of policies to achieve the goals of this section of the Plan are outlined. One of these policies is to encourage MTO and the 407 ETR to develop and enhance carpool lots at interchanges along major freeways and highways (Policy 5.9.3.2.8).

The Official Plan outlines policies to support an inter- and intra-regional transit network within the Region of Peel and the Greater Toronto and Hamilton Area (GTHA). Given the projections of residents and workers in the Region of Peel, the current road network will not address future travel demands at an appropriate level of service. To address this concern, the Official Plan recommends the implementation of transit supportive measures and enhancement of transit services. In addition, one of the policies includes to "Support Metrolinx and the area municipalities in: … Support gateways and interconnections between the local bus network and future transitways, especially at Urban Growth Centres and other mobility and transportation hubs" (Policy 5.9.5.2.13).

Employment areas within the Region are key centres of economic activity and will accommodate the forecasted 350,000 new jobs by 2031. The Official Plan contains policies supporting the viability of employment lands, including providing the infrastructure and services required for the development of employment lands to facilitate economic development (Objective 5.6.1.3); and, concentrating higher density employment uses in appropriate locations such as urban growth centres, the Regional Intensification Corridor, mobility hubs, nodes and corridors and in other areas served by transit (Objective 5.6.1.5). The entire study area is located within the Region of Peel 'Urban System' land use designation. Portions of the study area are located within the PBWP area, where the policies of that Provincial Plan apply. Lands north of the existing 407 ETR in the City of Brampton, are within the Toronto Pearson International Airport Operating Area Boundary. The GO Line (Regional Rail – full day) is located across the study area, into the City of Mississauga. There are a number of GO Transit Stations along this route, and a 'Potential Mobility Hub- Gateway' further east of the study area.

City of Mississauga Official Plan

The City of Mississauga Official Plan Office Consolidation includes LPAT decisions and City Council approved Official Plan Amendments as of March 13, 2019. Appeals to the Official Plan are noted in the Office Consolidation. Both the Mississauga Plan (2003) and the Mississauga Official Plan are partially in effect until all the original appeals have been decided. However, given that the Ninth Line Lands are subject to a Municipal Comprehensive Review process in the Region of Peel, the policies of the 2003 Official Plan have not been summarized.The Mississauga Official Plan identifies a number of key guiding principles for land use, including to "provide a range of mobility options (e.g., walking, cycling, transit, vehicular) for people of all ages and abilities by connecting people with places through coordinated land

use, urban design and transportation planning efforts". The Plan includes a range of policies to direct growth to key strategic locations in the City, particularly where existing transit and community infrastructure is present. The Plan encourages complete communities and compact development, with a built form that supports mixed use where residents can work and live in the City. The City is committed to creating a multi-modal transportation network made up of transit, vehicles, active transportation, rail and air travel. The 407 Transitway, which is identified on Schedule 6 (Long Term Transit Network) of the Official Plan. Within the study area, a west-east Bus Rapid Transit Corridor is identified along Highway 403, a Transit Priority Corridor is identified west-east along Derry Road West, and the existing GO commuter rail is located along the railway south of the Highway 401/Highway 407 interchange.

The lands that directly abut the 407 ETR corridor are subject to the policies of the Town of Milton and Region of Halton Official Plans. Policies approved in the Mississauga Official Plan (2019 Consolidation), designate the lands as 'Parkway Belt West', 'Business Employment', 'Public Open Space' and 'Natural Hazard.' The remainder of the study area east of Ninth Line is designated as 'Parkway Belt West', 'Utility', 'Business Employment', 'Office', 'Residential Medium Density', 'Residential Low Density II', 'Motor Vehicle Commercial' 'Greenlands', 'Public Open Space', and 'Mixed Use'. Portions of the study area are identified within the Corporate Centre (CC) and Employment Area City Structure. There are eight (8) Employment Area Character Areas in the City of Mississauga. The Gateway (CC) is located south of Highway 407, along the spine of Hurontario Street, which separates the Gateway West and the Gateway East. The location of these land use designations is presented in Figure 4 and a description of these land use designations is presented in **Table 3.12.**

TABLE 3.12: LAND USE DESIGNATIONS IN THE CITY OF MISSISSAUGA

LAND USE DESIGNATION	PERMITTED USES
All land use designations	The following uses are permitted in all land use designations except Greenlands and Parkway Belt West unless specifically allowed: community infrastructure, community gardening, conservation, electric power distribution and transmission facility, flood control/erosion management, natural gas and oil pipeline, parkland, piped services and related facilities (water, wastewater and stormwater), telecommunications facilities, transit facilities and transportation infrastructure
Office	Permits major office, secondary office and accessory uses. Existing major offices are permitted, and major offices in Major Transit Station Areas. The maximum floor space index (FSI) for secondary offices is 1.0.
Parkway Belt West	These lands are part of the Parkway Belt West Plan area, and this provincial plan should be referred to for land use planning. The Official Plan also indicates that other uses not permitted within these lands include major power generating facilities
Utility	Parking and accessory use is permitted in lands with this designation
Business Employment	Permits a range of businesses, services, entertainment and recreational facilities, and commercial schools. Some of the permitted uses in these lands include commercial parking facilities, transportation facilities, and accessory uses, as well as transit facilities and transportation infrastructure. Motor vehicle body repair facilities are not permitted in lands with this designation
Motor Vehicle Commercial	Permits gas stations, vehicle repairs, service stations and vehicle washing facilities, generally at appropriate intersections
Residential Medium Density	Permits townhouse dwellings and all forms of horizontal multiple dwellings. No apartment dwellings are permitted in horizontal multiple dwellings
Residential Low Density II	Permits detached, semi-detached, and duplex dwellings, as well as other low-rise dwellings with individual frontages
Greenlands	These lands include natural hazards and/or natural areas. Development in these lands is restricted for safety purposes and generally only land uses providing protection, enhancement, and restoration of the Natural Heritage System are permitted. Some uses, such as electric power distribution and transmission facilities, and uses related to wastewater or stormwater and their accessory uses are also permitted
Public Open Space	This is a sub-category under the 'Open Space' land use designation. Permitted uses include agriculture demonstration site, cemetery, conservation, golf course, nursery gardening, recreational facility, stormwater retention and stormwater quality pond, accessory uses
Mixed Use	Permits commercial parking facility, conference centre, entertainment/recreation/sports facility, financial institution, funeral establishments, makerspaces, motor vehicle rentals, motor vehicle sales, overnight accommodation, personal service establishment, post-secondary educational facility, residential, restaurant, retail store and secondary office. Self-storage facilities and detached and semi-detached dwellings are not permitted
Natural Hazards	Lands designated Greenbelt are generally associated with natural hazards and/or natural areas where development is restricted to protect people and property from damage and to provide for the protection, enhancement and restoration of the Natural Heritage System.

Ninth Line Lands

The Ninth Line lands are unique in terms of their history and planning status. The Ninth Line Lands are bounded by Highway 401 (north), Ninth Line (east), Highway 407/Ninth Line crossover (south), and Highway 407 (west), with a total land area of approximately 350 hectares (ha). These lands were transferred from the Region of Halton/Town of Milton to the Region of Peel/City of Mississauga on January 1, 2010 as part of a municipal restructuring process (Mississauga 2015). The planned 407 Transitway adjacent to the Highway 407 corridor will impact the type and scale of development that will occur within this area. Other regional infrastructure surrounding these lands includes Highway 401, Highway 403 and the potential GTA West Transportation Corridor.

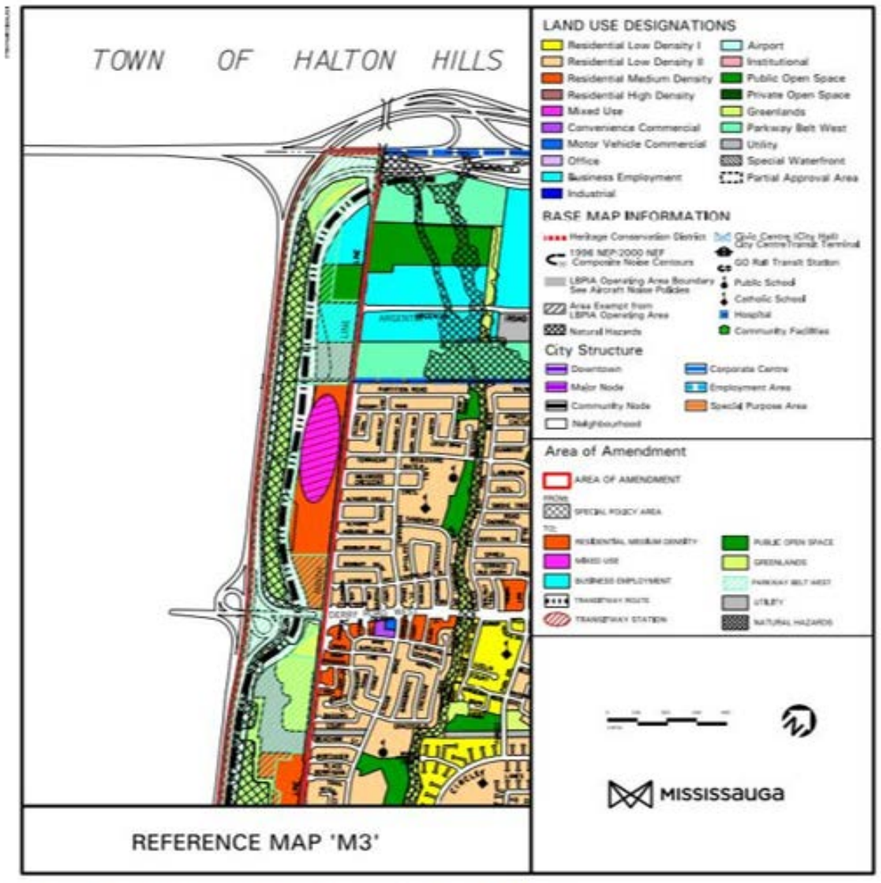
The Region of Peel submitted a Regional Official Plan Amendment (ROPA) to the Ministry of Municipal Affairs and Housing in 2017 for review, to include the Ninth Line Lands in the Regional Urban Boundary and to establish an updated planning framework. The ROPA recommends a land use concept based on the results of the ongoing Municipal Comprehensive Review, including:

- Medium and high-density residential areas, including row houses and apartments;
- Mixed use areas with residential and commercial employment opportunities;
- Higher order transit (407 Transitway);
- An overall minimum density target of 80 persons and jobs per gross hectare;
- A minimum density target of 160 persons and jobs per hectare around transit areas;

- Well located business employment lands in proximity to the 400-series highways; and,
- Protection for natural heritage and flood plain features.

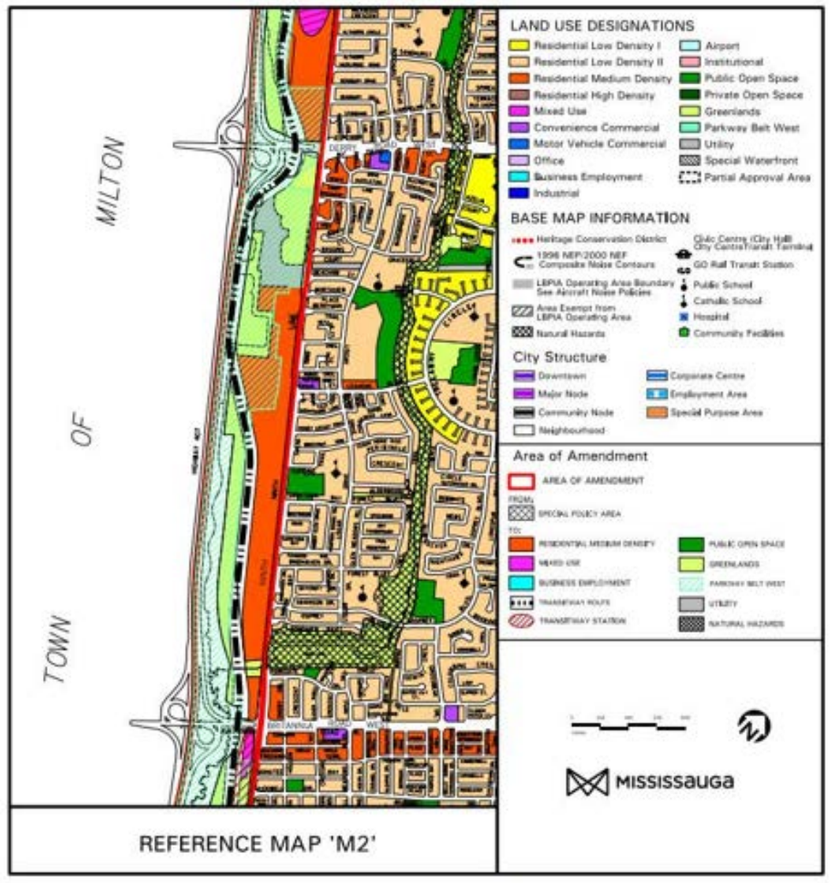
A number of studies have been completed as part of the Municipal Comprehensive Review, including an Archaeology Context Study (AMEC 2014) to assess developable lands; Background Report (MSH 2015); Agricultural Impact Assessment (AMEC Foster Wheeler 2016); Highway 407 Transitway Corridor Assessment (AMEC Foster Wheeler 2016); Water and Wastewater Master Servicing Background Study (AMEC 2017); Subwatershed Study (AMEC Foster Wheeler 2017); Transportation Assessment of Existing Conditions and Emerging Land Use Scenario (MMM Group 2017); Growth Management Analysis (Hemson Consulting 2017); Fiscal Impact Analysis (Hemson Consulting 2017); and MCR Justification Report (MSH 2017). For detailed information regarding these assessments, please refer to these documents under separate cover.

FIGURE 3.7A: EMERGING LAND USE CONCEPT FOR THE NINTH LINE LANDS



Map 16.20-6: Ninth Line Neighbourhood Character Area Reference Map 'M3'

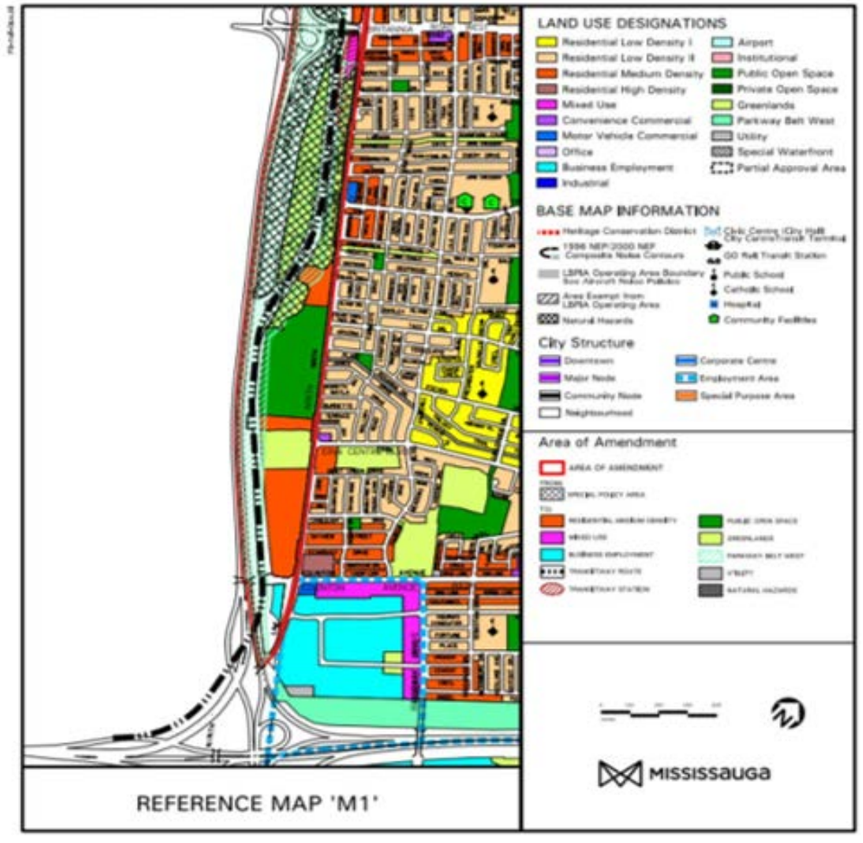
FIGURE 3.7B: EMERGING LAND USE CONCEPT FOR THE NINTH LINE LANDS



Map 16.20-5: Ninth Line Neighbourhood Character Area Reference Map 'M2'

With respect to the planning of the Transitway facility through the Ninth Line Lands, the assessment completed in 2017 identified a Transitway runningway alignment that would stay immediately adjacent to the Highway 407 corridor, where feasible, accommodate the required stormwater conveyance, and accommodate floodplain riparian area storage. Of the total 350 hectares (ha) of land in the Ninth Line Lands, the Transitway design would require 115 ha and a developable land area of 97.2 ha would remain (17.8 ha greater developable land area than the 1998 407 Transitway Corridor Assessment). Transitway stations were recommended at the southwest quadrant of Ninth Line and Britannia Road, and the northwest quadrant of Ninth Line and Derry Road. This study enabled the City of Mississauga and Region of Peel to move forward with the Municipal Comprehensive Review and incorporate the 407 Transitway runningway and stations design into the land use plan.

FIGURE 3.7C: EMERGING LAND USE CONCEPT FOR THE NINTH LINE LANDS



Map 16.20-4: Ninth Line Neighbourhood Character Area Reference Map 'M1'

Development in the Ninth Line Lands should reflect the best practices in planning and urban design. The Shaping Ninth Line Urban Design Guidelines (2017) should be applied during the design, review and approvals process for new development for both public and private projects. The guidelines provide detailed direction for the vision and implementation of the City of Mississauga's Official Plan, Ninth Line Neighborhood Character Area, guiding principles, and related Official Plan policies.

The City of Mississauga Official Plan (2019 Consolidation) states that the Ninth Line Neighbourhood Character Area will be planned to support transit and encourage multi-modal transportation. The urban design policies within the Official Plan state that existing and future residents will have access to a well connected and sustainable natural heritage system, multi-use trails, parks and open spaces, higher order transit, community uses and facilities. The 407 Transitway would run through the area in the north

and south direction. Higher density development will focus around the two Transit Stations located at Britannia Road West and Derry Road West.

Policy Section 16.20.2.6.1 Transportation, states that a significant amount of land in the Ninth Line area is designated Parkway Belt as per the Parkway Belt West Plan. Once the alignment of the 407 Transitway is finalized, lands no longer required for the Transitway may be removed from the Parkway Belt West Plan through amendment to the PBWP. Once the PBWP is amended, the land use designations **(Figure 3.7 a, b and c)** obtained from the City of Mississauga Official Plan, will come into effect.

City of Brampton Official Plan

While the east study limit ends at Hurontario Street (the City of Mississauga/City of Brampton municipal boundary), the land uses within 500 m of the study limits have been included in this land use assessment. The City of Brampton 2006 Official Plan was approved in part by the OMB in 2008. The Official Plan Office Consolidation (November 2013) includes updates to reflect decisions of some appeals to the OMB, conformity to the Places to Grow: Growth Plan for the Greater Golden Horseshoe, and updates to implement Council approved Official Plan Amendments. Some portions of the Official Plan are still under appeal and are noted in the Office (2015) Consolidation.

The City of Brampton identifies the Highway 407 Transitway in its description of the Transit Network. It is identified as a busway that can become a Light Rail Transit corridor in the future. The Transit Network is depicted on Schedule 'C' of the City of Brampton Official Plan. It presents the long-term transit concept for the City. The land use designations within the study area from the City of Brampton Official Plan (Schedule A) are presented in Figure 4 and described in Table 7. The study area is primarily designated as 'Parkway Belt West' and 'Provincial Highways', and the lands north of the 407 ETR are designated as 'Industrial', 'Residential', 'Village Residential', 'Office', and 'Open Space'.

Lands located south of the existing Highway 407, bounded by Mavis Road and Hurontario Street are within the Lester B. Pearson International Airport (LBPIA) Operating Area. For lands exposed to levels between 25 and 30 Noise Exposure Forecast (N.E.F.), the City of Brampton requires a qualified acoustic consultant to undertake a Noise Impact Analysis. In addition, lands north of Highway 407 bounded by Winston Churchill Blvd and Heritage Road are within the Corridor Protection Area and subsequently, within lands appealed to the LPAT. Corridor Protection Areas identify the location and characteristics of a higher-order transit corridor, through the completion of additional transportation studies in order to proceed with specific land use planning approvals.

TABLE 3.13: LAND USE DESIGNATIONS IN THE CITY OF BRAMPTON

LAND USE DESIGNATION	PERMITTED USES
Parkway Belt West	The policies of the Parkway Belt West Plan apply.
Provincial Highways	Includes the provincial highways, including Highway 407, Highway 401, and other associated facilities.
Industrial	Permits light to heavy industrial uses, including manufacturing, processing, repair and service, warehousing and distribution. Also permitted are corporate head offices and high-performance industrial uses. Some ancillary uses are permitted to support the industrial uses; however, non-industrial uses are not permitted as this designation is intended to support economic activity. The City is forecasted to accommodate 70,000 to 90,000 jobs by 2031. This growth is planned to occur on industrial and other employment land designations within the City of Brampton. 'Industrial' lands are located both north and south of Highway 407 (east of Highway 410) within the study area.
Residential	The Residential designations permits predominantly residential land uses including a full range of dwelling types ranging from single detached houses to high-rise apartments. Complementary uses are subject to specific Secondary Plan policies or designations, and may include uses permitted in the Commercial and Institutional and Public Uses designations, such as schools, libraries, parks, community and recreation centres, health centres, day care centres, local retail centre, neighbourhood retail, convenience retail, or highway and service commercial uses. Quasi-institutional uses including social service agencies, union halls, as well as fire halls, police stations and utility installations are permitted. In addition, Places of Worship are permitted in the Residential designations as well.
Village Residential	Includes lands in the villages and hamlets which were part of the original settlement areas of Brampton but are now part of the urban system. In addition to residential uses within village and hamlet settlements, the Village Residential designation permits convenience commercial, community services, crafts, and home workshops/offices which comply with detailed criteria set out in applicable Secondary Plans.
Office	Office development provides a diverse range of employment opportunities. Permitted uses range from small professional offices to large scale headquarters. Major Office, which satisfies a Regional market, will be encouraged to locate within the Central Area and near higher-order transit.
Open Space	The Open Space system represents the structural element which defines the limit for development by prescribing areas to be protected for natural heritage conservation and recreation.

3.2.2. Existing Land Uses

3.2.2.1. Agriculture

City of Burlington

The lands between Dundas Street and Tremaine Road (Burlington-Oakville municipal boundary) contain large blocks of fields that are used for agricultural activities (i.e. cash crops, hayfields, etc). The property just east of Bronte Creek and Appleby Line is the Iron Horse Equestrian Complex, which is accessed from Sideroad 1 north of the study area. The back of this facility is located in proximity to the north side of the 407 ETR.

Town of Oakville

The existing land use of the lands between Tremaine Road and Highway 403 are generally rural and agricultural, with the exception of the valleylands and forests associated with area watercourses. Agricultural activities include cash crops, mixed farming, and equestrian facilities. Farms or agricultural types of facilities located within the study area include: Schellenberg Stables and The Ranch (at Bronte Road), Schulz Farms (Sixth Line), Paladin Ridge Stables, Silver Spring Farm, Cedar Ridge Stables and Trilliumview Stables (west of Neyagawa Boulevard).

Town of Milton

The dominant land use in the Town of Milton is agricultural, as the majority of the lands located on the Town's eastern border with the City of Mississauga and southern border with the Town of Oakville within the study area are used for agricultural operations. Fulsang Nurseries is located on Eighth Line, south of Britannia Road. A number of fields associated with this operation are located within the study area. There are number of large fields throughout the study area, used for cash crops or horticulture operations. Some properties are associated with a residence.

Town of Halton Hills

The dominant land use is agricultural, with a number of farming operations throughout the area. Most of the agricultural operations are cash crop farms and are often residential farms.

City of Mississauga

There are a number of properties within the Ninth Line Lands that are used for agricultural purposes. Some of these properties are associated with a residence and are likely small-scale operations, while others are not associated with a residence and may be farmed as part of a network of other properties. These lands are bordered by urban development to the east and provincial highway to the west.

City of Brampton

An equestrian facility, the Meadowlarke Stables, is located just south of 407 ETR, east of Winston Churchill Boulevard.

3.2.2.2. Residential

Residential communities/neighbourhoods located within the study area are generally set back from the transportation and infrastructure corridor. A few small low density residential areas are located in the study area, which are described below.

City of Burlington

There are residential subdivision communities located north and south of 407 ETR between Brant Street and Dundas Street. The built form is predominantly low density residential, with some residential high rises at Brant Street. Townhouses are located at a few locations throughout the study area and have a higher density than the single dwelling unit subdivisions. Between Dundas Street and Appleby Line there is a large residential community set back from the highway south of the 407 ETR. No residential communities are located between Appleby Line and Tremaine Road.

Town of Oakville

There are no residential subdivisions located within the study area; however, a number of single detached dwellings are located on local roads throughout the study area. Some residences are found in close proximity to the 407 ETR corridor (e.g., Fourth Line).

Town of Milton

The residential land uses in the Town of Milton are primarily rural, comprised of single detached dwellings associated with agricultural lands or manicured lands. Generally, the residences are set back from the 407 ETR right-of-way, with the exception of a few areas of clustered residences, including: Trafalgar Road north of the 407 ETR, East Lower Baseline west of the 407 ETR, Britannia Road west of the 407 ETR, and one residential farm at Derry Road west of the 407 ETR.

Town of Halton Hills

The residential land uses in the Town of Milton are primarily rural, comprised of single detached dwellings associated with agricultural lands or lands severed from agricultural operations. Generally, the residences are set back from the 407 ETR right-of-way, with the exception of the intersection of Steeles Avenue and Ninth Line, Tenth Line just north of the 407 ETR, and Winston Churchill Boulevard just north of 407 ETR.

City of Mississauga

There are a number of single detached residential dwellings located within the Ninth Line Lands. Some of the residences are associated with agricultural operations, while others are not associated with agriculture. Residences are located in close proximity to the 407 ETR at the following locations: East Lower Baseline, near Deepwood Heights, just south of Britannia Road West, and near Argentia Road.

City of Brampton

Residences are located in the study area within the City of Brampton north of Highway 407.

3.2.2.3. Commercial and Industrial

The primary land uses adjacent to the 407 Transitway corridor are commercial and industrial land uses. These lands are employment lands, which provide jobs and economic growth for the region. In addition, the employment lands are focused around major infrastructure (i.e., 407 ETR, Highway 427, Highway 400, hydro transmission lines, and railway corridors), providing convenient transportation access and adequate separation from incompatible land uses.

City of Burlington

There are a number of commercial plazas located in the study area. At Guelph Line, there are two commercial plazas located north of the 407 ETR. These commercial plazas include the following businesses:

Commercial Plaza just west of Coventry Way

- Rexall Pharma Plus
- Nelson Animal Hospital
- Michael's No Frills
- Friend's Convenience

Beacon Hill Plaza just east of Driftwood Drive

- Studio 2501 Hair Salon
- Dental Centre
- Brick Oven Bakery
- Subway

- Dentist Office
- State Farm
- Magicuts
- Nail Salon
- Rock and Roadcycle
- Boston Fish and Chips
- Pets N Groom
- Chiropractor
- Pharmasave

Further east, between Walker's Line and Appleby Line on the south side of the 407 ETR, are a number of commercial/office uses. These include: Neelans Refridgeration Limited, and a number of businesses that are under construction. At Appleby Line, there are a number of commercial plazas south of the interchange with the 407 ETR. A summary of the current businesses using these plazas is described below.

Commercial Plaza west side of Appleby Line

- Family Smiles Dental
- Mostly vacant units

Commercial Plaza east side of Appleby Line

- Lowe's
- Mr. Lube
- Vacant units

Town of Oakville

There are a number of commercial businesses located within the study area, generally on local municipal roads along the highway corridor. The businesses identified include:

- Residential businesses on Burnhamthorpe Road West north of the 407 ETR, east of Tremaine Road (e.g., Club Bekkers Kennels, Lexsan Electrical Inc.);
- Oakville Executive Golf Course;
- Mansewood Inc. (Lawn Irrigation) on Burnhamthorpe Road west of Sixth Line;
- Ren's Pet Depot at Trafalgar Road and Burnhamthorpe Road;
- Silver Sword Armories west of Trafalgar Road on Burnhamthorpe Road;
- Madeiros Boat Works west of Trafalgar Road on Burnhamthorpe Road;
- Vic Hadfield Golf and Learning Centre at Trafalgar Road and Burnhamthorpe Road; and,
- Bark N Fly Doggy Daycare on Burnhamthorpe Road west of Highway 403/Ninth Line.

One industrial business is found within the study area, GE Water and Process Technologies located west of Bronte Road.

Town of Milton

The following commercial businesses are found within the study area:

- Petrie's Quality Topsoil at Sixth Line, north of 407 ETR;
- Longhorn Transportation Services at Trafalgar Road, north of 407 ETR;
- Coivic Contracting Limited on Eighth Line south of Britannia Road;
- DN Campbell Trucking on Auburn Road; and,
- Redwood Pet Resort on Auburn Road.

Two industrial businesses are located within the study area:

- Canadian Broadcasting Corporation Radio Tower Facility located on Auburn Road; and,
- Eco Solutions, located at Trafalgar Road, north of 407 ETR as it produces de-icing, dust control and fertilizer products.

Town of Halton Hills

The following commercial businesses are found within the study area:

- Fishburn Building Science Engineers Ltd. at Steeles Avenue and Ninth Line;
- Peter's Farm Market on Steeles Avenue near Tenth Line;
- Motorcycle Body and Paint on Steeles Avenue near Tenth Line;
- Somal Transport on Tenth Line near Steeles Avenue;
- Halton Homestead Solid Wood Furniture on Steeles Avenue west of Winston Churchill Boulevard;
- Power Trucking on Steeles Avenue west of Winston Churchill Boulevard;
- Clintar Commercial Outdoor Services on Steeles Avenue, west of Winston Churchill Boulevard; and,
- Safe Self Storage on west side of Winston Churchill Boulevard south of Steeles Avenue.

City of Mississauga

The following commercial businesses are found within the study area:

- Maple Hill Tree Services on Ninth Line, north of Britannia Road;
- Sid's Pond and Gardenscape at the northwest quadrant of Ninth Line and Britannia Road;
- Churchill Meadows Animal Hospital on Ninth Line, north of Eglinton Avenue; and,
- A & A Express Heating and J & J Trailer Park (same facility) on Ninth Line, south of Britannia Road.

There are a number of commercial businesses in the communities east of Ninth Line; however, these have not been listed in detail as they are not located within the study area.

City of Brampton

One major employment use is located north of the 407 ETR, the Churchill Business Community, which includes the Amazon Fulfillment Centre and Emblem Logistics located at Steeles Avenue and Winston Churchill Boulevard.

On the south side of the 407 ETR there are three industrial businesses, Nova Tube, Conestoga Cold Storage and Alcon Canada Inc. One business was still under construction beside the Alcon Canada facility.

3.2.2.4. Community and Recreational Facilities

City of Burlington

A number of community facilities are located within the study limits, including:

- Christadelphian Church west of Upper Middle Road;
- St. Paul's Presbyterian Church (current and former church buildings) on Dundas Street; and,
- St. George's Anglican Church west of Appleby Line.

A number of parks and sports facilities are located within the study limits, including:

- Amherst Park, just east of Brant Street;
- Ireland Park and Sports Facilities east of Guelph Line;
- Driftwood Park west of Dundas Street;
- Palladium Park east of Walkers Line; and,
- Doug Wright Park west of Appleby Line.

Additional sports facilities and community facilities are provided by the parks associated with local schools.

Town of Oakville

The following community facilities are located within the study area:

- King's Christian Collegiate at Burnhamthorpe Road and Neyagawa Boulevard;
- Al Falah Islamic Centre at Trafalgar Road;
- Joshua Creek Heritage Art Centre east of Trafalgar Road on Burnhamthorpe Road; and,
- Ontario Zoroastrian Community Foundation east of Trafalgar Road on Burnhamthorpe Road.

One recreational facility, Joshua Creek Tennis is located on Burnhamthorpe Road west of Highway 403/Ninth Line.

Town of Milton

There are no community or recreational facilities within the study area.

Town of Halton Hills

There is one community facility, the St. Stephen's Hornby Anglican Church, on Steeles Avenue west of Ninth Line.

City of Mississauga

There is one community facility, the St. Peter's Mission Church located on Ninth Line, north of Britannia Road.

City of Brampton

There are no community or recreational facilities within the study area.

3.2.2.5. Municipal Services

City of Burlington

Schools located within the study area include:

- Rolling Meadows Public School west of Upper Middle Road;
- St. Timothy Catholic Elementary School east of Guelph Street;
- Notre Dame Catholic Secondary School east of Guelph Street;
- Alton Village Public School east of Walkers Line; and
- St. Anne Catholic Elementary School west of Appleby Line.

The Burlington Fire Station 2 is located on Upper Middle Road south of the 407 ETR.

A hydro corridor crosses the study area just west of Upper Middle Road. The Burlington Hydro facility located at Guelph Line on the south side of the 407 ETR, and the Tremaine Transmission facility is located on Tremaine Road, north of the 407 ETR. A CNR railway crossing is located east of Appleby Line.

A carpool lot is located at the north-west quadrant of the 407 ETR and Appleby Line.

Town of Oakville

The Halton Biosolids Management Centre, a large facility located north of 407 ETR, east of Bronte Road.

One carpool lot is located at the north-west quadrant of the 407 ETR and Bronte Road, and another carpool lot is located at the south-west quadrant of the 407 ETR and Trafalgar Road.

While located outside the study area, the Oakville Trafalgar Memorial Hospital is located in close proximity to the study area on Dundas Street, east of Bronte Road. The closest fire station to the study area is located on Neyagawa Boulevard north of Dundas Street (Fire Station 9). Other fire stations may be constructed to meet the future need of communities in North Oakville. Paramedic services are provided by the Region of Halton at a station on Bronte Road and Highway 403 (much further south of the study area).

Town of Milton

The following regional/municipal service facilities are located within the study area:

- Trafalgar Transformer Station at the northwest quadrant of the interchange of 407 ETR and Highway 403;
- Glenorchy MTS 1, Oakville Hydro Electricity Distribution Inc. at Sixth Line;

- Union Gas Parkway Compressor Station south of Derry Road;
- 407 ETR Patrol Yard at Derry Road; and,
- A carpool lot at the north-west quadrant of the 407 ETR and Trafalgar Road.

The hydro corridor is located along the west side of the 407 ETR from the CPR south to the Trafalgar Transformer Station, and then continues west along the north side of the 407 ETR. While outside the study area, the Expressway Toronto West Terminal is located just west of the study area, south of Highway 401 along the Canadian Pacific Railway. This facility is used to unload trucks onto the trains for transport to other areas.

Fire services are provided by the Town of Milton Fire Station located further west of the study area, at James Snow Parkway South and Derry Road. Paramedic services are provided by the Region of Halton, from a station in the Town of Milton.

City of Mississauga

The following regional/municipal service facilities are located within the study area:

- Union Gas Station on Ninth Line south of Derry Road; and,
- A number of stormwater management facilities.

The closest fire stations are located east of the study area along Derry Road east of Winston Churchill Boulevard (Fire Station 111), Thomas Street at Tenth Line (Fire Station 122), and on Eglinton Avenue at Winston Churchill Boulevard (Fire Station 120). Region of Peel provides paramedic services for the Region, with three reporting stations, 15 satellite stations and 55 ambulances. One satellite station is located at Mississauga Road and Highway 401 (east of the study area). A paramedic station is under construction at Erin Mills Parkway and Thomas Street (east of the study area).

Schools located east of the study area in the City of Mississauga include:

- Sherwood Heights School – Erin Mills Campus at Ninth Line and Eglinton Avenue;
- St. Sebastian Catholic Elementary School south of Eglinton Avenue;
- Artesian Drive Public School south of Eglinton Avenue;
- Oscar Peterson Public School north of Eglinton Avenue;
- Erin Centre Middle School south of Erin Centre Boulevard;
- St. Bernard of Clairvaux School north of Erin Centre Boulevard;
- McKinnon Public School south of Tacc Drive;
- Ruth Thompson Middle School north of Tacc Drive;
- St. Joan of Arc Catholic Secondary School north of Thomas Drive;
- Stephen Lewis Secondary School north of Thomas Drive;
- St. Faustina Elementary School south of McDowell Drive;
- Churchill Meadows Public School south of McDowell Drive;
- Osprey Woods Public School north of Britannia Road;
- St. Edith Stein Elementary School north of Britannia Road;
- St. Simon Stock Elementary School north of Britannia Road;
- Trelawny Public School north of Britannia Road;
- Lisgar Middle School south of Derry Road;
- Our Lady of Mount Carmel Secondary School south of Derry Road;
- Saint Therese of the Child Jesus Elementary School south of Derry Road;
- Saint Albert of Jerusalem Elementary School north of Derry Road; and,
- Kindree Public School north of Derry Road.

Town of Halton Hills/City of Brampton

A hydro corridor crosses Highway 401 just south of the 407 ETR at Winston Churchill Boulevard. It is parallel to the 407 ETR east of Highway 401 and continues in a southwest direction after crossing the highway. A number of stormwater management facilities are located surrounding the 407 ETR and Highway 401. Fire services are provided by stations located outside the study area, at Steeles Avenue and Mississauga Road (Brampton Fire Station 212) and at 10th Side Road and Eighth Line (Halton Hills Headquarters Fire Station). Paramedic Services are provided by the Region of Halton for the Town of Halton Hills at 11 stations throughout the Region. Paramedic services are provided by the Region of Peel for the City of Brampton. The closest paramedic station is located at Steeles Avenue and Mississauga Road (Peel Paramedics Station).

3.2.2.6. Mining and Aggregates

City of Burlington

There are two quarries located within the study area. One is located on the north side and one is located on the south side of the 407 ETR, along the CNR east of Appleby Line. These include:

- Burlington Quarry, Forterra Brick Ltd., Class A Licence, 17.1 ha, maximum tonnage: 195,000; and,
- Tansley Quarry, Forterra Brick Ltd., Class A Licence, 37.8 ha, maximum tonnage: 300,000.

There are no pits or quarries located within the remainder of the study area.

3.2.2.7. Soils

Canada Land Inventory (CLI) classifications of capability for agricultural assessment were assessed for relevance and utility in identifying potential agricultural impacts in the 407 Transitway study area. As determined by soil surveys, the CLI indicates the classes and subclasses according to the Soil Capability

Classification of Agriculture. Based on the potential of each soil to produce field crops, soils are grouped into seven (7) classes and thirteen (13) subclasses. The classes indicate the degree of limitation imposed by the soil in its use for mechanized agriculture. The subclasses indicate the kinds of limitations that individually or in combination with others, are affecting agricultural land use. **Table 3.14** lists each class number along with its associated description. Organic soils are not a part of the classification system and are identified as Class 0.

TABLE 3.14: LAND CAPABILITY AND SOIL CLASS

CLASSES	DESCRIPTION
Class 1	Soils in this class have no significant limitations in use for crops
Class 2	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices
Class 3	Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices
Class 4	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices
Class 5	Soils in this class gave very severe limitations that restrict their capability in producing perennial forage crops, and improvement practices are feasible
Class 6	Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible
Class 7	Soils in this class have no capacity for arable culture or permanent pasture
Class 0	Organic Soils (not placed in capability classes)

In general, soil classifications throughout the transitway corridor are predominantly a mosaic of Class 1 and Class 3 pockets. There are pockets of Class 5 soils documented between Dundas Street and Trafalgar Road, and between Creditview Road and Hurontario street. Unlike the rest of the corridor, the area between Heritage Road and Creditview Road, Class 0 soils are documented.

Soils surrounding the 407 ETR in the study area are classified as Chinguacousy Clay Loam, Jeddo Clay Loam, Oneida Loam, Tuscola Silt Loam and Bottom Lands. The dominant soil throughout the study corridor is Chinguacousy Clay Loam broken up by bottom lands associated with area watercourses, a series of pockets of Jeddo Clay Loam, Oneida Loam, Tuscola Silt Loam. The soils are further described in detail below.

Chinguacousy Clay Loam

Chinguacousy clay loam soils are imperfectly drained and exhibit a smooth, gently sloping topography. This soil type developed on clay till derived dominantly from shale and, to a lesser extent, from limestone materials. Erosion with this type of soil is slight. Chinguacousy clay loam soils are slightly acidic to neutral and contain few stones (Hoffman and Richards 1953).

Jeddo Clay Loam

Jeddo soils are the poorly drained member of the Oneida catena (Gillespie and Wicklund 1971). These soils are found below the escarpment in Burlington and Oakville, occupying depressional areas in associated with Oneida and Chinguacousy soils (Gillespie and Wicklund 1971). Jeddo soils are mainly found in narrow, shallow drainage basins or in the depressional areas associated with undulating or rolling topography (Gillespie and Wicklund 1971).

Oneida Loam

Oneida soils are the moderately well-drained member of the Oneida catena and generally occur in association with the imperfectly drained Chinguacousy and poorly drained Jeddo soils (Gillespie and Wicklund 1971). The landscapes associated with the Oneida soils vary from immediately below the escarpment having slopes up to 10%, to the smooth plain in Oakville having slopes generally less than 7% (Gillespie and Wicklund 1971).

Tuscola Silt Loam

Tuscola soils are derived from fine sandy loam or silt loam lacustrine materials and are imperfectly drained. The topography is gently sloping, permitting a moderate amount of surface runoff (Gillespie and Wicklund 1971).

Bottom Lands

Bottom lands consist of the low-lying soils along watercourses that are subject to flooding. Drainage varies in these areas but is generally poor (Hoffman and Richards 1953). All watercourses located within the study area are classified as bottom lands.

3.2.3. Future Land Uses

This section presents proposed future land uses within the study area that may interact with the 407 Transitway.

City of Burlington

The 407 Transitway is identified as a Higher Order Transit Corridor in the Region of Halton Official Plan. There are several other key areas that are planned for future transit and associated land use development. The Region of Halton Official Plan identifies a Mobility Hub at the west end of the Transitway study area near Brant Street and Plains Road East along the CNR. Further south on Brant Street, at Lakeshore Road is another Mobility Hub and Urban Growth Centre. The 407 Transitway will offer opportunities to connect to these planned Mobility Hubs to assist in making a connected and accessible transit system.

Higher Order Transit Corridors are also identified on Brant Street, Dundas Street, Appleby Line, Regional Road 25, and Trafalgar Road. A project is currently underway to plan and implement a Bus Rapid Transit

(BRT) Corridor on Dundas Street (Regional Road 5) between Brant Street and Trafalgar Road. This project and other future transit projects may connect to the planned 407 Transitway.

There are several active developments that may potentially be impacted by the proposed Transitway. These have thus been considered within the study scope. The lands at 4721 Palladium Way are subject to a recently approved Zoning By-Law Amendment, served to permit the development of a place of worship and accessary uses on the subject lands. Additionally, privately owned lands located at 4853 Palladium Way are subject to a Draft Plan of Subdivision to create a public road and employment blocks, planned to be developed for employment uses. In 2017, the Draft Plan of Subdivision was approved by the City of Burlington.

Within the City of Burlington, the Evergreen Community comprises approximately 67 hectares (ha) on the southwest corner of Tremaine Road and Highway 407. The Evergreen Community has been subject to a multi-year planning and municipal approvals process seeking to permit a mixed-use community containing residential, employment and mixed uses. The initial application for redevelopment was submitted in 2007. Since then, the development proposal for the Evergreen Community has advanced alongside the Tremaine Dundas Secondary Plan study. The 67 hectares (ha) of land encompass most of the developable lands within the Tremaine Dundas Secondary Plan area. The Secondary Plan received Council approval in 2018 and is now pending Regional approval.

There are various active development applications on lands located south of Highway 407 at the southwest corner of Appleby Line. The City of Burlington granted approval for one of the subject lands for a Draft Plan of Subdivision to create ten lots on an internal road.

Town of Oakville

The Region of Halton identifies Higher Order Transit Corridors along Dundas Street, Regional Road 25, and Trafalgar Road. There is a Mobility Hub and Urban Growth Centre planned at Trafalgar Road and the VIA/GO Rail Line south of the study area. Transit along Trafalgar Road would connect the planned Mobility Hub and Urban Growth Centre with the 407 Transitway.

The North Oakville Secondary Plans outline the future land use pattern for much of the study area through the Town of Oakville. The land use pattern is compatible with the future 407 Transitway. Two north-south busway corridors are planned on Regional Road 25 and Trafalgar Road. Trafalgar Road is also identified as a Primary Transit Corridor Service. Transit Terminals are planned at Regional Road 25, Neyagawa Boulevard and Trafalgar Road. The lands south of the 407 Transitway at Trafalgar Road are designated as 'Trafalgar Road Urban Core Area' and will encourage higher density land uses to support transit and meet the policies and requirements of the Growth Plan and the Oakville Official Plan.

The four active developments located within the 407 Transitway Study Area are presented below:

Part of lots 14 and 15 on Concession 2, north of Dundas Street, are subject to a Zoning By-law Amendment and Plan of Subdivision for 226 dwelling units in single detached and townhouse buildings, and approximately 34 hectares (ha) of Employment Lands supported by a village square and a stormwater management facility. Planning approvals from the OMB were granted in 2017. Currently, matters relating to stormwater management from the development lands draining north towards the 407 Transitway corridor are under investigation in an engineering review. MTO staff and the 407 Transitway Drainage Engineer believe that the site design issues in relation to the Transitway corridor are manageable.

Lands located on 3269 and 3271 Dundas Street West are undergoing rezoning and Draft Plan of Subdivision submission for 75.13 hectares (ha). It is anticipated that the applications will proceed to the Oakville Planning and Development Council for Draft Plan Approval in 2019.

Part of Lot 20, Concession 2, north of Dundas Street, Parts 1 and 2 on Neyagawa Boulevard and Burnhamthorpe Road proposed an Official Plan Amendment to the North Oakville East Secondary Plan. Prior to the province completing an Environmental Assessment and detailed design of the 407 Transitway, the proponent requested to revise *Figure 4* of the Transportation Plan and relocate the transit station symbol to the northern portion of the subject lands, to develop the southern portion of the subject lands. This application was refused on the basis that it would allow for premature land division in the absence of knowing what could potentially impact the planned 407 Transitway.

Additionally, The North Oakville West Lands at Bronte Road, also known as the Newmark Lands, have been under appeal for many years regarding land conversions of 'Employment Lands.' Consideration to all these active and inactive developments are expected to occur through the region's ongoing Municipal Comprehensive Review and the Town of Oakville's Official Plan review.

Town of Milton

The Region of Halton identifies a north-south Higher Order Transit Corridor along Trafalgar Road. This corridor would connect the Town of Oakville in the south to the Proposed Major Transit Station at Trafalgar Road and the CPR Line north of Derry Road. The CPR Line is a Commuter Rail Corridor that transports commuters between Milton and Toronto. In addition, there are new areas in the Town of Milton that have been identified for urban expansion between 2021 and 2031. These lands are outside the study area, located west of Eighth Line. However, it indicates that population growth is forecast for the local area, which will change land use patterns and increase demand for transit and transportation infrastructure.

Town of Halton Hills

The Premier Gateway Employment Area planned along the north side of Highway 401 and its interchange with the 407 ETR are intended to attract employment uses as this area has good visibility and access along provincial highways. The Official Plan policies identify implementation of the employment land Phase 2A and 2B for 2021 to 2031.

In addition, this area of the Town of Halton Hills and City of Brampton have been identified as part of the study area for the HPBATS/GTA West Corridor Protection Area. The planning study for this initiative is not complete, so potential connections to this future transportation system are currently unknown.

City of Mississauga

The co-ordinated planning between the 407 Transitway and the land uses abutting the protected corridor in the City of Mississauga will ensure compatibility of the Transitway with future land uses.

The City of Mississauga will continue to ensure compatibility of the 407 Transitway with future land uses. New development in the Ninth Line Neighbourhood, including the organization and design of blocks, streets, and boulevards, will support and encourage transit and active transportation. The anticipated growth in the Ninth Line Neighborhood will support ridership for the future 407 Transitway. The Ninth Line Neighbourhood Character Area will accommodate a variety of medium and high-density housing, employment uses, and an extensive open space network.

The Region of Peel has identified a number of Rapid Transit Corridors (Schedule G, Region of Peel Official Plan). The existing GO Line/CPR Line that crosses in a west-east direction north of Derry Road is identified within the study area. No new stations are planned for the study area, but there is a Potential Mobility Hub – Gateway further east. In addition, Mississauga Transitway has implemented a dedicated bus corridor located parallel to Highway 403 and connects 407 ETR/Highway 403 in the west with Highway 427/TTC on Eglinton Avenue in the east.

Within the 407 Transitway study area, there is one (1) outstanding development application for lands located on the Northwest corner of Hurontario Street and Vicksburgh Drive that is subject to a Site Plan Approval to permit a six (6) storey office building. The status of the application has been withheld.

City of Brampton

The City of Brampton has identified a Major Transit Station Area at Steeles Avenue West and Mississauga Road. While this is located outside the study area, it is a planned transit hub that could offer a connection point to future users of the 407 Transitway. The Major Transit Station is planned as an area for high order transit, and will be the focus of intensification for employment, residential, civic, cultural and recreational uses. The Region of Peel Official Plan (Schedule G) identifies 'Other Potential Rapid Transit Corridors' that will connect communities in north Brampton with the Major Transit Station described above.

Within the 407 Transitway study area, a number of development applications within the City of Brampton have been approved. Lands located south of the ETR, on the northeast corner of Winston Churchill Boulevard, were granted approval to amend the Parkway Belt West by Ministry of Municipal Affairs and Housing to permit a proposed parking lot, which is currently being processed by the Province of Ontario.

The lands located north and south of the 407 ETR, bounded by Mississauga Road to the west and Creditview Road to the east, have been approved to amend the Official Plan to implement the Community Block Plan, Area 40-2 of the Bram West Secondary Plan.

Lands north of the 407 ETR, bounded by Creditview Road to the east and Financial Drive to the west, received approval for a zoning by-law amendment to permit small lot adjustments for a Draft Approved Plan for Subdivision (Residential potion) on lands located on the east side of Financial Drive.

Lands located north of the 407 ETR, on Hallstone Road and west of Financial drive (Part of Lot 13, Concession 4), have been approved to rezone the subject lands to permit prestige industrial and office uses. The status of the application is within the appeal period.

Within the 407 Transitway study area, a class environmental assessment was completed for a new north-south arterial road, Bram West Parkway, from Heritage Road to Financial Drive and the extension of Financial Drive from Heritage Road to Winston Churchill Boulevard. The project includes a new arterial road, Bram West Parkway, from Financial Drive to the 407 ETR, with a new partial interchange, turn lanes at appropriate intersections, a sidewalk on the west wide and multi-use path on the east side.

3.2.4. Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment report (June 2020) was undertaken by ASI to identify known and potential built heritage resources and cultural heritage landscapes within or adjacent to the study area. The study included background historical research and a review of secondary source material, including historical mapping and revealed a study area with a rural land use history dating to the early nineteenth century. Based on the results of the background research and field review, thirty-one built heritage resources and cultural heritage landscapes were identified within and/or adjacent to the overall 407 Transitway – West of Brant Street to West of Hurontario Street study area, and summarized in **Table 3.15.**

Cultural Heritage Evaluation Reports were recommended for the 12 properties (CHR 8, 11, 13, 14, 19, 20, 21, 22, 24, 29, 30, 31) that could be directly impacted. All CHERs were undertaken in March – June 2020. Heritage Impact Assessments (HIAs) were prepared for seven properties (CHR 13, 22, 23, 24, 29, 30, 31). All CHERs and HIAs were undertaken in March – July 2020. The Cultural Heritage Report-Existing Conditions and Preliminary Impacts Assessment, CHERs and HIAs are included in **Appendix G**.

A cultural heritage landscape (CHL) is perceived as a collection of individual built heritage resources and other related features that together form farm complexes, roadscapes, and nucleated settlements. Built heritage reasource (BHRs) are typically individual buildings or structures that may be asssociated with a variety of human activities, such as historical settlement and/or patterns of architectural development.

TABLE 3.15: SUMMARY OF KNOWN AND POTENTIAL BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES WITHIN/ADJACENT TO THE STUDY AREA

FEATURE	TYPE OF RESOURCE	LOCATION/ ADDRESS	PROPERTY TYPE	RECOGNITION
CHR 1	CHL	7420 Ninth Line, Mississauga	Remnant farmscape	Designated, Part IV (By-law 74-96)
CHR 2	CHL	7564 Tenth Line West, Mississauga.	Farmscape	Designated, Part IV (By-law 857-79)
CHR 3	CHL	3451 Tremaine Road, Oakville.	Farmscape	Listed by the Town of Oakville
CHR 4	CHL	2483 Burnhamthorpe Road West, Oakville.	Farmscape	Listed by the Town of Oakville
CHR 5	CHL	2381 Burnhamthorpe Road West, Oakville.	Residence	Listed by the Town of Oakville
CHR 6	CHL	2401 Burnhamthorpe Road West, Oakville.	Farmscape	Listed by the Town of Oakville
CHR 7	BHR	1495 Burnhamthorpe Road West, Oakville.	Residence	Listed by the Town of Oakville
CHR 8	BHR	4119 Fourth Line, Oakville.	Residence	Listed by the Town of Oakville
CHR 9	BHR	Glenorchy Bridge, Fourth Line, Oakville	Bridge	Listed by the Town of Oakville
CHR 10	CHL	4022 Fourth Line, Oakville.	Farmscape	Listed by the Town of Oakville
CHR 11	CHL	263 Burnhamthorpe Road West, Oakville.	Remnant farmscape	Listed by the Town of Oakville
CHR 12	CHL	185 Burnhamthorpe Road West, Oakville.	Farmscape	Designated Part IV, (By-law 1992-237)
CHR 13	CHL	4243 Sixth Line, Oakville.	Farmscape	Listed by the Town of Oakville
CHR 14	CHL	4233 Trafalgar Road, Oakville.	Farmscape	Listed by the Town of Oakville
CHR 15	BHR	906 Brant Street, Burlington.	Former residence	Listed by the City of Burlington
CHR 16	CHL	2168 Guelph Line, Burlington.	Museum	Designated, Part IV of the OHA (By-law 9-1978)
CHR 17	BHR	3015 Dundas Street, Burlington.	Residence	Listed by the City of Burlington
CHR 18	CHL	3318 Dundas Street, Burlington.	Church and Cemetery	Designated, Part IV of the OHA (By-law 501-06)
CHR 19	CHL	7044 Ninth Line, Mississauga.	Remnant farmscape	Listed by the City of Mississauga
CHR 20	CHL	5768 Ninth Line, Mississauga.	Farmscape	Listed by the City of Mississauga
CHR 21	CHL	2800 Meadowpine Boulevard, Mississauga.	Stable	Identified during field review
CHR 22	CHL	7696 Heritage Road, Brampton.	Farmscape	Listed by the City of Brampton
CHR 23	CHL	Churchville Heritage Conservation District.	Heritage Conservation District	Designated, Part V (By-law 219-90, 221-2002 (A))
CHR 24	CHL	6056 Ninth Line, Mississauga.	Church and Cemetery	Listed by the City of Mississauga
CHR 29	CHL	5104 Ninth Line, Mississauga.	Farmscape	Listed by the City of Mississauga
CHR 30	CHL	3269-3271 Dundas Street West, Oakville.	Farmscape	Listed by the City of Oakville
CHR 31	CHL	0 Heritage Road, Brampton.	Former residence	Identified during field review

3.2.5. Archaeological Resources

A Stage 1 Archaeological Assessment was undertaken for this TPAP. A Stage 1 Archaeological Assessment consists of a review of geographic, land use and historical information for the property and the relevant surrounding area, a property visit to inspect its current condition and contacting the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) to find out whether, or not, there are any known archaeological sites on or near the property. Its purpose is to identify areas of archaeological potential and further archaeological assessment (e.g. Stage 2-4) as necessary. The results of the Stage 1 archeological assessment are graphically presented in the maps in Figures 18 to 36 of **Appendix O** of this EPR. The report was entered into the Ontario Public Register of Archaeological Reports on April 24, 2020.

The Stage 1 Archaeological Assessment made the following recommendations:

1. The Study Area within the Final Preferred Design exhibits archaeological potential. These lands require Stage 2 Archaeological Assessment by test pit/pedestrian survey at five metre intervals, where appropriate, prior to any construction activities;
2. Parts of the Additional Assessed Areas exhibit archaeological potential, and will require Stage 2 survey, if impacted, prior to any proposed development;
3. AiGw-97, AiGw-165, AjGw-32, AjGw-33, and AjGw-43 are within the Study Area and are considered to retain further CHVI. The sites are recommended for Stage 2 survey to relocate them, due to the passage of time and paucity of mapping from when they were first identified;
4. Parts of the Final Preferred Design and Additional Assessed Areas have been previously assessed and determined not to be cleared of further archaeological concern;
5. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance, low and wet conditions, or slopes in excess of 20 degrees. These lands do not require further archaeological assessment; and

6. Should the proposed work extend beyond the current Study Area, further Stage 1 Archaeological Assessment should be conducted to determine the archaeological potential of the surrounding lands.

As part of the TPAP, a Stage 2 Archaeological Assessment, including test pit and pedestrian surveys, was conducted by ASI on lands retaining archaeological potential that may be disturbed by the proposed Transitway construction lying within 300 m of watercourses/waterbodies (where permission to enter was secured) to identify any sites/lands requiring further assessment. Please see Chapter 6 of this EPR for the results of Stage 2 Archaeological Assessment. All remaining Stage 2 Archaeological Assessment and any required Stage 3 and Stage 4 archaeological assessment work will be completed as early as possible, and prior to the completion of Detail Design.

3.2.6. Noise and Vibration

Transportation projects in high density areas have the potential to impact the existing sound environment, and also introduce a potential source of vibration particularly when rail infrastructure is proposed. The following section addresses land uses within the study area with a focus on the features that are in the vicinity of the 407 Transitway and are likely to be impacted by noise from the proposed 407 Transitway.

PREDOMINANT NOISE SOURCES

In the first segment of the study area, eastward from west of Brant Street to shortly east of Dundas Street, road traffic is the major contributor of noise as several heavily travelled roadways such as Brant Street, Guelph Line, Dundas Street intersect the 407 ETR right-of-way (407 ROW). Land uses include residential subdivisions from Brant Street to Dundas Street on both sides of 407 ETR. A busy commercial plaza adjacent to Brant Street is a significant contributor of noise in the immediate vicinity from sources such as rooftop ventilation, on-site road traffic and loading/unloading operations. Lands immediately north of Dundas Street are vacant undeveloped lands. Overall, this area can be considered as having a moderate to high ambient noise environment.

Moving east of Dundas Street, there are residential subdivisions within 250 m to 300 m south of 407 ETR bound by Walkers Line and Appleby Line, as well as a large commercial plaza on both sides of Appleby Line. Road traffic along Appleby Line and Walkers Line is the major contributor of noise within this area. Commercial noise is a minor contributor affecting the eastern portion of this subdivision. This area can be considered as having a moderate to high ambient noise environment.

The area east of Appleby Line to Ninth Line Road/Highway 403 is predominantly comprised of vacant undeveloped lands and agricultural lands with associated residential dwellings. There are no large residential subdivisions within this segment of the study area, however, there are some single-family residential dwellings in close proximity to 407 ETR on both sides. A few minor industrial and commercial sites are present; however, road traffic is still the predominant noise source. Bronte Road, Neyagawa Boulevard, Trafalgar Road are the major contributors to road traffic noise within this segment of the study area. Some rail traffic is present immediately east of Appleby Line as the rail line crosses 407 ETR. Also present are intermittent airplane activities as part of Lester B. Pearson International Airport (LBPIA) arrivals and departures, which are outside the scope of this assessment. Overall, this area can be considered to have a moderate ambient noise environment.

At the interchange of Highway 403- and Ninth-Line Road, the study area moves northwest until its intersection with Highway 401, where it turns east. The study area runs east from there until its ends at west of Hurontario Street. Within this segment of the study area, there is a large residential subdivision located immediately east of 407 ETR. Road traffic along Ninth Line, Eglinton Avenue West, Britannia Road West, Derry Road West and Highway 401, is the major noise contributor within this segment. The lands west of 407 ETR are a mix of vacant undeveloped lands, agricultural lands, and scattered single dwelling residences. The Hydro One Trafalgar Transformer Station and the Union Gas Parkway Compressor Station are the major industrial facilities within this segment in the study area. Both facilities are currently operating under an Environmental Compliance Approvals and are in compliance with NPC-300. Their noise impacts can be considered minor compared to the road traffic within the area. The Milton GO line is located at the north end of the residential subdivision east of Ninth Line and intersects the study area just south of Highway 401. Rail traffic noise impacts a small area on the north end of the residential subdivision within this segment of the study area. Overall, this area can be considered to have a moderate to high ambient noise environment.

The Noise and Vibration Impact Assessment Report is presented in **Appendix J** of this EPR.

3.3. Transportation

The following provides an overview of the road and transit-based elements of the existing transportation system within the 407 ETR Corridor.

3.3.1. Existing Road Network

407 ETR is the east-west spine highway that defines the 407 Transitway Corridor. From Brant Street to Ninth Line at Highway 407/403 interchange, the Corridor falls under the Regional Municipality of Halton jurisdiction. From Ninth Line at Highway 407/403 interchange to Hurontario Street the Corridor falls under the Regional Municipality of Peel.

A grid network of arterial roads connects 407 ETR to adjacent land uses. In the study area, there are some widening plans approved for the exsiting arterial roads. The construction schedule and impacts of these plans on the design of 407 Transitway to be confirmed. The major transportation corridors within the study area include:

Dundas Street – A six-lane east to west arterial road. It is connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR. The road connects Toronto to Mississauga, Oakville and Burlington.

Appleby Line – A north to south arterial road with varying number of lanes in a range from two to six, connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR.

Bronte Road – A north to south four-lane arterial road connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR. This road is also called as Regional Road 25.

Neyagawa Blvd – A north to south four-lane arterial road connected to 407 ETR through a partial tight diamond interchange crossing under 407 ETR.

Trafalgar Road – A north to south four-lane arterial road connected to 407 ETR through a partial cloverleaf interchange crossing under 407 ETR.

Highway 403 – A 400-series provincial highway travelling from west of Hamilton to Mississauga. Highway 403 has a north/south orientation where it connects to 407 ETR through a directional interchange.

Ninth Line Road – A north to south two-lane arterial road which travels parallel to 407 ETR from Highway 403/407 interchange to Highway 401/407 interchange with no direct connection to 407 ETR.

Britannia Road – An east to west arterial road with varying number of lanes in a range from two to four, connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR.

Derry Road – An east to west four-lane arterial road connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR.

Highway 401 – A 400-series west/east Provincial highway connected to 407 ETR through a directional interchange. It travels from Windsor in the west of Ontario to the Ontario–Quebec border in the east.

Winston Churchill Boulevard – A north to south arterial road with varying number of lanes in a range from four to six. Winston Churchil Boulevard is a long road which begins at Lakeshore Road in the south at the boundaries of the City of Mississauga and the Town of Oakville, and ends in Caledon. It crosses over 407 ETR with no connection. It connects to Highway 401 through a partial cloverleaf interchange in vicinity of the 407 ETR crossing.

Mississauga Road – A north to south six-lane arterial road connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR.

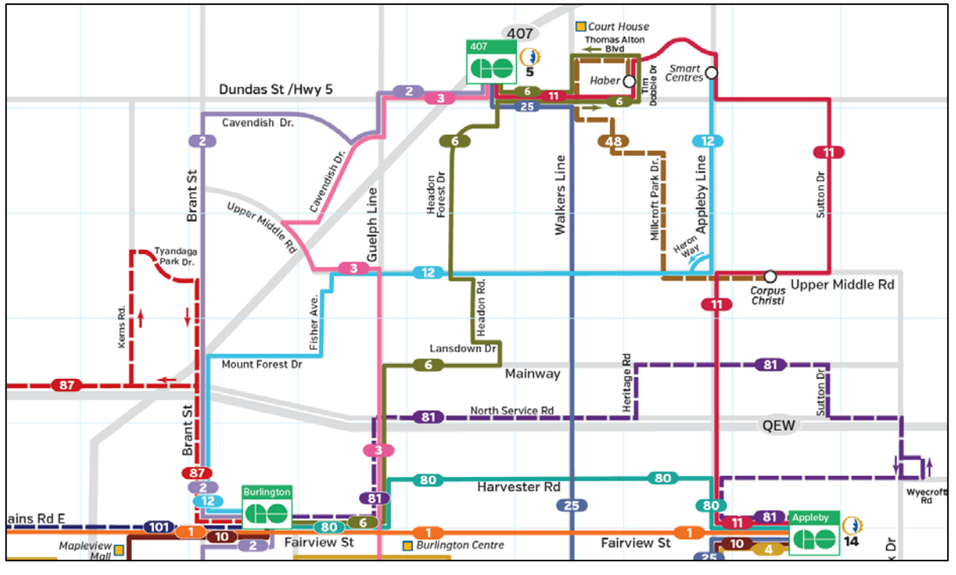
Mavis Road – A north to south arterial road with varying number of lanes in a range from four to six, connected to 407 ETR through a partial cloverleaf interchange crossing over 407 ETR.

3.3.2. Transit Services within the Study Area

The six transit agencies in the study area including GO Transit, Burlington Transit, Oakville Transit, Milton Transit, Brampton Transit and Mississauga's MiWay Transit are currently providing transit services in the 407 ETR Corridor and adjacent areas. The regular/local transit services connect to rapid transit services such as GO Train, GO Bus, MiExpress and Züm services as well as major activity centers including employment and commercial centers and post-secondary schools in the GTA.

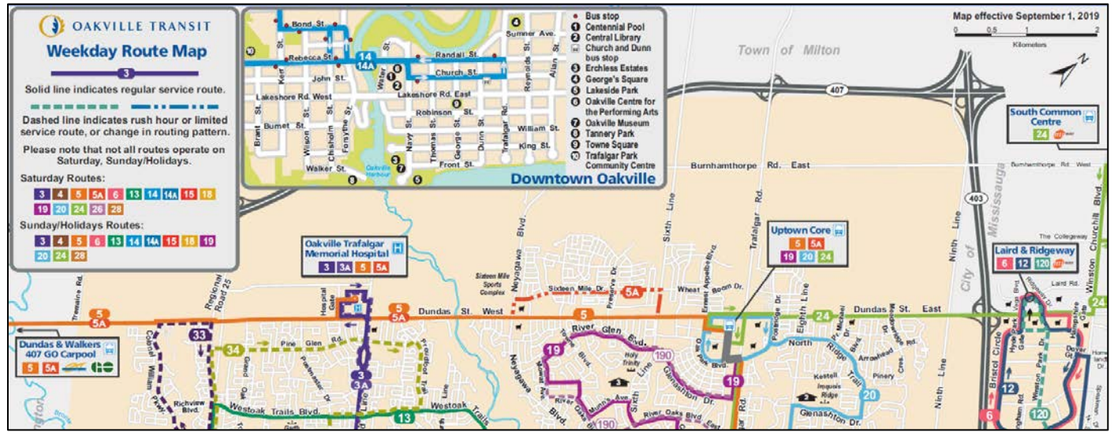
The existing transit services are illustrated in **Figures 3.8** to **3.12**.

FIGURE 3.8: EXISTING BURLINGTON TRANSIT SERVICE MAP IN 407 TRANSITWAY AREA



Source: Burlington Transit System Map (September 2019)

FIGURE 3.9: EXISTING OAKVILLE TRANSIT SERVICE MAP IN 407 TRANSITWAY AREA

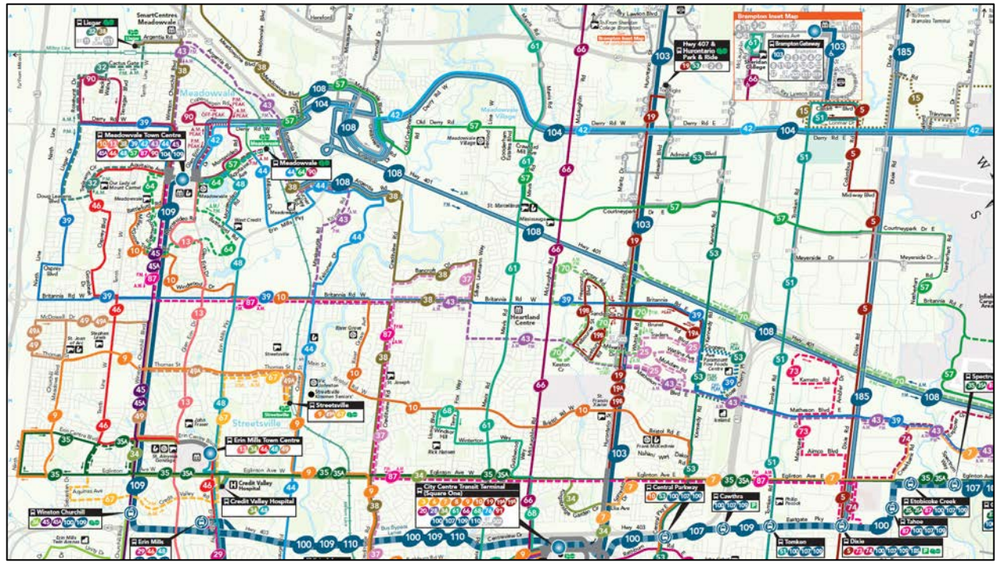


Source: Oakville Transit System Map (September 2019)

FIGURE 3.10: EXISTING BRAMPTON TRANSIT SERVICE MAP IN 407 TRANSITWAY AREA

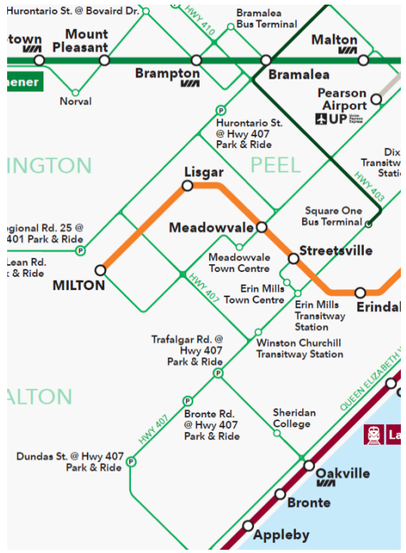
Source: Brampton Transit System Map (September 2019)

FIGURE 3.11: EXISTING MISSISSAUGA'S MIWAY SERVICE MAP IN 407 TRANSITWAY AREA



Source: Mississauga's Miway System Map (September 2019)

FIGURE 3.12: EXISTING GO TRANSIT SERVICE MAP IN 407 TRANSITWAY AREA



Source: GO Transit System Map (September 2019)

3.3.3. Burlington Transit

Burlington Transit operates local bus routes near the south end of Highway 407 ETR Corridor. Five (5) main bus terminals and major commercial and employment centres in Burlington and also Hamilton GO Station outside of Burlington are connected to a network of fourteen (14) regular and express bus routes. Among the main bus terminals within the City of Burlington, Burlington GO Station and 407 GO Carpool Lot are in the vicinity of 407 Transitway project. Particularly, 407 GO Carpool Lot is adjacent to the station site of Dundas Street located for the 407 Tranistway project. This terminal is also a transfer point between Burlington Transit and Oakville Transit services. A full list of Burlington Transit's bus routes crossing or or potentially having access to 407 Transitway stations in the study area are shown in **Table 3.17**.

TABLE 3.16: EXISTING BURLINGTON TRANSIT'S BUS ROUTES

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
2 Brant North	Downtown Terminal	407 GO Carpool Lot
3 Guelph – Downtown	Downtown Terminal	407 GO Carpool Lot
6 Headon	Burlington GO Station	407 GO Carpool Lot
11 Sutton – Alton	Appleby GO Station	407 GO Carpool Lot
25 Walkers	Appleby GO Station	407 GO Carpool Lot
87 Tyandaga North Service	Aldershot GO Station	Burlington GO Station

3.3.4. Oakville Transit

Oakville Transit operates local bus routes on the south side of Highway 407 ETR Corridor between Tremaine Road (aligned with Burloak Drive) and Highway 407/403 interchange. Four main bus terminals and major commercial and employment centres in Oakville and also three (3) major bus terminals in Burlington (Applyby GO Station and 407/GO Carpool Lot) and Mississauga (Clarkson GO Station and South Common Centre) are connected to a network of twenty one (21) regular and express bus routes. None of the main bus terminals within the Town of Oakville is in the vicinity of 407 Transitway project. Oakville Transit Route 5/5A which operates from Oakville GO to 407 GO Carpool Lot and vice versa through Dundas Street can be considered as a feeding bus line for 407 Transitway in the study area. Based on Oakville Transit System Map, there is no public transit coverage in the rural area between Dundas Street and Highway 407 ETR.

3.3.5. Milton Transit

Milton Transit operates ten (10) local bus routes across the urban areas of Milton east of Tremaine Road and north of Britannia Road where all the bus routes depart/arrive or transfer at Milton GO Station. Based on Milton Transit System Map, there is no public transit coverage in the rural area adjacent to Highway 407 ETR along the area of the Town of Milton.

3.3.6. Brampton Transit

Brampton Transit operates local, express and Züm Bus Rapid Transit routes near and perpendicular to Highway 407 ETR Corridor in the study area between Highway 401/407 ETR interchange and west of Hurontario Street. Brampton Transit operates fifty-six (56) routes including five (5) Bus Rapid Transit (BRT) routes by using clean hybrid diesel-electric buses, four (4) express routes to the Airport, etc. and forty-seven (47) local bus routes. Six (6) main bus terminals and facilities in Brampton as well as Bramalea GO Station, Brampton GO Station and Mount Pleasant GO Station have been connected to the Brampton Transit's bus network. Furthermore, many high demand places and terminals outside Brampton including Pearson International Airport, University of Toronto at Mississauga, Malton Go Station, Lisgar GO Station, Mississauga City Centre Transit Terminal, Dixie Transitway Station and Westwood Square Bus Terminal in Mississauga, York University and Humber College (North Campus) in Toronto and Vaughan Metropolitan Centre in Vaughan have been connected to Brampton Transit's bus network. Among all above-mentioned places, only Lisgar GO Station is in the vicinity of 407 Transitway where a station site has been located adjacent to the existing GO station. A full list of Brampton Transit's bus routes crossing or or potentially having access to 407 Transitway stations in the study area are shown in **Table 3.18**.

New Transitway service will need to be planned and coordinated with considering the Bramton Transit's local and Züm bus rapid transit routes to provide effective and integrated transit services and avoid competing between transit agencies. While Züm routes serve local or short regional trips within Brampton and surrounding terminals within the neighbour cities, services on the 407 Transitway are anticipated to serve a regional purpose focused on long distance and regional travel. Potentially, MiExpress buses might be operated along 407 Transiway as well. This issue to be discussed in the next level of planning and design.

TABLE 3.17: EXISTING BRAMPTON TRANSIT'S BUS ROUTES

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
511 Züm Steeles	Lisgar Go Station	Humber College
6 James Potter	Highway 407 Park & Ride	Mount Pleasant Village
11 Steels	Lisgar Go Station	Humber College
51 Hereford	Brampton Gateway Terminal	Hereford St & Steeles Ave
58 Financial	Financial Dr & Derry Rd	Mississauga Rd & Lionhead Golf Club Rd
60 Mississauga Road	Mount Pleasant GO Station	Derry Rd & Financial Dr
53 Ray Lawson	Brampton Gateway Terminal	James Potter Rd & Charolais Blvd
54 County Court (loop)	Brampton Gateway Terminal	Sheridan College
56 Kingknoll (loop)	Brampton Gateway Terminal	Ray Lawson Blvd & Hurontario St

3.3.7. MiWay

MiWay is the third largest municipal transit service provider in Ontario with 79 bus routes providing 54 local and 6 express bus services known as MiLocal and MiExpress, as well as 16 school routes throughout Mississauga. Mississauga Transitway has 12 stations including City Centre Transit Terminal.

MiWay also provides BRT service on the Mississauga Transitway which runs, for the most part, parallel to Highway 403 and extends from Winston Churchill Station in western Mississauga in the community of Erin Mills to Renforth Station in the east close to the Highway 401/ Highway 427 interchange. Mississauga Transitway has 11 stations.

Thirteen (13) bus terminals and major destinations in Mississauga and also, two (2) Brampton Transit's bus terminals, one (1) TTC's bus termianl, and five (5) other terminals have been connected to Mississauga's Miway Transit network. Many of these terminals serve GO Bus routes as well. Regarding the connections with regional transit services, MiWay routes connect with GO Transit corridors at 11 GO Train stations including 9 stations in Mississauga and 2 stations in Toronto. Lisgar Go Station's bus terminal which serves Miway and Brampton transit routes is close to a station of 407 Transitway located adjacent to this GO station. Some of MiWay routes are near or intersect at the Highway 407 ETR Corridor. A full list of these routes in the study area is shown in **Table 3.19**.

New Transitway service will need to be planned and coordinated with considering the MiWay local and express routes to provide effective and integrated transit services and avoid competing between transit agencies. While MiWay routes serve local or short regional trips within Mississauga or surrounding terminals within the neighbour cities, services on the 407 Transitway are anticipated to serve a regional purpose focused on long distance and regional travel. Potentially, MiExpress buses might be operated along 407 Transiway as well. This issue to be discussed in the next level of planning and design.

TABLE 3.18: EXISTING MIWAY TRANSIT'S BUS ROUTES

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
9 Rathburn-Thomas	City Centre Transit Terminal (Square One)	Ninth Line & Eglinton Ave W
32 Lisgar GO	Lisgar GO Station	Tenth Line & Trelawny Cir
35 Eglinton-Ninth Line	Islington Subway Transit Terminal	Ninth Line & Eglinton Ave W
38/38A Creditview	Meadowvale Town Centre	Dundas St W & Glengarry Rd
39 Britannia	Meadowvale Town Centre	Renforth Transitway Station
42 Derry	Meadowvale Town Centre	Westwood Square Transit Terminal
43 Matheson-Argentia	Meadowvale Town Centre	Renforth Transitway Station
46 Tenth Line-Osprey	Meadowvale Town Centre	Erin Mills Transitway Station
49 McDowell	Erin Mills Town Centre	Ninth Line & Thomas St
49A McDowell-Streetsville GO	Streetsville GO	Ninth Line & Thomas St
57 Courtneypark	Meadowvale Town Centre	Renforth Transitway Station
61 Mavis	City Centre Transit Terminal (Square One)	Sheridan College
66 McLaughlin	City Centre Transit Terminal (Square One)	Sheridan College
90 Terragar-Copenhagen Loop	Meadowvale GO Station	Derry Rd & Rosehurst Dr
104 Derry Express	Meadowvale Town Centre	Westwood Square Transit Terminal
108 Meadowvale Business Express	Islington Subway Transit Terminal	Argentina Rd & Winston Churchill Blvd
321 Stephen Lewis-Joan of Arc	Churchill Meadows Blvd & Thomas St	Winston Churchill Blvd & Artesian Dr
341 Ninth Line-Thomas	Ninth Line & Eglinton Ave W	Thomas St & Tenth Line

3.3.8. GO Transit

GO Transit is the regional public transit service for the Greater Toronto and Hamilton Area with a network of seven (7) train lines and forty-three (43) bus lines. In total, 66 GO train stations and 15 bus terminals plus numerous stops have been connected to GO Transit service. Milton GO train line and seven (7) GO bus lines travel through the 407 Transitway study area. A full list of GO Transit lines crossing or potentially having access to 407 Transitway stations in the study area are shown in **Table 3.20**.

New Transitway service will need to be planned and coordinated with considering the GO Bus routes to provide effective and integrated transit services and avoid competing between regional transit agencies.

TABLE 3.19: EXISTING GO TRANSIT'S TRAIN AND BUS ROUTES

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
Milton GO Train	Toronto Union Station	Milton GO Station
20 Milton – Oakville GO Bus	Milton GO Station	Oakville GO Station
21 Milton GO Bus	Toronto Union Station Bus Terminal	Different destinations including Milton, Lisgar, Meadowvale, Erindale and Dixie GO Stations and City Centre Transit Terminal (Square One)
27 Milton – North York GO Bus	Milton GO Station	Finch Bus Terminal in Toronto
40 Hamilton – Richmond Hill GO Bus	Hamilton GO Centre	Richmond Hill Centre

3.4. Municipal Services and Utilities

Through the Planning stage, utility companies/municipalities within the 407 Transitway study area were contacted to gather all the existing and planned utility and municipal service information. The following agencies were contacted:

Enbridge;
Allstream;
Hydro One;
Rogers;
Bell Canada;
Emerald Energy;
407 ETR;
The City of Vaughan;
The City of Brampton;
The City of Mississauga;
The City of Toronto;
The Region of Peel; and,
The Regional Municipality of York.

The utility and municipal service information affecting the runningway/stations and associated facilities is illustrated on the horizontal and vertical alignment plates (end of **Chapter 5** of this EPR). **Chapter 6** of this EPR addresses the potential conflicts and proposed mitigation measures.