Chapter 3 – Existing and Future Conditions

407 TRANSITWAY – WEST OF HURONTARIO STREET TO EAST OF HIGHWAY 400

MINISTRY OF TRANSPORTATION - CENTRAL REGION

TABLE OF CONTENTS

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. The study area includes a one-kilometer wide corridor centered on 407 ETR from west of Hurontario Street to east of Highway 400. 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 Environment

3.1.1. Physiography and Soils

According to Chapman and Putnam (1984), the entire study area is located within the Peel Plain physiographic region. However, according to the TRCA (Humber River and Etobicoke and Mimico Watersheds mapping), although the majority of the study area is located within the Peel Plain physiographic region, portions of the east end of the study area are located within the South Slope physiographic region. All of the lands in the study area between east of McLaughlin Road and west of Finch Avenue are classified as Peel Plain (TRCA 2010). The lands located between east of Finch Avenue and Islington Avenue are classified as South Slope, as is the last portion of the study area between east of Highway 400 and west of Jane Street. The remaining portion of the study area between Islington Avenue and Highway 400 is classified as Peel Plain (TRCA 2008).

Both the Peel Plain and South Slope extend through the Regions of Peel and York and the City of Toronto. The Peel Plain is a level to undulating tract of clay soils with imperfect drainage, through which the Humber River, Etobicoke Creek, Mimico Creek and its tributaries have carved deep valleys (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 moranic, consisting of a ground moraine with limited relief (Chapman and Putnam 1984).

Soils surrounding 407 ETR in the study area are classified as: Peel clay, Chinguacousy clay loam, Malton clay, Fox sandy loam, Berrien sandy loam and bottom lands (Hoffman and Richards 1953; 1955). The dominant soil throughout the study corridor is Peel clay, broken up by bottom lands associated with area watercourses, a series of pockets of Malton clay, two areas of Chinguacousy clay loam, and one area each of Fox sandy loam and Berrien sandy loam.

REGIONAL GEOLOGY

Based on the Quaternary geology mapping, the flat lying upland areas of the proposed Transitway study area are underlain by relatively fine grained post-glacial lake sediments and glacial deposits of clayey silt till. On the eastern slope of the Humber River Valley, west of Pine Valley Drive, relatively coarse grained glacial lake deposits of sand are mapped. In the Humber River Valley and in the other stream valleys within the study area, relatively coarse grained recent stream deposits of sand are indicated. Outcrops of shale and limestone bedrock may be exposed in stream valleys in some locations to the west of the Humber River.

3.1.2. Contaminated Properties and Waste

Based on existing land use information obtained to date, there are some properties within the study area which would require further environmental investigation to assess the potential presence of subsurface impacts. Further assessment (in the form of site visits, Preliminary Site Screenings, and Phase I and II ESAs) may be required depending on property needs. The properties should be considered on a case-by-case basis to determine the need for further assessment during project implementation, specifically during property acquisition. The Contamination Overview Study (Golder 2018) prepared for the TPAP provides further information on contaminated properties and waste (see **Appendix N of this EPR**).

In general, properties currently or historically 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. Any agricultural properties with active farming infrastructure (i.e. barns, sheds, livestock pens) within 50 m of the right-of-way have been identified as representing issues of potential environmental concern due to the potential petroleum hydrocarbon, pesticide, and nutrients impacts associated with these operations; however, cultivated fields have not been identified.

3.1.3. Drainage

The proposed 407 Transitway falls predominately in the jurisdiction of the Toronto and Region Conservation Authority (TRCA), with a small segment extending into the jurisdiction of the Credit Valley Conservation (CVC). The segment within TRCA limits crosses three watersheds: Etobicoke Creek, Mimico Creek, and Humber River. There are twenty-four (24) watercourses within the study limits, out of which twenty-one (21) cross the transitway. The remaining watercourses were identified as minor conveyance features with small localized tributary areas that the proposed 407 Transitway will not impact because

of grade difference.

A summary of the Drainage, Hydrology, Stormwater Management, and Floodplain Hydraulics Report (referred in the EPR as the "Drainage 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 the well record cross-sections, the local geology in the western half of the study area, west of Goreway Drive, generally consists of glacial till or clay overburden over relatively shallow bedrock. In some wells, bedrock was encountered at less than 10 m below ground surface. Zones of sand within the overburden were reported in some of the records. Bedrock in this area was reported between elevations of approximately 170 m to 190 m and dipping to 150 masl from east of Airport Road to Goreway Drive.

East of Goreway Drive, the geology generally is logged as glacial till or clay at ground surface. Between Goreway Drive and the Humber River, a confined sand and gravel aquifer was generally encountered below an elevation of 150 masl or at depths of approximately 20 to 25 m below ground surface. East of the Humber River, thick deposits of glacial till and/or clayey soils were indicated, with thin water bearing sand zones below elevations of approximately 140 masl. In general, the geology indicated in the well records is consistent with the geology mapping reviewed.

One earth science Area of Natural and Scientific Interest, the Woodbridge Pleistocene Cut, is located in the study area approximately 900 m west of the Lower Humber River. The presence of the Area of Natural and Scientific Interest within the study area does not represent a groundwater issue for the project.

Based on the surficial geology of the study area, significant areas of groundwater recharge are not expected, with the exception of the area of post-glacial lake sand west of Pine Valley Drive. Groundwater discharge is expected to be limited to the lower elevation stream valley areas in the study area. Given the local fine grained geology, the field observations of the stream crossings and the relative elevations of the streams, only the Humber River is expected to be a significant groundwater discharge zone, although it is likely that some discharge is occurring in the other stream channels as well.

GROUNDWATER RESOURCES

Based on MECP well records and field observations, water wells have been in use historically throughout the study area; however, given the expansion of the urban area of the Cities of Brampton, Mississauga, Toronto and Vaughan, it is anticipated that municipal water supplies are available to properties within the study area. As such, it is not expected that properties are dependent on groundwater wells for water supply.

Based on a review of the wells records, there are a total of 207 well records within the study area. Of the 207 well records, 78 records are for water supply production wells with 69 of the production wells having been drilled prior to 1980. The remaining records were for test holes and observation wells. Of the production wells, 15 were reported to be large diameter bored wells and three were reported to be shallow, less than 10-metres deep. Nearly half of the production wells (38) were greater than 30 m deep and bedrock was reported at varying depths in 53 of the well records. Five of the production wells had initial test pumping rates above 100 L/min, with one irrigation well (Record # 6906846) reportedly tested at a rate of 546 L/min. Well record # 6906846 is located in the Humber River Valley, west of Islington Avenue. Three of the wells were recorded as flowing at the time of drilling. These wells are also located in the Humber River Valley, west of Islington Avenue. Golder is aware, based on previous drilling experience, of flowing artesian groundwater conditions in the vicinity of 407 ETR and the Humber River. In addition to the flowing wells, of the 96 wells which reported static water levels, eight wells recorded a static water level of less than 3 m below the ground surface.

The presence of shallow stream valleys and ponds in the vicinity of the study area suggest the possible presence of high water table within the upland portion of the study area. High water table should also be anticipated in the stream valleys which cross the study area.

MECP's Interpretive Bulletin on Source Water Protection (August 30, 2013) was considered during the assessment. Based on on-line mapping available from the Regional Municipalities of York and Peel, there are no wellhead protection areas or municipal wells within the study area. The City of Toronto does not use groundwater for its municipal water supply. 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.

In summary, the following hydrogeologic conditions are noted:

- Given the urbanized setting of the study area, it is unlikely that properties within the study area are wholly dependent on groundwater for supplies and it is possible that no wells remain in use in the study area.
- 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 local areas of higher groundwater recharge may be associated with the mapped sand areas immediately east of the Humber River and in the stream valleys. Recharge in these areas likely flows and discharges directly to the adjacent streams rather than recharging deeper aquifer systems.
- Areas of groundwater discharge are expected in stream channels and valley bottoms.
- Areas of relatively coarse-grained sandy soils may be present at shallow depths to the east of the Humber River. As well, areas of shallow water table may be present through the flat-lying upland sections of the study area and in conjunction with stream valleys. Excavation and construction below the water table in saturated soils may present challenges, including the need for de-watering. Excavations for culverts, bridges and buried utilities may encounter shallow groundwater that could need to be actively managed during construction.

Appendix M of this EPR presents the Secondary Source Groundwater Investigation completed for this project.

3.1.5. Fish and Fish Habitat

The study area spans four main watersheds: Credit River, Etobicoke Creek, Mimico Creek, and Humber River. These watersheds are managed under the jurisdiction of the MNRF Aurora District and two Conservation Authorities: CVC and TRCA.

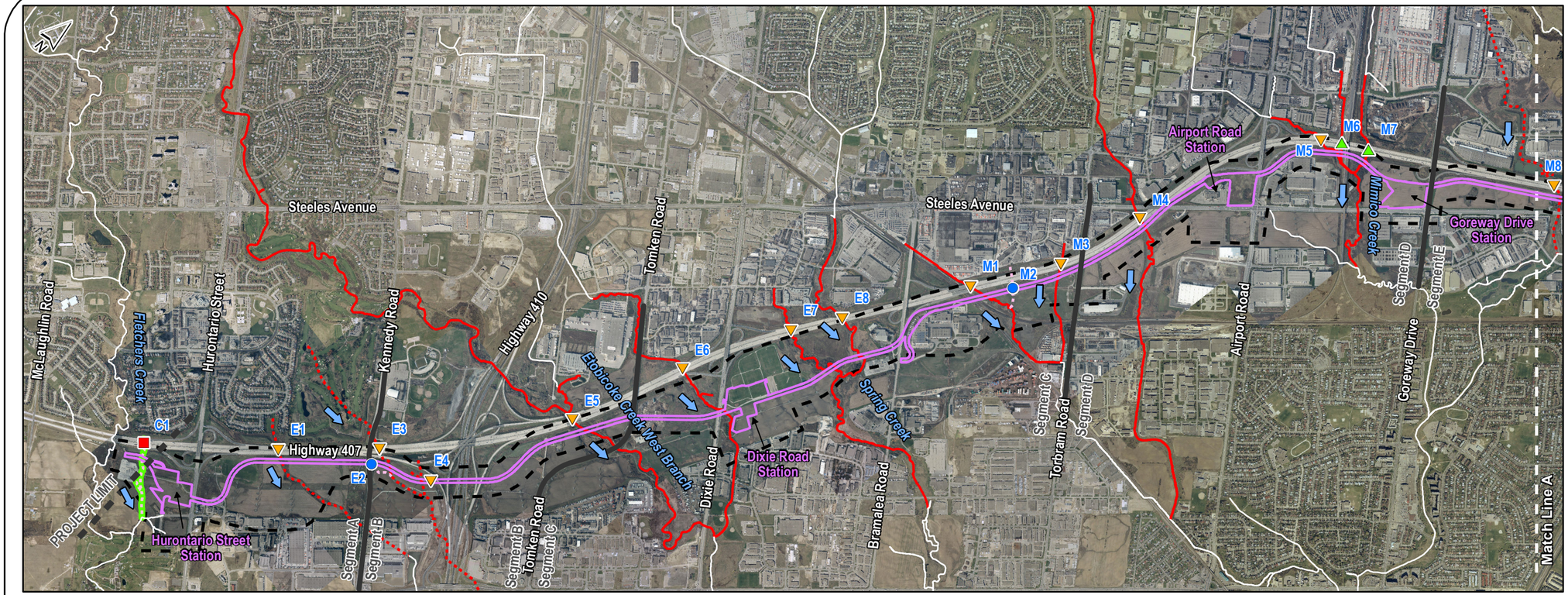
A search of the Natural Heritage Information Centre (NHIC) database (MNRF 2015) and the Fisheries and Oceans Canada (DFO) aquatic species at risk mapping (2015) was completed, and revealed one aquatic species at risk, Redside Dace (*Clinostomus elongatus*), as occurring within the vicinity of the study area at Fletchers Creek (Credit River watershed) (just west of the study area) and Rainbow Creek (Humber River watershed). This species is regulated as 'Endangered' under the Ontario *Endangered Species Act* (ESA), 2007. As of May 2, 2017, Redside Dace is now also regulated federally as 'Endangered', as it has been added to Schedule 1 of the Canada *Species at Risk Act* (SARA) (9). MNRF confirmed the presence of Redside Dace within the study area in their letters dated February 4, 2016 and January 10, 2018, and they provided modified information regarding the presence of Redside Dace via personal correspondence on December 9, 2016. During the December 9, 2016 correspondence, MNRF indicated that Redside Dace regulated habitat does not occur within Rainbow Creek (now historical); however, Redside Dace contributing habitat was confirmed in a tributary of Fletchers Creek (C1 in **Figure 3.1**), although this watercourse is located just west of the westerly study limits.

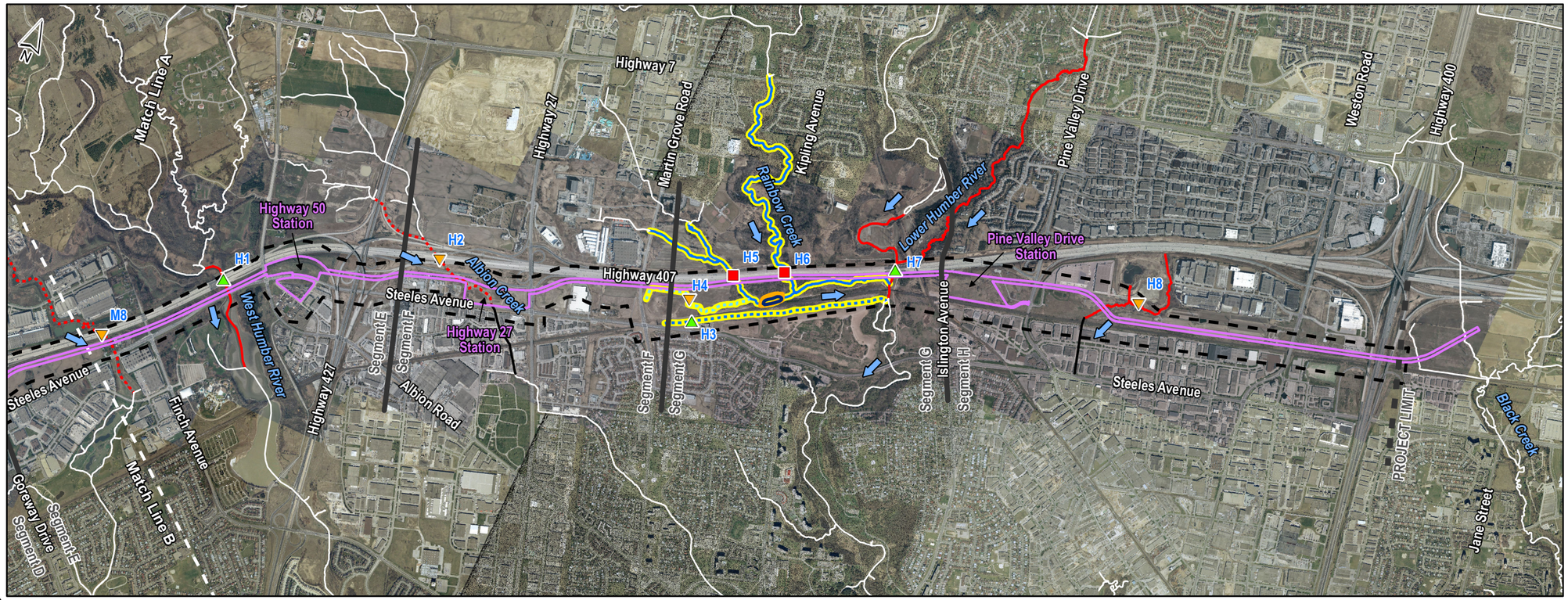
In accordance with the MTO Fish Guide, a project notification and MNRF information request letter was sent to the MNRF Aurora District Office on November 11, 2015 and December 8, 2015 requesting information regarding the thermal regime of the watercourses located within the study area, habitat information, available data, fisheries management considerations, sensitivity and in-water timing windows for construction. An email response was received on February 5, 2016 from Megan Eplett, Management Biologist at MNRF Aurora District. This fisheries data, including the MNRF interpretation of sensitivity, is discussed below and further details, including community information, are presented in **Table 3.1**. In addition to the original data request sent to the MNRF, LGL requested a change to some of the sensitivities that were initially provided based on the results of the detailed field investigations conducted by LGL, as per the MTO Fish Guide. This request was sent via email on November 15, 2016, and an email response was received on December 9, 2016 from Ben Keen, Management Biologist at MNRF Aurora District. Updated sensitivities, based on LGL and MNRF interpretation, are presented below.

In addition to the required correspondence with MNRF, in accordance with the MTO Fish Guide, CVC and TRCA were also contacted by Parsons in November 2015 to request any available fisheries information from their records. An email response from TRCA was received on January 5, 2016 with fish point data for watercourses within the Etobicoke Creek, Mimico Creek and Humber River watersheds. Email responses from CVC were received on January 26, 2016 and February 1, 2016, providing fish point data for watercourses within the Fletchers Creek subwatershed.

EXISTING FISH AND FISH HABITAT CONDITIONS

Aquatic habitat for each of the watercourses within the study area was documented in detail based on the review of secondary source information and a two-season field investigation. LGL Fisheries Specialists conducted fisheries surveys on June 3, 6 and 9, August 15, and September 14 and 20, 2016. A summary of the existing fish and fish habitat conditions, which includes habitat and fish community information, is presented in **Table 3.1** and is illustrated in **Figure 3.1** The thermal regime, fish community, in-water timing window, important/exceptional habitat and species at risk information for each watercourse in **Table 3.1** is based on data received from MNRF (and LGL's field investigation where no data was available from MNRF).





LEGEND

- Field Investigation Area
- Impact Assessment Corridor
- Area of Natural and Scientific Interest (Woodbridge Pleistocene Cut)
- Environmentally Significant Area (Woodbridge Cut)
- Watercourse Flow Direction
- Watercourse - Coldwater Permanent
- Watercourse - Coldwater Intermittent
- Watercourse - Coldwater Ephemeral
- Watercourse - Warmwater Permanent
- Watercourse - Warmwater Intermittent
- Watercourse - Warmwater Ephemeral
- Watercourse Piped
- Watercourse Not Surveyed
- Watercourse - Redside Dace Habitat Contributing
- Watercourse - Redside Dace Habitat Historical

Habitat Sensitivity

- High with opportunity for enhancement
- Moderate with opportunity for enhancement
- Low with opportunity for enhancement
- Not fish habitat

Data Sources: Ministry of Natural Resources and Forestry, LGL field investigatons spring/summer 2016.

800 400 0 800 Metres

407 TRANSITWAY WEST - FISHERIES OPPORTUNITIES AND CONSTRAINTS

LGL LIMITED
environmental research associates

Project:	TA8558	**Figure:**	3.1
Date:	June, 2018	**Prepared By:**	MWF
Scale:	1 : 14,000	**Checked By:**	SLL

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TABLE 3.1: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP OR 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***
CREDIT RIVER WATERSHED													
14-20001	C1: Tributary of Fletchers Creek (located just west of study limits)	4833879 mN	603199 mE	Ephemeral	Not provided	None	**Redside Dace** contributing (MNRF 2016). Not sampled by LGL (no flow).	Upland soils	Terrestrial (cattails present downstream of study area)	N/A	N/A	Identified as Contributing Redside Dace Habitat by MNRF	July 1- September 15
ETOBICOKE CREEK WATERSHED													
14-20001	E1: Tributary of Etobicoke Creek West Branch	4834691 mN	603910 mE	Intermittent	Warmwater	Seasonal (refuge habitat in online pond)	White Sucker, Johnny Darter, Tessellated Darter, Golden Shiner, Common Shiner, Spotfin Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Longnose Dace, Creek Chub (MNRF 2016). Cyprinids Spp. (LGL 2016).	Silt, detritus	Cattails, submerged, floating aquatic	Barrier to fish identified D/S of the pond	N/A	N/A	July 1- March 31
	E2: Tributary of Etobicoke Creek West Branch	4835222 mN	604553 mE	Ephemeral	Not provided	None	Not provided (MNRF 2016). Not sampled by LGL (no flow).	Upland soils	Terrestrial	N/A	N/A	N/A	Not Provided
	E3: Tributary of Etobicoke Creek West Branch	4835334 mN	604403 mE	Intermittent	Warmwater	Seasonal	White Sucker, Johnny Darter, Tessellated Darter, Golden Shiner, Common Shiner, Spotfin Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Longnose Dace, Creek Chub (MNRF 2016). Cyprinids Spp. (LGL 2016).	Silt, cobble	Cattails, submerged	Small buffer from agricultural activities, channel appears to be regularly dredged	N/A	N/A	July 1- March 31
	E4: Tributary of Etobicoke Creek West Branch	4835451 mN	604796 mE	Intermittent	Not provided	Indirect	Not provided (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt	Terrestrial, cattails	Small buffer from agricultural activities	N/A	N/A	July 1-March 31
	E5: Etobicoke Creek West Branch	4836695 mN	605169 mE	Permanent	Warmwater	Direct	Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Johnny Darter, Longnose Dace, White Sucker, Brook Stickleback, Fathead Minnow, Rock Bass, Northern Hog Sucker, Rainbow Darter (MNRF 2016; TRCA 2016). Rock Bass, Tessellated Darter, Rainbow Darter, Fantail Darter, Blacknose Shiner, Spottail Shiner (MNRF 2016). Central Stoneroller, Green Sunfish (TRCA 2016). Cyprinids Spp. (LGL 2016).	Cobble, gravel, boulder, sand, silt	Terrestrial	ATV use has damaged banks, connection to adjacent wetland	Groundwater sources noted to the west of the watercourse (no direct connection to the creek at the time of the site visit)	N/A	July 1- March 31

TABLE 3.1: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP OR 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***
	E6: Tributary of Etobicoke Creek West Branch	4837641 mN	605391 mE	Permanent	Warmwater	Direct	Blacknose Dace, Creek Chub, Brook Stickleback (MNRF 2016; TRCA 2016) Rock Bass, White Sucker, Johnny Darter, Tessellated Darter, Common Shiner, Bluntnose Minnow, Longnose Dace, Fathead Minnow (MNRF 2016). Creek Chub, Central Stoneroller (LGL 2016).	Cobble, gravel, sand, silt, detritus, boulder	Cattails, emergent, submerged vegetation	Culvert at hydro access road restricting flows	N/A	N/A	July 1- March 31
	E7: Tributary of Spring Creek	4838515 mN	605683 mE	Permanent	Warmwater	Direct	Rock Bass, White Sucker, Johnny Darter, Tessellated Darter, Common Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Longnose Dace, Creek Chub, Brook Stickleback, Fathead Minnow (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt, sand, gravel, cobble	Emergent, submerged vegetation	ATV use has damaged banks	N/A	N/A	July 1- March 31
	E8: Spring Creek	4838898 mN	605861 mE	Permanent	Warmwater	Direct	Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Common Shiner, Creek Chub, Fathead Minnow, Longnose Dace, White Sucker, Golden Shiner, Pumpkinseed, Spottail Shiner, Green Sunfish, Pumpkinseed, Central Stoneroller, Johnny Darter (TRCA 2016). Creek Chub, Central Stoneroller, Common Shiner, Rosyface Shiner, Green Sunfish, White Sucker (LGL 2016).	Gravel, cobble, sand, silt, boulder	Terrestrial	Small plastic beads (possibly from industrial activity) were identified all through the channel	N/A	N/A	July 1- March 31
MIMICO CREEK WATERSHED													
14-20001	M1: Tributary of Mimico Creek	4839863 mN	606293 mE	Permanent	Warmwater	Direct	Not provided (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt, sand, gravel, detritus, rip rap	Cattails, *Phragmites*	CN crossing likely barrier to fish movement	N/A	N/A	July 1- March 31
	M2: Tributary of Mimico Creek	4840112 mN	606522 mE	Ephemeral	Not provided	None	Not provided (MNRF 2016). Not sampled by LGL (no flow).	Upland soils	Terrestrial	N/A	N/A	N/A	Not provided
	M3: Tributary of Mimico Creek	4840544 mN	606597 mE	Permanent	Warmwater	Indirect	Not provided (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt, detritus, rip rap	Cattails	Watercourse is channelized through the study area	N/A	N/A	July 1- March 31
	M4: Tributary of Mimico Creek	4841270 mN	606698 mE	Permanent	Warmwater	Direct	Fathead Minnow, Creek Chub (MNRF 2016). Creek Chub, Fathead Minnow, Fathead Minnow (rosy-red strain) (LGL 2016).	Silt, detritus, sand, gravel, cobble	Cattails, emergent, submerged vegetation	Bank erosion was noted	N/A	N/A	July 1- March 31

TABLE 3.1: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP OR 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***
	M5: Tributary of Mimico Creek	4842796 mN	607098 mE	Permanent	Warmwater	Direct	Creek Chub, Fathead Minnow (MNRF 2016; TRCA 2016). White Sucker, Mottled Sculpin, Common Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Brook Stickleback (MNRF 2016). Creek Chub (LGL 2016).	Cobble, gravel, sand, silt, rip rap	Cattails	CN crossing likely barrier to fish movement	N/A	N/A	July 1- March 31
	M6: Tributary of Mimico Creek	4842917 mN	607212 mE	Permanent	Warmwater	Direct	White Sucker, Mottled Sculpin, Common Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Creek Chub, Brook Stickleback, Fathead Minnow (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Gravel, silt, sand, detritus	Cattails	CN crossing likely barrier to fish movement	N/A	N/A	July 1- March 31
	M7: Mimico Creek	4843051 mN	607388 mE	Permanent	Warmwater	Direct	Creek Chub (MNRF, TRCA, 2016). White Sucker, Mottled Sculpin, Common Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Brook Stickleback, Fathead Minnow (MNRF 2016). Creek Chub, Fathead Minnow, Fathead Minnow (rosy-red strain), Brook Stickleback (LGL 2016).	Gravel, sand, silt, cobble	Cattails, submerged vegetation	Bank erosion was noted	N/A	N/A	July 1- March 31
	M8: Tributary of Mimico Creek	4844045 mN	608536 mE	Intermittent	Warmwater	Seasonal	White Sucker, Mottled Sculpin, Common Shiner, Bluntnose Minnow, Eastern Blacknose Dace, Creek Chub, Brook Stickleback, Fathead Minnow (MNRF 2016). Cyprinids Spp. (LGL 2016).	Silt, detritus	Cattails, *Phragmites*	N/A	N/A	N/A	July 1- March 31
HUMBER RIVER WATERSHED													
14-20001	H1: West Humber River	4844845 mN	609243 mE	Permanent	Warmwater	Direct	Rock Bass, Goldfish, White Sucker, Common Carp, Johnny Darter, Northern Hog Sucker, Largemouth Bass, Common Shiner, Creek Chub, Pumpkinseed (MNRF 2016; TRCA 2016). Blacknose Dace, Fantail Darter, Mimic Shiner, Rainbow Darter (TRCA 2016). Yellow Bullhead, Northern Pike, Tessellated Darter, Bluegill, Rainbow Trout, Spottail Shiner, Rosyface Shiner, Bluntnose Minnow, Fathead Minnow,	Silt, detritus, boulder	Submerged, emergent vegetation, cattails	Riparian vegetation sparse in study area	Groundwater contributions noted	N/A	July 1- September 15

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							Blackchin Shiner, Brown Bullhead, Yellow Perch (MNRF 2016). Cyprinids Spp. (LGL 2016).						
	H2: Albion Creek	4845720 mN	610713 mE	Intermittent	Warmwater	Indirect	Not Provided (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt	Cattails, terrestrial grasses	Channel is piped downstream of Steeles Avenue	N/A	N/A	July 1- March 31
	H3: Tributary of the Lower Humber River	4846030 mN	611629 mE	Intermittent	Coldwater	Indirect	White Sucker, Brook Stickleback, Rainbow Darter, Johnny Darter, Tessellated Darter, Northern Hog Sucker, Largemouth Bass, River Chub, Emerald Shiner, Common Shiner, Blackchin Shiner, Sand Shiner, Bluntnose Minnow, Fathead Minnow, Longnose Dace, Creek Chub, **Redside Dace (Historical)** (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt	Cattails, *Phragmites*, terrestrial	Watercourse is channelized	Groundwater contributions noted	N/A	July 1- September 15
	H4: Tributary of Rainbow Creek	4846271 mN	612639 mE	Ephemeral	Coldwater	None	White Sucker, Brook Stickleback, Rainbow Darter, Johnny Darter, Tessellated Darter, Northern Hog Sucker, Largemouth Bass, River Chub, Emerald Shiner, Common Shiner, Blackchin Shiner, Sand Shiner, Bluntnose Minnow, Fathead Minnow, Longnose Dace, Creek Chub, **Redside Dace (Historical)**, Eastern Blacknose Dace, Pumpkinseed (MNRF 2016). Not sampled by LGL (no flow).	Terrestrial	Isolated sections of cattails	N/A	N/A	N/A	July 1- September 15
	H5: Tributary of Rainbow Creek	4846579 mN	612893 mE	Permanent	Coldwater	Direct	White Sucker, Brook Stickleback, Rainbow Darter, Johnny Darter, Tessellated Darter, Northern Hog Sucker, Largemouth Bass, River Chub, Emerald Shiner, Common Shiner, Blackchin Shiner, Sand Shiner, Bluntnose Minnow, Fathead Minnow, Longnose Dace, Creek Chub, **Redside Dace (Historical)**, Eastern Blacknose Dace, Pumpkinseed (MNRF 2016). Cyprinids Spp. (LGL 2016 visual observations); Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt, sand, gravel, rip rap	Cattails, emergent, submerged vegetation	Barriers to fish movement identified in study area	Flows through wetland habitat	N/A	July 1- September 15

TABLE 3.1: EXISTING FISH AND FISH HABITAT CONDITIONS SUMMARY TABLE

GWP OR 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***
	H6: Rainbow Creek	4846773 mN	613251 mE	Permanent	Coldwater	Direct	White Sucker, Brook Stickleback, Rainbow Darter, Johnny Darter, Northern Hog Sucker, Common Shiner, Bluntnose Minnow, Fathead Minnow, Longnose Dace, Creek Chub, Blacknose Dace, Pumpkinseed (MNRF 2016; TRCA 2016). Central Stoneroller, Fantail Darter, Green Sunfish, Rock Bass, Rainbow Darter, Golden Shiner (TRCA 2016). **Redside Dace (Historical)** Tessellated Darter, Largemouth Bass, River Chub, Emerald Shiner, Blackchin Shiner, Sand Shiner (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Gravel, sand, silt, rip rap, cobble, detritus	Submerged vegetation, *Phragmites*	Flows adjacent to 407 ETR	N/A	N/A	July 1- September 15
	H7: Lower Humber River	4847166 mN	614038 mE	Permanent	Warmwater	Direct	Rock Bass, White Sucker, Northern Hog Sucker, Pumpkinseed, River Chub, Common Shiner, Rosyface Shiner, Stonecat, Bluntnose Minnow, Longnose Dace, Creek Chub, Fantail Darter, Johnny Darter, American Brook Lamprey (MNRF 2016; TRCA 2016). Blacknose Dace, Central Stoneroller, Rainbow Darter, Rainbow Trout, Green Sunfish, Sand Shiner, Largemouth Bass, Golden Shiner, Lamprey Spp. (TRCA 2016). Brown Bullhead, Brook Stickleback, Common Carp, Yellow Perch, Blackside Darter, Fathead Minnow, Central Mudminnow, Rainbow Darter, Tessellated Darter (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt, sand, gravel, cobble, boulder, detritus	*Phragmites*	N/A	N/A	N/A	July 1- March 31
	H8: Tributary of the Lower Humber River	4847069 mN	614281 mE	Permanent	Warmwater	Indirect	Not provided (MNRF 2016). Sampling conducted by LGL and no catch yielded (LGL 2016).	Silt, detritus, gravel, sand, rip rap	Cattails, emergent, submerged vegetation	Channel is piped downstream of study area	N/A	N/A	July 1- March 31

* Data based on LGL field investigations completed in Spring/Summer of 2016.

** Fish Point Data based on secondary source review including personal correspondence with Credit Valley Conservation (2016), Toronto and Region Conservation Authority (2016), and the Ministry of Natural Resources and Forestry (2016), and LGL field investigations completed in Spring/Summer of 2016.

*** Thermal regime, in-water timing window and sensitivity provided by the Ministry of Natural Resources and Forestry (2016), where missing provided by LGL based on field investigations.

Data collection followed the *PILOT MTO/DFO/OMNR Protocol* (2016), specifically Section 4 of the *Environmental Guide for Fish and Fish Habitat* (MTO 2009).

Watercourses within the study area flow in a generally north to south direction, and ultimately drain into Lake Ontario, with the exception of a tributary of the Lower Humber River (H3), and two tributaries of Rainbow Creek (H4 and H5) which flow in generally an easterly direction along the facility footprint. There are a total of 25 watercourse crossings occurring within the vicinity of the study area: one within the Credit River watershed (although this watercourse is located just west of the study limits); eight within the Etobicoke Creek watershed; eight within the Mimico Creek watershed; and, eight within the Humber River watershed. The locations of these watercourses can be found in **Figure 3.1**. The watercourse labels are numbered from west to east and are preceded by the first letter of the watershed name (i.e., the westerly crossing of the Credit River is labelled C1). Below is a general description of the watersheds and watercourses which occur within the 407 Transitway study area. Detailed information for each watercourse is provided in the Fish and Fish Habitat Existing Conditions and Impact Assessment Report (LGL 2018).

CREDIT RIVER WATERSHED

Although the study area is located within the easterly portion of the Credit River watershed, no watercourses within the Credit River watershed are located directly in the study area. One watercourse within the Credit River watershed is located 55 m west of the 407 Transitway limits: a tributary of Fletchers Creek (Site C1 on **Figure 3.1**). The Fletchers Creek Main Branch is also located beyond the westerly study area limits. As a result, these watercourses are not anticipated to be impacted. The tributary of Fletchers Creek (C1) will remain in this report due to the highlighted sensitivity from MNRF and proximity to the study limits. Based on a review of the Draft Fletchers Creek Restoration Study (CVC 2012a), the tributary of Fletchers Creek (C1) is a headwater feature which conveys surface water from the 407 ETR and surrounding residential areas to the north of the 407 ETR into the Fletchers Creek Main Branch which is classified as coldwater and occupied Redside Dace habitat (MNRF 2016). No fish community or thermal regime data was available for the tributary of Fletchers Creek (C1) from personal correspondence that took place with MNRF and CVC in 2016, although MNRF noted the sensitivity was high.

ETOBICOKE CREEK WATERSHED

There are eight watercourses within the Etobicoke Creek watershed that are located within the 407 Transitway study area. These watercourses include the Etobicoke Creek West Branch and five tributaries, and Spring Creek and one tributary of Spring Creek (Sites E1-E8 on **Figure 3.1**).

According to the Etobicoke and Mimico Creeks Watershed Technical Update Report (TRCA 2010), the fish communities within Etobicoke Creek are comprised of cool and warmwater species. Fish abundance and diversity are reported to be lower in Etobicoke Creek relative to less urban watersheds within the Greater Toronto Area. Migratory salmonids have been reported within Etobicoke Creek, but are unlikely to reach as far north as the 407 Transitway due to barriers to fish passage present downstream (TRCA 2010). A review of the Aquatic Species at Risk Mapping (DFO 2015) confirms that no aquatic species at risk occur within Etobicoke Creek within the vicinity of the study area.

Fish community data for the Etobicoke Creek West Branch and its tributaries provided by TRCA and MNRF (2016 personal correspondence) is consistent with the cool/warmwater fish community information provided by the TRCA (2010). Personal correspondence with MNRF (2016) indicated that all watercourses within the Etobicoke Creek watershed are warmwater and **low** sensitivity or **unknown** sensitivity.

MIMICO CREEK WATERSHED

There are eight watercourses within the Mimico Creek watershed that are located within the 407 Transitway study area. These crossings include Mimico Creek and seven tributaries (Sites M1-M8 on **Figure 3.1**).

According to secondary source review, the fish communities within Mimico Creek are comprised of cool and warmwater species. It has been reported that fish species of greater sensitivity have not been found within this watershed for several decades (TRCA 2010). A review of the Aquatic Species at Risk Mapping (DFO 2015) indicates that no aquatic species at risk occur within Mimico Creek within the vicinity of the study area.

Fish community data for some watercourses within the Mimico Creek watershed was provided by TRCA and MNRF (2016 personal correspondence). Fish data provided is consistent with the cool/warmwater fish community information provided in the Watershed Technical Update Report (TRCA 2010). Personal correspondence with MNRF (2016) indicated that all Mimico Creek watercourses are warmwater (or unknown – M2), and have **moderate**/**low** or **unknown** sensitivities.

HUMBER RIVER WATERSHED

There are eight watercourses within the Humber River watershed that are located within the 407 Transitway study area. These crossings include the main branch of the West Humber River, Albion Creek, the main branch of the Lower Humber River and two of its tributaries, and Rainbow Creek and two of its tributaries (Sites H1-H8 on **Figure 3.1**).

West Humber River Subwatershed

According to the Humber River Watershed Plan (TRCA 2008), the West Humber River occurs within fish management zone (FMZ) 7, which is managed for coolwater species including Redside Dace, Rainbow Darter (*Etheostoma caeruleum*) and Smallmouth Bass (*Micropterus dolomieu*).

Fish community data for the West Humber River (H1) was provided by TRCA and MNRF (2016 personal correspondence). Fish data provided are consistent with a cool/warmwater fish community. No records of Redside Dace were provided by the TRCA or MNRF. MNRF (2016) originally classified the West Humber River as warmwater and **high** sensitivity, although MNRF changed the sensitivity to **moderate** in the most recent correspondence (Dec. 9, 2016).

Middle/Lower Humber River Subwatershed

The Middle/Lower Humber River and its tributaries occur along the edge of three FMZs: 5 (Middle Humber River), 6 (Rainbow Creek) and 10 (Lower Humber River) (TRCA 2008). FMZ 5, to the north of the Transitway alignment, is managed for coolwater species including Redside Dace, Rainbow Darter, Blackside Darter (*Percina maculata*), Rainbow Trout (*Oncorhynchus mykiss*) and Smallmouth Bass. FMZ 6, also to the north of the Transitway alignment, is managed for coolwater species including Redside Dace, Rainbow Darter and Blackside Darter. FMZ 10, to the south of the Transitway alignment, is managed for coolwater species including Rainbow Darter and Smallmouth Bass (TRCA 2008).

Some fish community data for the West Humber River, Lower Humber River and Rainbow Creek were provided by TRCA and MNRF (2016 personal correspondence) and is consistent with a cool/warmwater fish community and includes records of Rainbow Trout, a migratory gamefish species, in the main branch. No records of Redside Dace were provided by the TRCA in the 2016 personal correspondence.

Personal correspondence with MNRF (2016) indicated that Albion Creek (H2) supports warmwater fish habitat. A sensitivity classification was not originally provided, however LGL assigned a **low** sensitivity to this watercourse as a result of field investigations. Rainbow Creek and its tributaries (H4-H6) were originally classified by MNRF as **high** sensitivity and supporting coldwater fish habitat, although MNRF indicated in the most recent personal correspondence (December 9, 2016) that the sensitivity of H4 is now **low**. It was originally noted by MNRF that Rainbow Creek (H6) supports Redside Dace occupied habitat, and the Rainbow Creek tributaries support historical Redside Dace habitat (MNRF 2016). However, since that time, it was confirmed by MNRF (2016) that Redside Dace regulated habitat is not present in Rainbow Creek and this watercourse, like the Rainbow Creek tributaries, supports historical Redside Dace habitat. The main branch of the Lower Humber River (H7) was originally classified as warmwater, however no sensitivity information was originally provided. MNRF indicated in the most recent personal correspondence (December 9, 2016) that the sensitivity of H7 is **moderate**. One Lower Humber River tributary (H3) was originally classified by MNRF as **high** sensitivity and supporting coldwater fish habitat (although MNRF indicated in the most recent personal correspondence (December 9, 2016) that the sensitivity of H3 is **moderate**), and the second Lower Humber River tributary (H8) was originally classified by MNRF as **low** sensitivity and supporting warmwater fish habitat.

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 evidence of critical habitat in the form of groundwater discharge observed at several watercourses during field investigations. Groundwater discharge areas, depending upon the amount of flow, can be used by fish as seasonal refugia or spawning habitat.

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 and agriculture. 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 (with the exception of H1 which was identified as a warmwater watercourse but is subject to an in-water timing window of July 1-September 15). Coldwater and Redside Dace watercourses are subject to an in-water timing window of July 1 to September 15.

Based on personal correspondence with MNRF (2016), the habitat sensitivity of the watercourses located within the study limits ranges from none to low to moderate to high. Where sensitivity was not provided by MNRF, LGL assigned sensitivities based on the results of the field investigations. Details regarding interpretation of final sensitivity are described above.

Redside Dace is listed provincially as an 'Endangered' species and is regulated by the Ontario ESA, 2007. As of May 2, 2017, Redside Dace is now also regulated federally as 'Endangered', as it has been added to Schedule 1 of SARA (9). It states on the SARA registry page that "restrictions imposed on infrastructure projects that affect Redside Dace habitat are already in place due to this species being listed under Ontario's ESA *2007* and the prohibitions under SARA are not anticipated to result in any additional impacts to the delivery and implementation of infrastructure projects." C1 (tributary of Fletchers Creek) with Redside Dace (contributing habitat) is unlikely to be affected as a result of this project. However, if there is disturbance to this feature, specialized mitigation measures to prevent negatvie impacts to this species and/or its habitat may be required. It is understood at this time, that a permit from DFO would be required in addition to a permit from MNRF only when works are to be undertaken in "occupied" habitat. Therefore, if there are any impacts to C1, it would likely be exempt from a SARA permit because the habitat is "contributing". 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, if necessary. Depending on the proposed works, structure types, and area of regulated habitat being affected, the activities can be registered with the MNRF and/or a letter of advice may be issued. An ESA 17(2)(c) overall benefit permit could be avoided if effects on the species can be minized and enhancements to the habitat are undertaken beyond the immediate work area. If it is determined effects to the species are of a certain magnitude, an ESA 17(2)(c) overall benefit permit may be required.

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 CVC and the TRCA provided Ecological Land Classification (ELC) data.

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 within the study area consist of a mixture of terrestrial, wetland and cultural

communities. The 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. Forest and wetland communities are 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 delineated were observed to be in a disturbed state associated with existing land use practices; this was particularly notable along community edges.

A total of 20 ecosites were identified within the study area based on field surveys undertaken by LGL staff throughout the spring, summer and fall of 2016. Field surveys were undertaken on May 18, June 17 and 27, July 25, 26, and 27, August 15, 24 and 31, and October 25, 2016. The communities identified include three combined vegetation communities including Mineral Cultural Meadow/Mineral Cultural Thicket (CUM1-1/CUT1), Mineral Cultural Thicket/Mineral Cultural Woodland (CUT1/CUW1), and Mineral Meadow Marsh/Mineral Shallow Marsh (MAM2/MAS2). 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 include several Deciduous Forest (FOD) and Mixed Forest (FOM) types, several wetland communities including Mineral Meadow Marsh (MAM2), Reed-Canary Grass Mineral Meadow Marsh (MAM2-2) and Deciduous Swamp (SWD), a Mineral Open Bluff (BLO1), and a Mineral Shrub Beach/Bar (BBS1). Cultural community types were also identified including Mineral Cultural Meadow (CUM1), Mineral Cultural Thicket (CUT1), Mineral Cultural Woodland (CUW1), and Coniferous Plantation (CUP3). Several very small wetland patches, typically less than 0.1 ha and dominated by common reed, were identified as inclusions within cultural meadow communities located adjacent to the 407 ETR. Many of these inclusions were very dry in 2016 and likely established due to seasonal runoff from the highway.

Several areas not identified as ELC vegetation communities were observed including manicured areas and storm water ponds (SWM). Manicured areas (M) include mown lawns, gardens and planted trees. The berms surrounding all of the storm water ponds observed, were planted with a low density of shrubs and trees, and ground flora within these areas were comprised of disturbance tolerant species typically found within the surrounding landscape. Common reed, and to a lesser extent cattails, were noted to have established and are dominant along the water's edge, within most storm water ponds.

The ELC vegetation communities identified during field surveys undertaken by LGL staff are described in **Table 3.2** and presented in **Figure 3.2a, 3.2b and 3.2c**.

FLORA

A total of 230 plant species were recorded within the study area, however, 12 of these plants could only be identified to genus. Of the 218 plants identified to species, 136 are native (62%) and 82 are non-native (38%). 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 within the surrounding area including residential, 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 non-native and/or invasive plant species.

Higher quality vegetation communities with a more diverse range of native species, particularly forest and wetland communities, were associated with Lower Humber River and Rainbow Creek. These communities were identified within the vicinity of the Woodbridge Pleistocene Cut ANSI and Woodbridge Cut ESA and are located on a ridge that is a result of modern and older alluvial deposits.

SPECIES AT RISK

No plant species at risk (listed as 'Threatened', 'Endangered', or 'Species of Special Concern') were identified within the study area during field investigations undertaken in 2016.

Butternut trees (*Juglans cinerea*) were identified in the vicinity of the study area based on a review of the MNRF Natural Heritage Information Centre (NHIC 2015), data from TRCA, a letter received from the MNRF dated February 4, 2016 and an email received from the MNRF on January 10, 2018. No plant species at risk occurrence records were provided by CVC. The information received indicates that one butternut has been recorded in the study area, however, the exact location of that record is unknown. Several of these element occurrence records are north of 407 ETR and outside of the study area. Two butternut records with potential to be located within the study area exist south of 407 ETR in the Islington Avenue and Kipling Avenue areas. A search for butternut, which is regulated as 'Endangered' by both the Canada SARA and the Ontario ESA, was undertaken within the vicinity of the south side of 407 ETR and Kipling Avenue and Islington Avenue. No butternut trees were identified during these field investigations, nor were any butternut trees identified during additional field investigations carried out throughout the remainder of the study area.

A total of 21 TRCA plant species of concern (L1 to L3) and species identified as rare in York and Peel Regions, were identified within several communities associated with the study area.

TABLE 3.2: SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
TERRESTRIAL – NATURAL/SEMI-NATURAL			
FOD	**Deciduous Forest**		
FOD4	Dry-Fresh Deciduous Forest	**Canopy:** includes black locust (*Robinia pseudoacacia*), riverbank grape, black maple (*Acer nigrum*), and Manitoba maple (*Acer negundo*). **Understory:** includes black locust, Manitoba maple, common buckthorn, riverbank grape and tartarian honeysuckle (*Lonicera tatarica*). **Ground Cover:** includes Kentucky bluegrass (*Poa pratensis* ssp. *Pratensis*), Robert geranium (*Geranium robertianum*), Canada goldenrod (*Solidago canadensis*), blue-stemmed goldenrod (*Solidago caesia*) and dames rocket (*Hesperis matronalis*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Moderately dry to fresh moisture regime (4).
FOD6-5 (a-b)	Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	**Canopy:** includes sugar maple (*Acer saccharum* ssp. *saccharum*), white ash (*Fraxinus americana*), basswood (*Tilia americana*), bitternut hickory, black locust, Manitoba maple, eastern white cedar (*Thuja occidentalis*), Eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and black cherry (*Prunus serotina*). **Understory:** includes Manitoba maple, common buckthorn, sugar maple, chokecherry, tartarian honeysuckle, Eastern white cedar, downy thorn (*Crataegus mollis*), English hawthorn (*Crataegus monogyna*), and alternate-leaved dogwood (*Cornus alternifolia*). **Ground Cover:** includes riverbank grape, Pennsylvania sedge (*Carex pensylvanica*), red raspberry (*Rubus idaeus*), white avens, tartarian honeysuckle, and yellowish enchanter's nightshade (*Circaea lutetiana*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Moderately moist to fresh moisture regime, sugar maple dominant (6). • Hardwood associates (-5).
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest	**Canopy:** includes white willow (*Salix alba*), and Manitoba maple. **Understory:** includes Manitoba maple, guelder rose, and riverbank grape. **Ground cover:** includes creeping Charlie (*Glechoma hederacea*), cow parsnip (*Heracleum maximum*), and ostrich fern (*Matteuccia struthipoteris* var. *pensylvanica*).	• Tree cover > 60% (FO). • Deciduous trees > 75% of canopy cover (D). • Moist to fresh moisture regime. Middle to lower slopes, seepage areas and bottomlands topographic positions (7). • Culturally influenced, associated with riparian zone (-3).
FOM	**Mixed Forest**		
FOM3-2	Dry-Fresh Sugar Maple-Hemlock Mixed Forest	**Canopy:** includes sugar maple, white ash, ironwood (*Ostrya virginiana*), and Eastern hemlock. **Understory:** includes sugar maple, common buckthorn (*Rhamnus cathartica*), and basswood. **Ground Cover:** includes sugar maple, common buckthorn, basswood, chokecherry (*Prunus virginiana* var. *virginiana*), riverbank grape (*Vitis riparia*) and garlic mustard (*Alliaria petiolata*).	• Tree cover > 60% (FO). • Conifer tree species > 25% and deciduous tree species > 25% of canopy cover (M). • Moderately dry to fresh soil moisture regime. Typically found on slopes with adequate moisture (3). • Hemlock with sugar maple > 25% of canopy cover and other hardwood associates (-2).
FOM6-1	Fresh-Moist Sugar Maple-Hemlock Mixed Forest	**Canopy:** includes sugar maple, Eastern hemlock, and bitternut hickory (*Carya cordiformis*). **Understory:** includes ironwood (*Ostrya virginiana*), chokecherry, white ash, sugar maple, and common buckthorn. **Ground cover**: includes sugar maple, ironwood, bitternut hickory, common buckthorn, white ash, white avens, sedge (*Carex sp.*) and zig-zag goldenrod (*Solidago flexicaulis*).	• Tree cover > 60% (FO). • Conifer tree species > 25% and deciduous tree species > 25% of canopy cover (M). • Moist to very fresh soil moisture. Middle to lower slopes, seepage areas and bottomland (6). • Hemlock with sugar maple > 25% of canopy cover and other hardwood associates (-1).
FOM7	Fresh-Moist White Cedar-Hardwood Mixed Forest	**Canopy:** includes sugar maple, common buckthorn, Eastern white cedar, white pine, beech (*Fagus grandifolia*), burr oak (*Quercus macrocarpa*), black cherry, ironwood and balsam poplar (*Populus balsamifera*). **Understory:** includes common buckthorn, Eastern white cedar, chokecherry, and guelder rose (*Viburnum opulus*). **Ground cover:** includes common buckthorn, Pennsylvania sedge, Canada thistle (*Cirsium arvense*), garlic mustard, sugar maple and dandelion (*Taraxacum officinale*).	• Tree cover > 60% (FO). • Conifer tree species > 25% and deciduous tree species > 25% of canopy cover (M). • Moist to very fresh moisture regime. Middle to lower slopes, seepage areas and bottomlands (7).
BLO	**Open Bluff**		
BLO1	Mineral Open Bluff	**Canopy:** includes black walnut (*Juglans nigra*), white ash, red maple (*Acer rubrum*), trembling aspen (*Populus tremuloides*), and white elm (*Ulmus americana*). **Understory:** includes black walnut, trembling aspen, staghorn sumac (*Rhus typhina*), Manitoba maple, chokecherry, and tartarian honeysuckle. **Ground cover:** includes Canada goldenrod, wild carrot (*Daucus carota*), Canada thistle, black walnut, orchard grass (*Dactylis glomerata*), coltsfoot (*Tussilago farfara*), and white sweet clover (*Melilotus alba*).	• Tree cover <25%; shrub cover <25% (BL). • Subject to ongoing erosional processes. • Substrate of sand, coarse loam, fine loam or clay (1).

TABLE 3.2: SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
BBS	**Shrub Beach/Bar**		
BBS1	Mineral Shrub Beach/Bar	**Understory:** includes sandbar willow (*Salix exigua*), and Missouri willow (*Salix eriocephala*).	• Tree cover ≤25%; and shrub cover >25%. Active processes less severe, woody species invasion is limited to shrubs (BBS). • Cover varies from patchy and barren to continuous thicket (1).
TERRESTRIAL – CULTURAL			
CUM	**Cultural Meadow**		
CUM1-1 (a-l)	Dry-Moist Old Field Meadow	**Emergent Trees/Shrubs**: includes black walnut, willow (*Salix sp.*), red-osier dogwood (*Cornus sericea* ssp. *sericea*), common buckthorn, and Manitoba maple. **Ground cover:** includes curly-leaf dock (*Rumex crispus*), wild carrot, reed canary grass (*Phalaris arundinacea*), awnless brome (*Bromus inermis* ssp. *inermis*), and common mullein (*Verbascum thapsus*).	• 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).
CUS1	**Cultural Savannah**		
CUS1 (a-b)	Mineral Cultural Savannah	**Canopy:** includes Manitoba maple, trembling aspen, white ash, and black walnut. **Understory:** includes Manitoba maple, red ash (*Fraxinus pennsylvanica*), common buckthorn, white ash, and Russian olive (*Elaeagnus angustifolia*). **Ground cover:** includes spotted touch-me-not (*Impatiens capensis*), Kentucky bluegrass, Canada goldenrod, dame's rocket, sugar maple, orchard grass, and yellowish enchanter's nightshade.	• Cultural communities (CU). • Tree cover <25% shrub cover >25% (S). • Mineral soil (1).
CUT1	**Cultural Thicket**		
CUT1 (a-i)	Mineral Cultural Thicket	**Canopy:** includes common buckthorn, hawthorn (*Crataegus sp.*), sugar maple, white spruce (*Picea glauca*), white ash, black walnut, black locust, Manitoba maple, basswood and white elm. **Understory:** includes common buckthorn, riverbank grape, black walnut, burr oak, black locust, Russian olive, inserted Virginia-creeper (*Parthenocissus vitacea*) and tartarian honeysuckle. **Ground cover:** includes Canada goldenrod, Canada thistle, bird's-foot trefoil (*Lotus corniculatus*), wild teasel (*Dipsacus fullonum* ssp. *Sylvestris*), common buckthorn, awnless brome, Kentucky bluegrass and common milkweed (*Asclepias syriaca*).	• Cultural community (CU). • Tree cover <25%; shrub cover >25% (T). • Mineral soil (1). • Pioneer community resulting from, or maintained by, anthropogenic-based influences.
CUW	**Cultural Woodland**		
CUW1 (a-g)	Mineral Cultural Woodland	**Canopy:** includes Eastern hemlock, sugar maple, white ash, black cherry, black maple, black locust, white elm, Manitoba maple, white spruce and Eastern white cedar. **Understory:** includes common buckthorn, basswood, English hawthorn, large-fruited hawthorn (*Crataegus punctata*), Russian olive, riverbank grape and Manitoba maple. **Ground cover:** includes Virginia creeper, sugar maple, Canada goldenrod, yellow avens (*Geum aleppicum*), Pennsylvania sedge, garlic mustard, Kentucky bluegrass, and Canada thistle.	• Cultural communities (CU). • 25% < tree cover < 35% (W). • Mineral soil (1). • Pioneer community resulting from, or maintained by, anthropogenic-based influences.
CUP	**Cultural Plantation**		
CUP3	Coniferous Plantation	**Canopy:** includes white spruce (*Picea glauca*), white pine (*Pinus strobus*), and Scotch pine (*Pinus sylvestris*). **Understory:** includes white spruce, and eastern white cedar. **Ground cover:** includes reed canary grass, and zig-zag goldenrod.	• Cultural community (CU). • Planted tree cover (Plantation) > 60% (P). • Coniferous trees > 75% of canopy cover (3).
CUT/CUM*	**Cultural Thicket**		

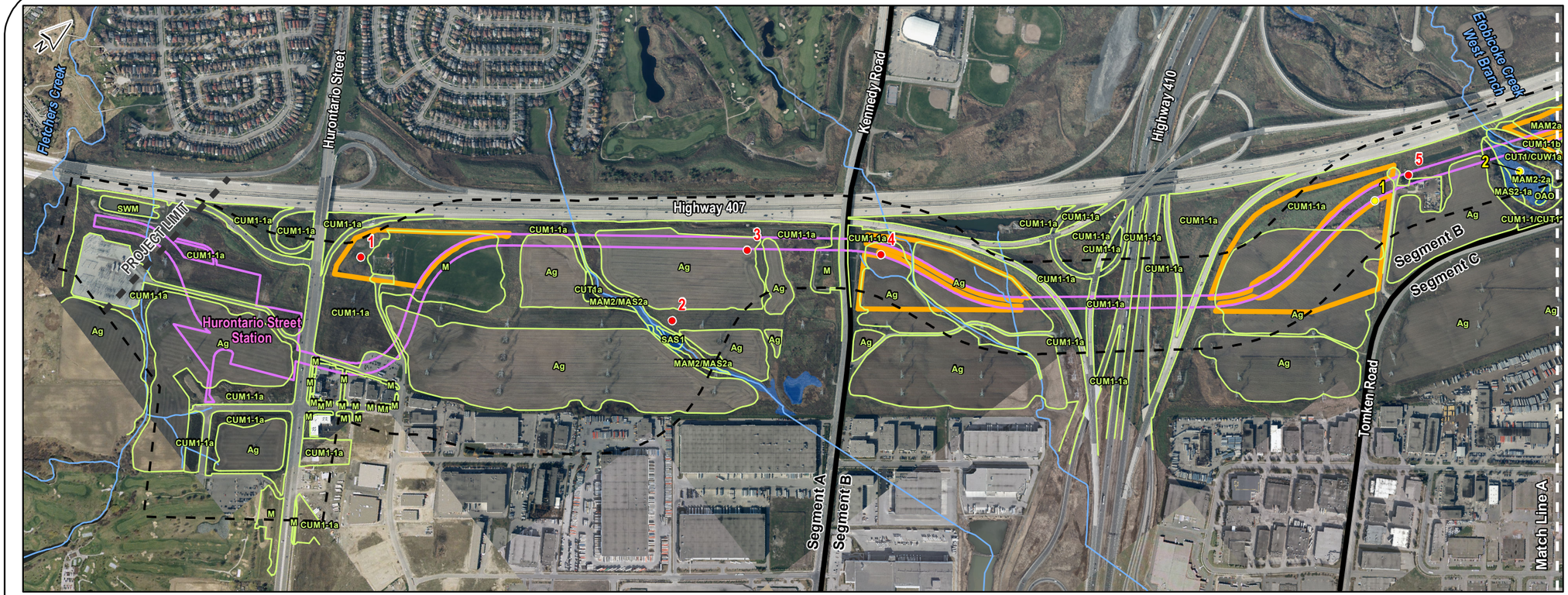
TABLE 3.2: SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

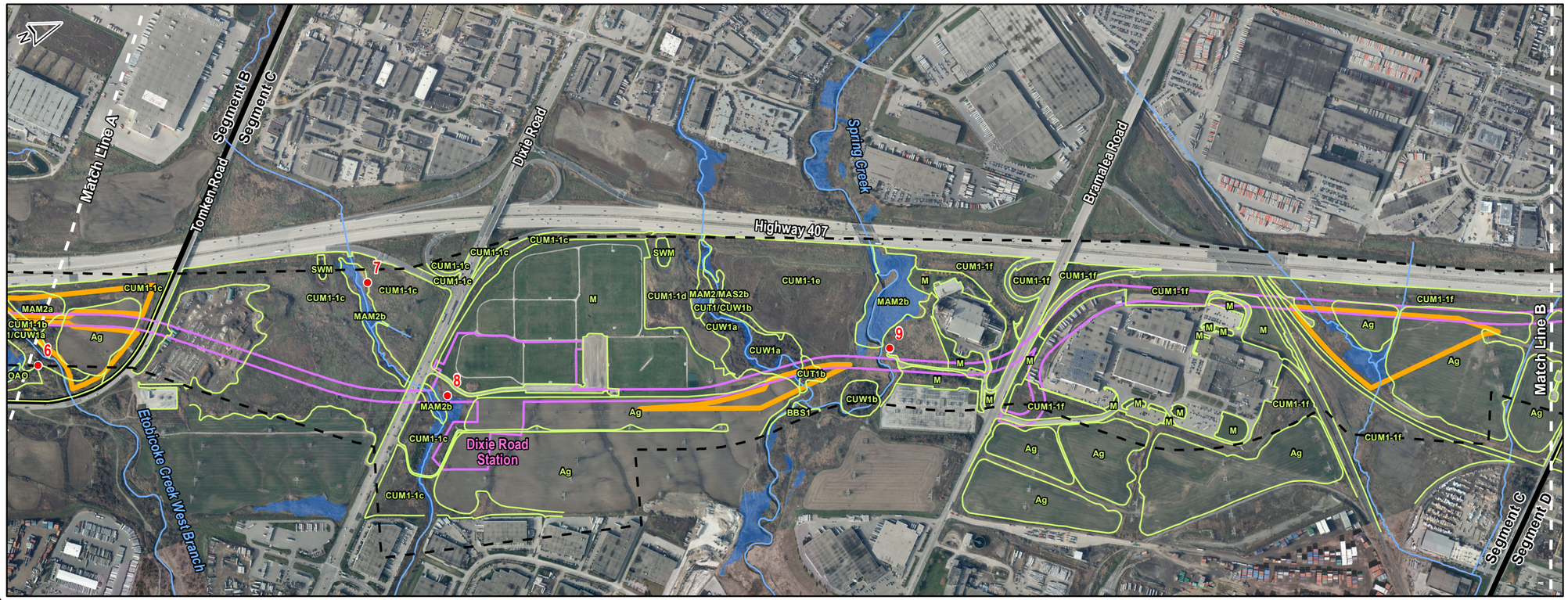
ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
CUM1-1 /CUT1	Mineral Cultural Thicket/Dry-Moist Old Field Meadow	**Canopy:** includes trembling aspen, large-tooth aspen (*Populus grandidentata*), Manitoba maple, silver maple (*Acer saccharinum*), and white elm. **Understory:** includes Manitoba maple, guelder rose, silver aspen (*Populus alba*), large-tooth aspen, common buckthorn, and multiflora rose (*Rosa multiflora*). **Ground cover:** includes bird's-foot trefoil, white sweet clover, wild carrot, wild teasel, tufted vetch, Canada goldenrod, red clover (*Trifolium pratense*), Canada thistle and great burdock (*Arctium lappa*).	• Cultural communities (CU). • Tree cover and shrub cover < 25% (M) / Tree cover <25%; shrub cover >25% (T). • Shrub cover transitioning. • Mineral soil (1). • Community can occur on a wide range of soil regimes (Dry-Moist) (-1).
CUT/CUW*	**Cultural Thicket/Cultural Woodland**		
CUT1/CUW1 (a-b)	Mineral Cultural Thicket/Mineral Cultural Woodland	**Canopy:** includes willow, Manitoba maple, white elm, and English hawthorn. **Understory:** includes black locust, Manitoba maple, tartarian honeysuckle, English hawthorn, common buckthorn, staghorn sumac, Russian olive, white elm and riverbank grape. **Ground cover:** includes orchard grass, wild teasel, Canada goldenrod, tufted vetch (*Vicia cracca*), purple loosestrife (*Lythrum salicaria*), Kentucky bluegrass, and wild carrot.	• Cultural communities (CU). • Tree cover <25%; shrub cover >25% (T)/ 25% < tree cover < 35% (W). • Tree cover and shrub transitioning. • Mineral soil (1).
WETLAND			
SWD	**Deciduous Swamp**		
SWD4-1 (a-c)	Willow Mineral Deciduous Swamp	**Canopy:** includes red oak (*Quercus rubra*), basswood, crack willow (*Salix fragilis*), black walnut, basswood, and Manitoba maple. **Understory:** includes crack willow, Manitoba maple, riverbank grape, common buckthorn, sugar maple, and red oak. **Ground cover:** includes white vervain (*Verbena urticifolia*), spotted touch-me-not, riverbank grape, ostrich fern, white avens, creeping Charlie, Canada goldenrod, wild carrot, awnless brome, bird's-foot trefoil, reed canary grass, and bull thistle (*Cirsium vulgare*).	• Tree or shrub cover >25% and dominated by hydrophytic shrub and tree species (SW). • Deciduous tree cover >75% of canopy cover. • Less common associations of willow and associated hardwoods. Areas where flooding duration is short. Common in floodplains (4). • Willow dominant swamp (-1).
SA	**Shallow Water**		
SAS1	Submerged Shallow Aquatic	Submerged: includes coontail (*Ceratophyllum demersum*).	• Water depth up to 2 m. Standing water always present (SA). • Dominated (>25%) by submerged macrophytes (S1).
MAS	**Shallow Marsh**		
MAS2	Mineral Shallow Marsh	**Emergent Trees/Shrubs:** includes willows (*Salix spp.*), **Ground cover:** dominated by reed canary grass.	• Tree and shrub cover <25%. Hydrophytic emergent machrophyte cover >25% with variable flooding regimes (water depth <2m) (MA). • Water up to 2 m deep (S). • Mineral soil (2).
MAS2-1 (a and b)	Cattail Mineral Shallow Marsh	**Emergent Trees/Shrubs:** includes crack willow, red ash, and common elderberry (*Sambucus nigra* ssp. *canadensis*). **Ground cover:** includes narrow-leaved cattail (*Typha angustifolia*), purple loosestrife, common reed (*Phragmites australis*), wild teasel, spotted touch-me-not, fowl meadow grass (*Glyceria striata*) and reed canary grass.	• Tree and shrub cover <25%. Hydrophytic emergent machrophyte cover >25% with variable flooding regimes (water depth <2m) (MA). • Water up to 2 m deep (S). • Mineral soil (2). • Cattails dominant (-1).

TABLE 3.2: SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC CODE	VEGETATION TYPE	SPECIES ASSOCIATION	COMMUNITY CHARACTERISTICS
MAM	**Meadow Marsh**		
MAM2 (a-d)	Mineral Meadow Marsh	**Emergent Trees/Shrubs:** includes tartarian honeysuckle, common buckthorn, crack willow, and pussy willow (*Salix discolour*). **Ground cover:** includes reed canary grass, narrow-leaved cattail, purple loosestrife, bulrushes (*Scirpus* spp.), Canada goldenrod, Canada thistle, wild teasel, and fowl meadow grass (*Poa palustris*).	• Tree and shrub cover <25% with variable flooding regimes (water depth <2m) (MA). • Flooding seasonal. Species less tolerant of prolonged flooding (M). • Mineral soil (2).
MAM2-2 (a and b)	Reed-canary Grass Mineral Meadow Marsh	**Emergent Trees/Shrubs:** includes willow species. **Ground cover:** includes narrow-leaved cattail, blue vervain (*Verbena hastata*), reed canary grass, common reed, purple loosestrife, New England aster (*Symphyotrichum novae-angliae*), and Dudley's rush (*Juncus dudleyi*).	• Tree and shrub cover <25% with variable flooding regimes (water depth <2m) (MA). • Flooding seasonal. Species less tolerant of prolonged flooding (M). • Mineral soil (2). • Reed-canary grass dominant (-2).
MAM/MAS*	**Meadow Marsh/Shallow Marsh**		
MAM2/MAS2 (a-b)	Meadow Marsh/Shallow Marsh	**Emergent Trees/Shrubs:** includes English hawthorn, chokecherry, tartarian honeysuckle, white elm, and guelder rose. **Ground cover:** includes narrow-leaved cattail, curly-leaf dock (*Rumex crispus*), common reed, purple loosestrife, reed canary grass, bitter nightshade (*Solanum dulcamara*), spotted touch-me-not, and Canada thistle.	• Tree and shrub cover <25% (water depth <2m). Hydrophytic emergent macrophyte cover > 25%. Variable flooding (MA). • Flooding seasonal. Species less tolerant of prolonged flooding (M). • Water up to 2 m deep (S). • Mineral soil (2).
OAO	Open Aquatic		• No macrophyte vegetation, no tree or shrub cover (OAO).
OTHER**			
Planted	**Manicured lawns for sports fields, hedgerows, etc.**		
M	Manicured grasses and planted shrubs and/or trees	Areas where large expanses of grass/shrubs/trees are maintained and/or planted. **Trees/shrubs:** includes black walnut, white elm, red-osier dogwood, chokecherry, Manitoba maple and red ash.	
SWM	Stormwater Management Pond	Bermed areas surrounding pond typically planted with shrub / tree species. Ground flora often consists of disturbance tolerant species immigrated from the adjacent landscape. Water's edge typically surrounded by common reed and cattails.	
Ag	Agricultural fields	Large agricultural fields planted with corn (*Zea mays*), soybean (*Glycine max*), etc.	

*Combined communities typically with undefined boundaries. / **Not identified by the ELC.





LEGEND

- Study Area
- Impact Assessment Corridor
- Protected Site
- Unevaluated Wetland
- Watercourse
- Anuran Call Monitoring Station
- Breeding Bird Point Count Station

Vegetation Communities

- Vegetation Community Boundary

Ag	Agricultural
BBS1	Mineral Shrub Beach/Bar Ecosite
CUM1-1 (s-t)	Dry-Moist Old Field Meadow Type
CUM1-1/CUT1 (s-b)	Dry-Moist Old Field Meadow Type/Mineral Cultural Thicket Ecosite
CUT1 (s-b)	Mineral Cultural Thicket Ecosite
CUT1/CUW1	Mineral Cultural Thicket Ecosite/Mineral Cultural Woodland Ecosite
CUW1 (s-b)	Mineral Cultural Woodland Ecosite
M	Manicured
MAM2 (s-b)	Mineral Meadow Marsh Ecosite
MAM2/MAS2 (s-b)	Mineral Meadow Marsh/Mineral Shallow Marsh Ecosite
MAM2-2a	Reed-canary Grass Mineral Meadow Marsh Type
MAS2-1a	Cattail Mineral Shallow Marsh Type
OAO	Open Aquatic
SAS1	Submerged Shallow Aquatic Ecosite
SWM	Storm Water Pond

Data Sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry (LIO).

200 100 0 200 Metres

407 TRANSITWAY WEST - NATURAL HERITAGE

LGL LIMITED
environmental research associates

Project:	TA8558	**Figure:**	3.2a
Date:	June, 2018	**Prepared By:**	MWF
Scale:	1 : 14,000	**Checked By:**	NMF

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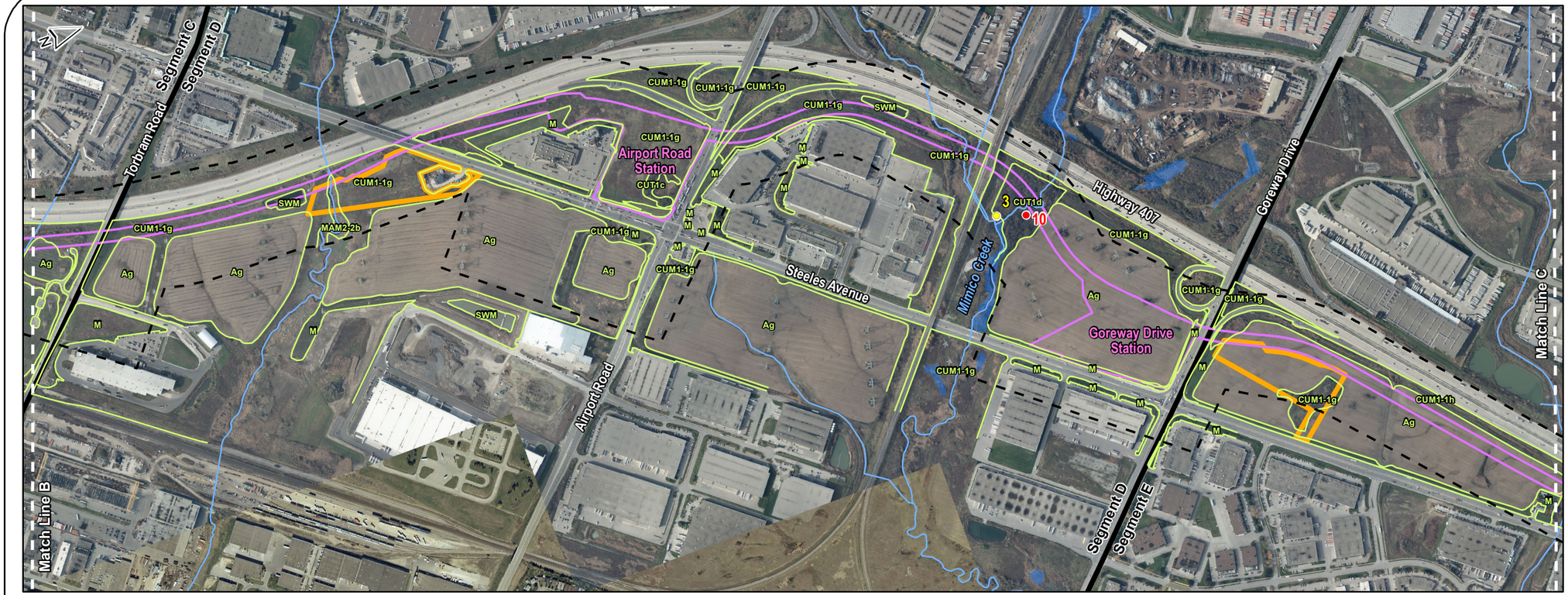

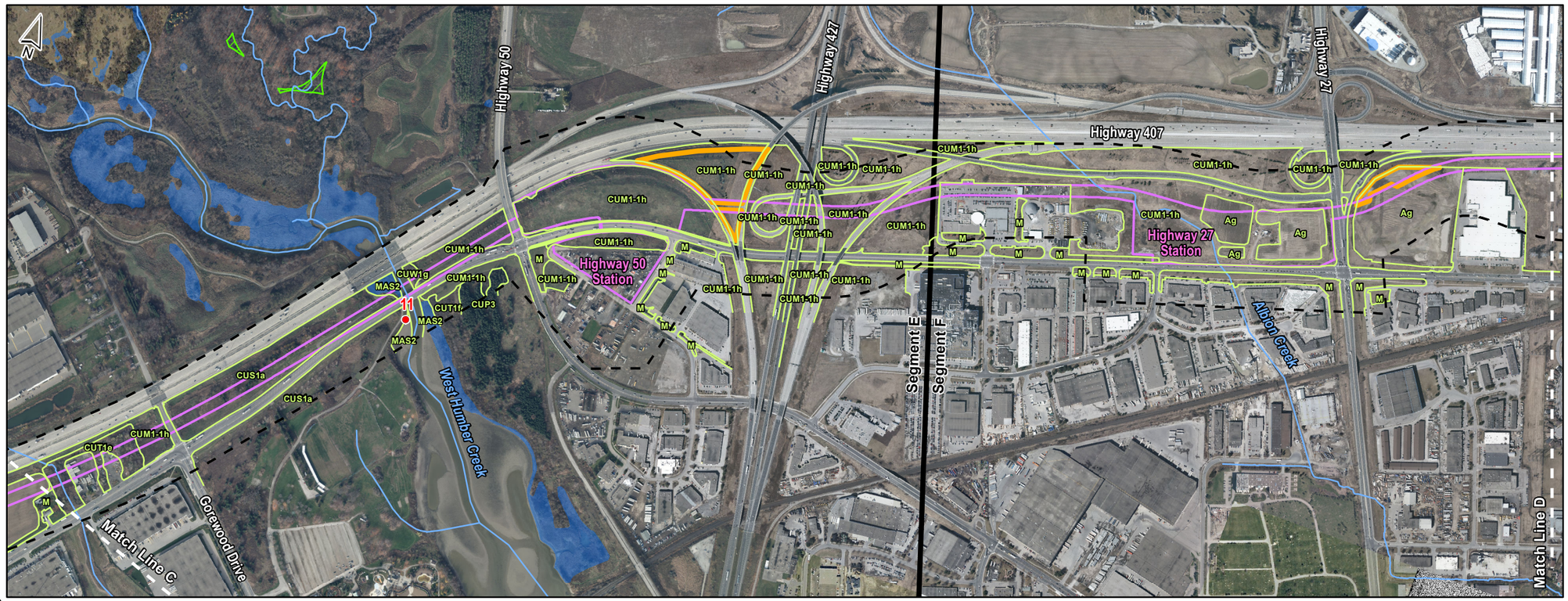

LEGEND

- Study Area
- Impact Assessment Corridor
- Protected Site
- Interior Forest Habitat (100 m From Edge)
- Unevaluated Wetland
- Watercourse
- Anuran Call Monitoring Station
- Breeding Bird Point Count Station

Vegetation Communities

- Vegetation Community Boundary

Ag	Agricultural
CUP3	Coniferous Plantations
CUS1a	Mineral Cultural Savannah Ecosite
CUM1-1 (g,h)	Dry-Moist Old Field Meadow Type
CUT1 (c-f)	Mineral Cultural Thicket Ecosite
CUW1g	Mineral Cultural Woodland Ecosite
M	Manicured
MAM2-2b	Reed-canary Grass Mineral Meadow Marsh Type
MAS2	Mineral Shallow Marsh Ecosite
SWM	Storm Water Pond

Data Sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry (LIO).

200 100 0 200 Metres

407 TRANSITWAY WEST - NATURAL HERITAGE

LGL LIMITED
environmental research associates

Project:	TA8558	**Figure:**	3.2b
Date:	June, 2018	**Prepared By:**	MWF
Scale:	1 : 14,000	**Checked By:**	NMF

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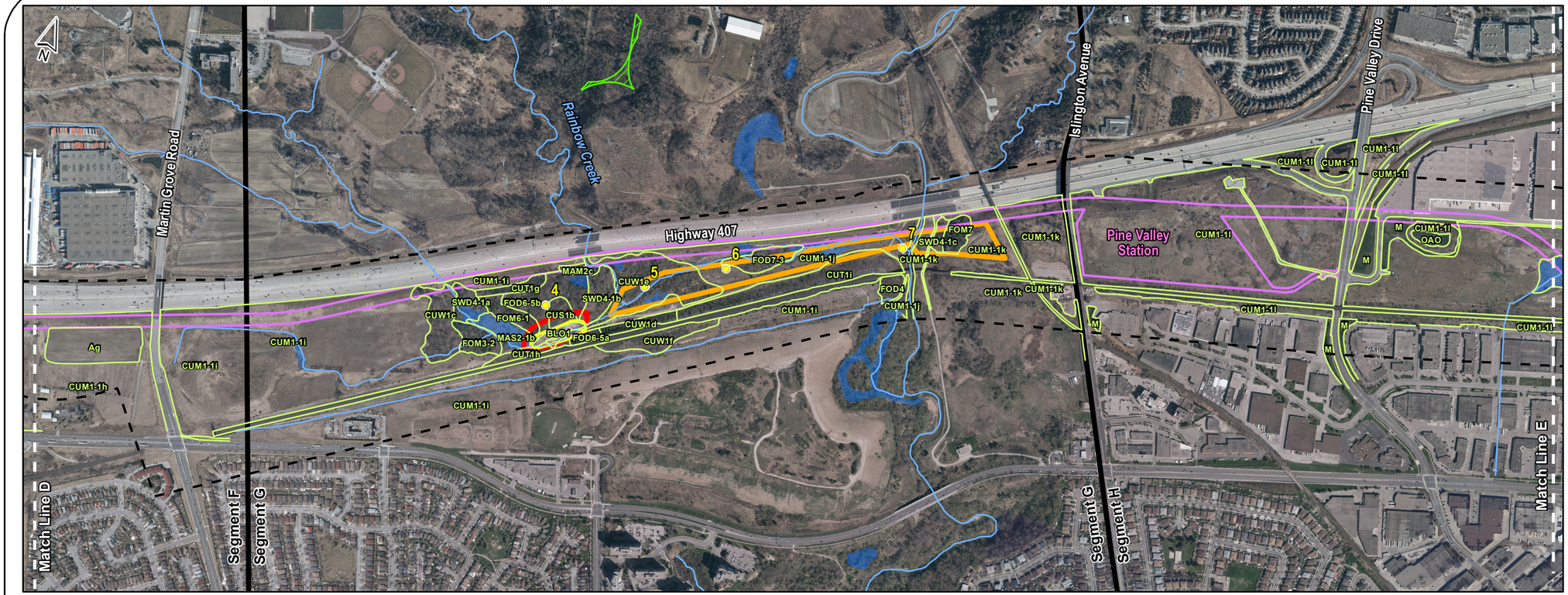

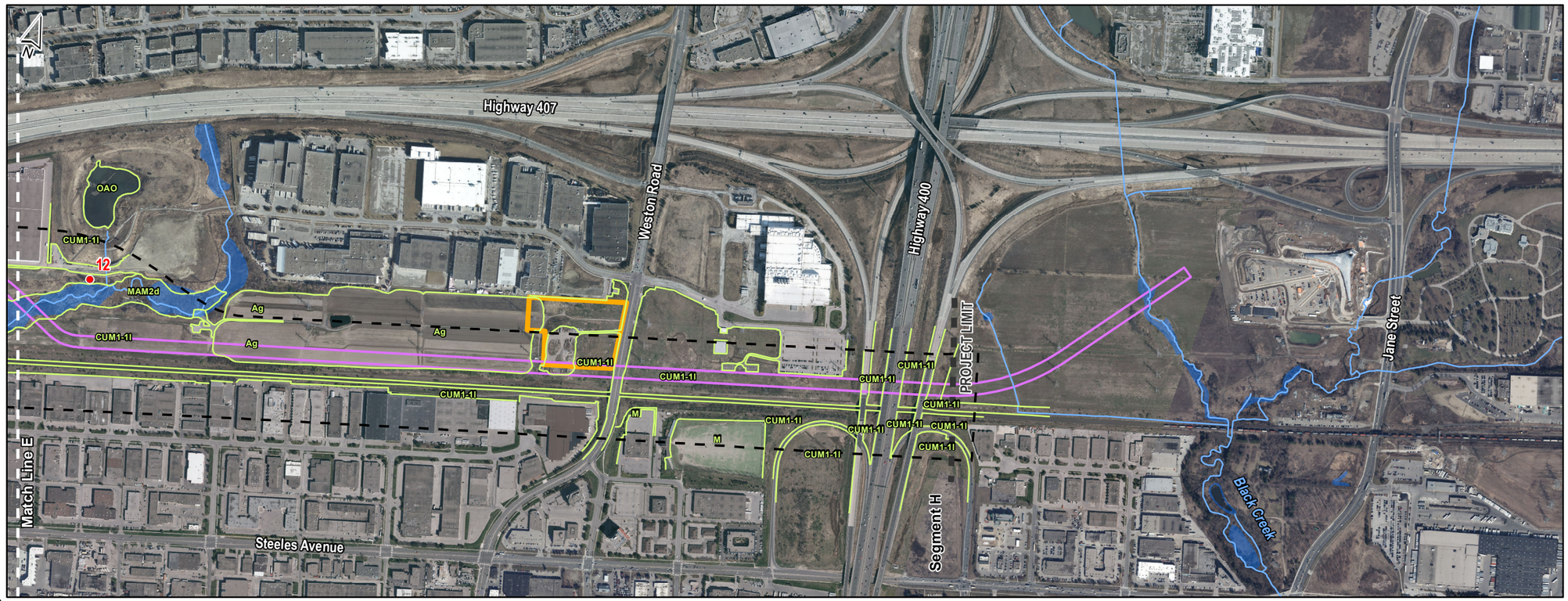

LEGEND

- Study Area
- Impact Assessment Corridor
- Protected Site
- Interior Forest Habitat (100 m From Edge)
- Unevaluated Wetland
- Area of Natural and Scientific Interest (Woodbridge Pleistocene Cut)
- Environmentally Significant Area (Woodbridge Cut)
- Watercourse
- Anuran Call Monitoring Station
- Breeding Bird Point Count Station

Vegetation Communities

- Vegetation Community Boundary

Ag	Agricultural
BLO1	Calcareous Fine Mineral Open Bluff Ecosite
CUM1-1 (h-l)	Dry-Moist Old Field Meadow Type
CUS1b	Mineral Cultural Savannah Ecosite
CUT1 (c-i)	Mineral Cultural Thicket Ecosite
CUW1 (c-i)	Mineral Cultural Woodland Ecosite
FOD4	Dry-Fresh Deciduous Forest Ecosite
FOD6-5 (b-h)	Fresh-Moist Sugar Maple-Hardwood Deciduous Forest Type
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest Type
FOM3-2	Dry-Fresh Sugar Maple-Hemlock Mixed Forest Type
FOM6-1	Fresh-Moist Sugar Maple-Hemlock Mixed Forest Type
FOM7	Fresh-Moist White Cedar-Hardwood Mixed Forest Ecosite
M	Manicured
MAM2 (e-d)	Mineral Meadow Marsh Ecosite
MAS2-1b	Cattail Mineral Shallow Marsh Type
OAO	Open Aquatic
SWD4-1 (b-c)	Willow Mineral Deciduous Swamp Type

Data Sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry (LIO), Toronto Region Conservation Authority.

200 100 0 200 Metres

407 TRANSITWAY WEST - NATURAL HERITAGE

LGL LIMITED
environmental research associates

Project:	TA8558	**Figure:**	3.2c
Date:	June, 2018	**Prepared By:**	MWF
Scale:	1 : 14,000	**Checked By:**	NMF

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3.1.7. Wildlife and Wildlife Habitat

An investigation of the wildlife and wildlife habitat found in the study area was carried out using secondary source information, air photo interpretation and field surveys. The TRCA, CVC, MNRF, Aurora District Office, and Ontario Nature were contacted to request fauna element occurrence data. Information concerning wildlife species at risk previously recorded within the study area limits was obtained from the NHIC, TRCA, Breeding Bird Atlas, and from the MNRF, Aurora District Office in a letter dated February 4, 2016 and an email dated January 10, 2018. Data provided by MNRF and TRCA provided element occurrence records for an array of wildlife species, including species at risk. CVC also provided element occurrence records for fauna; however, the records provided were all located outside of the study area and consequently are not included. Ontario Nature provided reptile and amphibian data in an email dated November 24, 2015. More general information relating to wildlife and wildlife habitat was obtained following a review of published and non-published sources, including avian data obtained from Bird Studies Canada.

The overall study area for the initial wildlife and wildlife habitat secondary source existing conditions investigation included all habitats within a one-kilometre-wide corridor centred along 407 ETR within the study area. Detailed field investigations to document wildlife and wildlife habitat were conducted by LGL in late spring/early summer of 2016 and focused on the facility footprint, including the proposed preferred Transitway alignments/station locations and adjacent lands up to 120 m (north and south) from the future infrastructure footprint (see **Figure 3.2a, 3.2b and 3.2c**), all located south of the 407 ETR. Surveys conducted included targeted anuran (frog and toad) and breeding bird surveys following provincially-recognized protocols such as the Ontario Marsh Monitoring Program and the Ontario Breeding Bird Atlas Protocol. Incidental observations of wildlife were also recorded during all field investigations.

WILDLIFE HABITAT

There are many natural heritage features located within the study area between west of Hurontario Street and east of Highway 400, in particular where watercourses/valleylands are found. Valleylands associated with Etobicoke Creek West Branch (E5), West Humber River (H1), Mimico Creek (M7), Rainbow Creek (H6), and the Lower Humber River (H7) make up the highest quality natural heritage features in the study area and provide important north-south movement corridors for wildlife. These north-south naturalized linkages provide increased opportunity for wildlife utilization of habitats within and adjacent to the study area. Interspaced between these larger more contiguous natural heritage features are numerous open-country habitat types such as cultural meadows, thickets, woodlands and savannahs, agricultural lands and several aquatic habitat types (meadow marsh, shallow marsh, deciduous swamp, shallow aquatic and open aquatic).

Overall, larger and more contiguous natural areas within the study area are restricted to several areas but, where present, support a moderate diversity of wildlife species. Important habitat connectivity is achieved by a number of north-south running valleylands (Etobicoke Creek West Branch (E5), West Humber River (H1), Mimico Creek (M7), Rainbow Creek (H6), and the Lower Humber River (H7)) as described above, as well as the valleylands of the other watercourses located within the study area (including Tributary of Fletchers Creek (C1), Tributary of Spring Creek (E7), Spring Creek (E8), and Albion Creek (H2) and their tributaries). However, outside of these valleylands, the landscape is highly disturbed and supports limited 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 preliminary analysis of the woodlands was undertaken to determine the location and size of interior forest habitat within the overall study area, which is generally defined as forested cover at least 100 m from non-forested land cover. For the initial overall study area, air photo interpretation was completed and data from Land Information Ontario was analyzed to delineate forested vegetation communities. Interior forest habitat is limited to two small areas, both of which are located north of 407 ETR beyond the limits of the study area for the detailed field investigations, including forested areas associated with the West Humber River valleyland (north of 407 ETR and west of Highway 50) and the Lower Humber River valleyland (north of 407 ETR and west of Islington Avenue). No interior forest habitat was identified within the detailed field investigation study area; the lack of interior forest habitat illustrates the highly disturbed nature of the forested areas within the study area. However, a specialized assemblage of wildlife species (e.g., interior forest bird species) may be expected to use and rely on this habitat type.

WILDLIFE SPECIES

A list of wildlife recorded within habitats along the 407 Transitway corridor by LGL and from secondary source data is presented in **Table 3.3**. A total of 91 wildlife species have been recorded from secondary source data and during LGL's field observations including ten herpetofauna, 67 birds and 14 mammals. Based on LGL's field observations, 60 of the 91 wildlife species could be verified including two herpetofauna, 48 birds and 10 mammals. The majority of these recordings came from identification (through calls and sightings) of bird species with more modest numbers of herpetofauna and mammal species identified. Detailed records of wildlife species which have been documented within, or in the vicinity of, the study area, have been identified through several secondary data sources and are discussed below.

TABLE 3.3: 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	LGL1	SECONDARY SOURCE[2]
Herpetofauna	*Anaxyrus americanus*	American Toad				L4	*	*
	Pseudacris triseriata	Western Chorus Frog	THR	-		L2		*
	Lithobates sylvatica	Wood Frog				L2		*
	Lithobates pipiens	Northern Leopard Frog				L3		*
	Lithobates clamitans	Green Frog				L4	*	*
	Plethodon cinereus	Red-backed Salamander			FWCA(P)	L3		*
	Storeria dekayi	Brownsnake				L4		*
	Thamnophis sirtalis sirtalis	Eastern Gartersnake				L4		*
	Emydoidea blandingii	Blanding's Turtle	THR	THR	FWCA(P)	L2		*
	Chelydra serpentina	Snapping Turtle	SC	SC	FWCA(P)	L2		*
Birds	*Aix sponsa*	Wood Duck			MBCA	L3		*
	Anas platyrhynchos	Mallard			MBCA	L5	*	
	Maleagris gallopavo	Wild Turkey			FWCA(P)	L2		*
	Accipiter cooperii	Cooper's Hawk			FWCA(P)	L4	*	*
	Buteo jamaicensis	Red-tailed Hawk			FWCA(P)	L5	*	
	Falco sparverius	American Kestrel				L4		*
	Charadrius vociferus	Killdeer			MBCA	L5	*	*
	Actitis macularius	Spotted Sandpiper			MBCA	L4	*	*
	Scolopax minor	American Woodcock				L3	*	*
	Otus asio	Eastern Screech-owl			FWCA(P)	L4		*
	Chaetura pelagica	Chimney Swift	THR	THR	MBCA	L5		*
	Columba livia	Rock Dove				L5	*	
	Zenaida macroura	Mourning Dove			MBCA	L5	*	
	Picoides pubescens	Downy Woodpecker			MBCA	L5	*	
	Picoides villosus	Hairy Woodpecker			MBCA	L4		*

TABLE 3.3: 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	LGL1	SECONDARY SOURCE[2]
	Colaptes auratus	Northern Flicker			MBCA	L4	*	*
	Tyrannus tyrannus	Eastern Kingbird			MBCA	L5	*	*
	Myiarchus crinitus	Great-crested Flycatcher			MBCA	L4	*	*
	Contopus virens	Eastern Wood Pewee	-	SC	MBCA	L4	*	*
	Empidonax traillii	Willow Flycatcher			MBCA	L4	*	*
	Vireo gilvus	Warbling Vireo			MBCA	L5	*	
	Vireo olivaceus	Red-eyed Vireo			MBCA	INT/L4		*
	Cyanocitta cristata	Blue Jay			FWCA(P)	L5	*	
	Ceryle alcyon	Belted Kingfisher			MBCA	L4		*
	Coccyzus erythropthalmus	Black-billed Cuckoo			MBCA	L3		*
	Polioptila caerulea	Blue-grey Gnatcatcher			MBCA	L4		*
	Empidonax minimus	Least Flycatcher			MBCA	L3		*
	Sayornis phoebe	Eastern Phoebe			MBCA	L4	*	*
	Cyanocitta cristata	Blue Jay			FWCA (P)	L5	*	
	Corvus brachyrhynchos	American Crow			MBCA	L5	*	
	Eremophila alpestris	Horned Lark			MBCA	L3	*	*
	Stelgidoptery x serripennis	Northern Rough-winged Swallow			MBCA	L4	*	*
	Hirundo rustica	Barn Swallow		THR	MBCA	L3	*	*
	Tachycineta bicolor	Tree Swallow			MBCA	L4	*	*
	Petrochelidon pyrrhonota	Cliff Swallow			MBCA	L4	*	
	Poecile atricapillus	Black-capped Chickadee			MBCA	L5	*	*
	Sitta carolinensis	White-breasted Nuthatch			MBCA	SWH/L4		*
	Hylocichla mustelina	Wood Thrush	-	SC	MBCA	L4		*
	Turdus migratorius	American Robin			MBCA	L5	*	
	Dumetella carolinensis	Gray Catbird			MBCA	L4	*	*
	Mimus polyglottos	Northern Mockingbird			MBCA	L4	*	*

TABLE 3.3: 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	LGL1	SECONDARY SOURCE[2]
	Sturnus vulgaris	European Starling				L5	*	
	Bombycilla garrulus	Cedar Waxwing			MBCA	L5	*	
	Dendroica petechia	Yellow Warbler			MBCA	L5	*	
	Geothlypis philadelphia	Mourning Warbler			MBCA	L4	*	*
	Seiurus aurocapilla	Ovenbird			MBCA	SWH/INT/L3		*
	Setophaga ruticilla	American Redstart			MBCA	SWH/L3	*	*
	Geothlypis trichas	Common Yellowthroat			MBCA	L4	*	
	Wilsonia citrina	Hooded Warbler	THR	-	MBCA	L2		*
	Spizella passerina	Chipping Sparrow			MBCA	L5	*	
	Spizella pusilla	Field Sparrow			MBCA	L3		*
	Passerculus sanwichensis	Savannah Sparrow			MBCA	SWH/L4	*	*
	Melospiza georgiana	Swamp Sparrow			MBCA	L4	*	*
	Melospica melodia	Song Sparrow			MBCA	L5	*	
	Cardinalis cardinalis	Northern Cardinal			MBCA	L5	*	
	Pheucticus ludovicianus	Rose-breasted Grosbeak			MBCA	L4		*
	Passerina cyanea	Indigo Bunting			MBCA	L4	*	*
	Dolichonyx oryzivorus	Bobolink	THR	THR	MBCA	L3		*
	Agelaius phoeniceus	Red-winged Blackbird				L5	*	
	Sturnella magna	Eastern Meadowlark	THR	THR	MBCA	L4		*
	Quiscalus quiscula	Common Grackle				L5	*	
	Molothrus ater	Brown-headed Cowbird				L5	*	
	Icterus spurius	Orchard Oriole			MBCA	L5	*	*
	Icterus galbula	Baltimore Oriole			MBCA	L5	*	
	Carpodacus mexicanus	House Finch			MBCA	L5	*	
	Carduelis tristis	American Goldfinch			MBCA	L5	*	

TABLE 3.3: 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	LGL1	SECONDARY SOURCE[2]
	Passer domesticus	House Sparrow				L5	*	
Mammals	*Blarina brevicauda*	N. Short-tailed Shrew			FWCA(P)	-	*	
	Tamias striatus	Eastern Chipmunk			FWCA(P)	L4	*	*
	Sylvilagus floridanus	Eastern Cottontail			FWCA(G)	L4	*	*
	Marmota monax	Groundhog				L4		*
	Sciurus carolinensis	Eastern Gray Squirrel			FWCA(G)	L4	*	
	Tamiasciurus hudsonicus	Red Squirrel			FWCA(F)	L4	*	
	Castor canadensis	Beaver			FWCA(F)	L3		*
	Microtus pennsylvanicus	Meadow Vole				L4	*	
	Neovison vison	American Mink			FWCA(F)	L3		*
	Procyon lotor	Northern Racoon			FWCA(F)	L5	*	
	Canis latrans	Coyote			FWCA(F)	L4	*	
	Ondatra zibethica	Muskrat			FWCA(F)	L4		*
	Mephitis mephitis	Striped Skunk			FWCA(F)	L5	*	
	Odocoileus virginianus	White-tailed Deer			FWCA(G)	L4	*	*

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 2016).
[2]Species identified by secondary source data, including Ontario Reptile and Amphibian Atlas and TRCA.

Other:
Significant Wildlife Habitat Technical Guide:
SWH – Area Sensitive Species
INT - Interior Species
TRCA – Toronto and Region Conservation Authority L Rank (1-5) – Sensitive Species include those ranked as L1 to L3.
Legal Status:
MBCA - *Migratory Birds Convention Act*
ESA - E*ndangered Species Act, 2007*
SARA - *Species at Risk Act*
FWCA - *Fish and Wildlife Conservation Act*
(P) Protected Species (G) Game species (F) Furbearing mammals

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. Twelve 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 (see anuran call monitoring stations in **Figures 3.2a to 3.2c**). Anuran surveys were conducted on two separate nights during the spring and summer of 2016. The surveys began at one half hour after sunset and ended prior to midnight and were conducted during appropriate weather conditions. Surveys were completed during periods of peak anuran breeding activity and vocalization. Anuran breeding evidence was documented for two species during the 2016 surveys. Vocalizing male American Toad (*Anaxyrus americanus*) and Green Frog (*Lithobates clamitans*) were noted within the study area, or in the immediate vicinity of the study area. Overall, amphibian breeding evidence observed during 2016 was limited to only two aquatic habitats including the Tributary of Etobicoke Creek West Branch (south of 407 ETR, east of Tomken Road) and Mimico Creek (south of 407 ETR, west of Goreway Drive).

Element occurrence records for nine of the herpetofauna species previously recorded in the vicinity of the study area were obtained from the Ontario Reptile and Amphibian Atlas and the TRCA. Data from the Ontario Reptile and Amphibian Atlas indicated records for three species including Eastern Gartersnake (*Thamnophis sirtalis sirtalis*), American Toad (*Anaxyrus americanus*) and Green Frog (*Lithobates clamitans*) (Ontario Nature 2015). Data from the TRCA included records for nine species including American Toad, Green Frog, and Eastern Gartersnake (the three species listed above), as well as Northern Leopard Frog (*Lithobates pipiens*), Western Chorus Frog (*Pseudacris triseriata*), Wood Frog (*Lithobates sylvaticus*), Red-backed Salamander (*Plethodon cinereus*), Snapping Turtle (*Chelydra serpentina*), and Brownsnake (*Storeria dekayi*).

As noted above, two of the total of ten herpetofauna species (American Toad and Green Frog) were identified by LGL during the 2016 field investigations. No other/additional herpetofauna species were identified during the 2016 field investigations. Other reptile and amphibian species are expected to be found within the study area; though, an assemblage that is generally considered tolerant of anthropogenic influences is expected to be present within the lands examined.

Three species at risk herpetofauna (Western Chorus Frog, Blanding's Turtle (*Emydoidea blandingii*) and Snapping Turtle) were identified by secondary source element occurrence records as occurring within the vicinity of the study area, although none of these species were confirmed during LGL's 2016 surveys (see below for further details on species at risk). Three herpetofauna species (Red-backed Salamander, Snapping Turtle and Blanding's Turtle) identified by secondary source element occurrence records as occurring within the vicinity of the study area are protected under the *Fish and Wildlife Conservation Act* (FWCA) (see **Table 3.3**), although none of these species were confirmed during LGL's 2016 surveys. Six species considered sensitive species (as defined by TRCA L Rank: 1-3) were recorded in the study area through secondary source data (see **Table 3.3**).

Birds

Breeding bird surveys were conducted by LGL on a number of dates during the 2016 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 published by Bird Studies Canada (Cadman et al., 2007). Locations of the seven breeding bird point count stations are shown on **Figures 3.2a to 3.2c**. 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 3.3**.

Forty-two bird species were identified as previously recorded in the immediate vicinity of the study area based on data provided by the TRCA (see **Table 3.3**). A total of 112 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 (Cadman *et al.* 2007). 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 TRCA data is considered more representative of the habitat types found within the study area (and these species have been included in **Table 3.3**). Furthermore, LGL's 2016 survey results provided additional data on the bird assemblage found within the study area (see below and **Table 3.3**).

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 34 species of birds. An additional 14 bird species were recorded by LGL within the study area; however due to a lack of breeding evidence, these additional observations are treated as incidental (see **Table 3.3**). Breeding evidence was confirmed in four species and suspected/probable in 21 species. An additional nine species were identified as having the potential to breed within the study area. Confirmed breeding by bird species was generally documented based on adults returning to nests, typically under bridge structures associated with 407 ETR. Species confirmed to be breeding include Cliff Swallow (*Petrochelidon pyrrhonota*), European Starling (*Sturnus vulgaris*), Barn Swallow (*Hirundo rustica*) and Rock Dove (*Columba livia*). A number of species (21 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*), Tree Swallow (*Tachycineta bicolor*), Eastern Kingbird (*Tyrannus tyrannus*) 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.

Seven species at risk birds were identified by secondary source data and two of these species (Barn Swallow and Eastern Wood Pewee) were confirmed during LGL's 2016 surveys (see below for further details on species at risk). There are also multiple species that are considered area-sensitive and/or interior species according to the Significant Wildlife Habitat Technical Guide (MNR 2000) (see **Table 3.3**). A number of bird species identified within the study area are protected under the *Migratory Birds Convention Act* (MBCA) and/or the FWCA (see **Table 3.3**). Twelve bird species which are considered sensitive species (as defined by TRCA L Rank: 1-3) were recorded in the study area (see **Table 3.3**).

Mammals

Ten mammal species were identified during LGL's 2016 field investigations in the study area (see **Table 3.3**). Northern racoon (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*) tracks were commonly identified along the roadside and watercourse banks, while eastern chipmunk (*Tamias striatus*), eastern gray squirrel (*Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*) and eastern cottontail (*Sylvilagus floridanus*) were observed across a variety of habitats found within the study area. Several road-killed striped skunk (*Mephitis mephitis*) and northern racoon were identified during field investigations. Northern short-tailed shrew (*Blarina brevicauda*) and meadow vole (*Microtus pennsylvanicus*) were identified in meadow communities within the study area. The mammal species documented by LGL represent an assemblage that readily utilizes human influenced landscapes.

Seven mammal species (including four not identified during LGL's 2016 field investigations: groundhog (*Marmota monax)*; North American beaver (*Castor Canadensis*); American mink (*Neovison vison*); and, muskrat (*Ondatra zibethicus*)) have been identified within the study area based on records received from TRCA. Species recorded by TRCA include these four species as well as eastern chipmunk, eastern cottontail, and white-tailed deer. Based on the habitat types present, additional mammal species which prefer open-county/agricultural, thicket, deciduous forest, coniferous forest, mixed forest, wetland, aquatic and anthropogenic habitats have the potential to be found within the study area. Generally, the mammal species expected within the study area represent an assemblage that readily utilizes human influenced landscapes.

None of the mammal species identified in the study area (by LGL's field investigations and by TRCA element occurrence data) are designated as species at risk. All of the mammal species identified within the study area (by LGL's field investigations and by TRCA element occurrence data) are protected under the FWCA with the exception of groundhog and meadow vole. Two mammal species which are considered sensitive species (as defined by TRCA L Rank: 1-3) were recorded in the study area (see **Table 3.3**).

SPECIES AT RISK

A total of 14 wildlife species at risk have been recorded within the vicinity of the study area based on secondary source data and an additional two wildlife species at risk have been identified as having the potential to be found within the study area (little brown myotis and northern myotis). These secondary source records have been attributed to several data sources as described below. Two species at risk (Barn Swallow and Eastern Wood Pewee) were confirmed within the study area during LGL's 2016 field investigations.

A review of the NHIC database (MNRF 2015) for rare species records indicated four species at risk (including Northern Bobwhite (*Colinus virginianus)*, Eastern Meadowlark (*Sturnella magna)*, Bobolink (*Dolichonyx oryzivorus*) and Snapping Turtle (*Chelydra serpentine*)) which have been previously identified in the vicinity of the study area**.**

Wildlife occurrence record data received from the TRCA (2016) included records for 10 species at risk (three of which were identified in the NHIC data), including eight bird species (Chimney Swift (*Chaetura pelagica)*, Eastern Wood Pewee (*Contopus virens*), Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Hooded Warbler (*Wilsonia citrina*), Wood Thrush (*Hylocichla mustelina*), Bobolink and Eastern Meadowlark) and two herpetofauna species (Western Chorus Frog (*Pseudacris triseriata*) and Snapping Turtle).

Species at risk data was also received from the MNRF, Aurora District Office on February 4, 2016. MNRF data describes seven wildlife species at risk which have been previously recorded within the vicinity of the study area (including Barn Swallow, Eastern Meadowlark, Eastern Wood Pewee, Bobolink, Wood Thrush, Snapping Turtle and Monarch (*Danaus plexippus*)) and three additional wildlife species at risk that have the potential to be present within the study area including Bank Swallow (already mentioned above), little brown myotis (*Myotis lucifugus*), and northern myotis (*Myotis septentrionalis*). Additional species at risk data was received from MNRF, Aurora District Office on January 10, 2018. MNRF noted that one additional wildlife species at risk (Blanding's Turtle) has been recorded within the vicinity of the study area.

Breeding Bird Atlas data collected in the vicinity of the study area revealed records of several species at risk birds (Cadman *et al.* 2007). 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 or were not identified within the actual limits of the study area. A total of nine bird species at risk were recorded based on records from the Breeding Bird Atlas, including Common Nighthawk (*Chordeiles minor*) and eight others already identified above (Chimney Swift, Eastern Wood Pewee, Bank Sallow, Barn Swallow, Hooded Warbler, Wood Thrush, Bobolink and Eastern Meadowlark).

As noted above, two species at risk (Barn Swallow and Eastern Wood Pewee) were identified at several locations across the study area by LGL during the 2016 field investigation. Based on the timing of the observations (i.e. during the breeding bird season), it is assumed that these two species are breeding within or near the study area. In fact, two Barn Swallow nesting colonies were identified near the study area (details below).

Each of the 16 species identified above, their respective legal status, biological requirements, habitat suitability of the study area, likelihood of presence within the study area and survey results (if completed) are discussed below.

Western Chorus Frog

Natural heritage data provided by TRCA contained five records of Western Chorus Frog from several locations across the study area, with occurrence dates ranging from 1997 to 2014. The Western Chorus Frog (Great Lakes/St. Lawrence Population) is regulated as 'Threatened' under the SARA, but the species is not regulated 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 (with the exception of the CNR/CPR lands), a criterion that would trigger a federal permit if the species was identified within the study area. Western Chorus Frog were not identified during LGL's 2016 amphibian surveys; however, given the timing of amphibian surveys (May and June), Western Chorus Frog were likely to have already finished breeding and consequently were unlikely to be detected. Field investigations in spring/early summer of 2016 identified potentially suitable habitat for this species associated with open aquatic habitat types across the study area including marshes, meadows (and other open-country environments) and swales.

Blanding's Turtle

Rare species records provided by the MNRF, Aurora District Office (2018) identified Blanding's Turtle as a species that has previously been recorded within the vicinity of the study area; however, no details as to the location(s) or date(s) of the record(s) were provided. Blanding's Turtle is regulated as 'Threatened' under the ESA and the SARA. Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of aquatic vegetation. Blanding's Turtles are also known to make long overland movements to seek egg laying sites or to access new aquatic habiats. No habitat considered suitable to support this species was identified within the study area. No incidental observations of Blanding's Turtle were recorded during LGL's 2016 field investigations; although no targeted surveys for this species were conducted.

Snapping Turtle

The NHIC database contained a single record of Snapping Turtle (from 2007) which was located north of the intersection of 407 ETR and Clareville Conservation Road. TRCA data contained a record from 2011 which was located north of 407 ETR between Martin Grove Road and Islington Avenue. MNRF confirmed that Snapping Turtle have been recorded in the study area, although the record location is unknown. The Snapping Turtle is listed as 'Special Concern' under the ESA and SARA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. Snapping Turtle is generally associated with aquatic settings such as lakes, ponds, bays and inlets. This is a highly aquatic species but 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 in spring/early summer of 2016 identified potentially suitable habitat for this species, including a variety of aquatic habitats identified across the study area. However, no Snapping Turtles were identified during LGL's 2016 field investigations.

Northern Bobwhite

The Northern Bobwhite is regulated as 'Endangered' under the ESA and SARA. A total of nine NHIC element occurrence records were identified from across the study area for Northern Bobwhite (all dated from 1905). Northern Bobwhite is typically found in agricultural fields, grasslands and open country communities. The occurrence records for this species are dated from 1905 and are consequently considered historic in nature. Formerly widespread across the southern portion of the province, the Northern Bobwhite is now only known from a few scattered sites in extreme southwestern Ontario, namely Walpole Island (MNRF 2015). Northern Bobwhite is not expected to live in or near the study area. No Northern Bobwhite were identified during LGL's 2016 field investigations.

Common Nighthawk

Records for this species were present in Breeding Bird Atlas data (dated between 2001-2005) although record locations are unknown. 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 a wide range of open, vegetation-free 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 (e.g. parking lots, parkland and rooftops) which have the potential to support Common Nighthawk, were identified across much of the study area. However, no Common Nighthawks were observed during LGL's 2016 field investigations.

Hooded Warbler

Natural heritage data provided by TRCA contained a single record of Hooded Warbler in the immediate vicinity of the Woodbridge Pleistocene Cut Area of Natural and Scientific Interest, south of 407 ETR, between Martin Grove Road and Islington Avenue, with occurrence dated 2007. Records for this species were also present in Breeding Bird Atlas data (dated between 2001-2005) although record locations are unknown. Hooded Warbler is regulated as 'Threatened' under the SARA but has no designation under the ESA. The Hooded Warbler breeds in the undergrowth of forest interiors of mixed hardwoods. Field investigations in spring/early summer of 2016 identified marginally suitable habitat for this species, including several wooded areas identified across the study area; however, these wooded areas are likely to small and disturbed to support this species. No Hooded Warbler were identified during LGL's 2016 field investigations.

Chimney Swift

Natural heritage data provided by TRCA contained a single record of Chimney Swift from north of 407 ETR, between Hurontario Street and Kennedy Road, with occurrence dated 2010. Records for this

species were also present in Breeding Bird Atlas data (dated between 2001-2005) although record locations are unknown. 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). Field investigations in spring/early summer of 2016 identified marginally suitable habitat for this species, including anthropogenic areas and open habitats that were identified across the study area. However, no Chimney Swifts were identified during LGL's 2016 field investigations.

Eastern Wood Pewee

Natural heritage data provided by TRCA contained eight records of Eastern Wood Pewee from several locations across the study area, with occurrence dates ranging from 2003 to 2014. Records for this species were also present in Breeding Bird Atlas data (dated between 2001-2005) although record locations are unknown. MNRF confirmed that Eastern Wood Pewee have been recorded in the study area, although the record location is unknown. Eastern Wood Pewee is listed as 'Special Concern' under the ESA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. The Eastern Wood Pewee is listed as 'Special Concern' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), but has no status under the SARA. The Eastern Wood Pewee 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 and mixed forest habitat communities and forest edges were identified within the study area. Field investigations undertaken by LGL in 2016 identified several Eastern Wood Pewee which were restricted to wooded areas in the vicinity of the Rainbow Creek crossing.

Bank Swallow

Natural heritage data provided by TRCA contained a single record of Bank Swallow from north of 407 ETR and west of Highway 50, in the vicinity of the Humber River, with occurrence dated from 2014. Breeding Bird Atlas data for areas in the vicinity of the study area also contained records (dated between 2001-2005) for Bank Swallow, although record locations are unknown. MNRF noted that Bank Swallow have the potential to be located in the vicinity of the study area. Bank Swallow is regulated as 'Threatened' under the ESA but is not regulated under the SARA. The Bank Swallow 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. Field investigations undertaken by LGL in spring/early summer of 2016 identified marginally suitable nesting habitat for this species, including eroded watercourse banks that were identified across the study area. However, no Bank Swallows were identified during LGL's 2016 field investigations.

Barn Swallow

Natural heritage data provided by TRCA contained two records of Barn Swallow from north of 407 ETR and immediately west of Islington Avenue and north of 407 ETR immediately west of Kennedy Road South, with occurrence dates from 2003 and 2015, respectively. Breeding Bird Atlas data for areas in the vicinity of the study area also contained records (dated between 2001-2005) for Barn Swallow, although record locations are unknown. MNRF confirmed that Barn Swallow have been recorded in the study area, although the record location is unknown. Barn Swallow is regulated as 'Threatened' under the ESA. Barn Swallow is not a regulated species under 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. Field investigations undertaken by LGL in late spring/early summer of 2016 identified foraging Barn Swallow at a number of sites across the study area. Two Barn Swallow nesting colonies were also identified within the study area, including nests on a structure in parkland east of Dixie Road and south of 407 ETR and an additional nesting colony under the 407 ETR bridge structure at the Lower Humber River (H7).

Wood Thrush

Natural heritage data provided by TRCA contained five records of Wood Thrush from several locations across the study area, with occurrence dates ranging from 2002 to 2011. Breeding Bird Atlas data for areas in the vicinity of the study area also contained records (dated between 2001-2005) for Wood Thrush, record locations are unknown. MNRF confirmed that Wood Thrush have been recorded in the study area, although the record location is unknown. Wood Thrush is listed as 'Special Concern' under the ESA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. Wood Thrush is not a regulated species 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 study area. However, no Wood Thrush were identified during LGL's 2016 field investigations.

Bobolink

Natural heritage data provided by TRCA contained a single record of Bobolink from south of 407 ETR between Tomken Road and Dixie Road, with occurrence dated from 2003. Review of the NHIC database contained a single record of Bobolink which was located around the intersection of 407 ETR and Kipling Avenue. The NHIC record for Bobolink was dated from 2004. Breeding Bird Atlas data for areas in the vicinity of the study area also contained records (dated between 2001-2005) for Bobolink, although record locations area unknown. MNRF confirmed that Bobolink have been recorded in the study area, although the record location is unknown. The Bobolink, a species with a broad distribution across southern Ontario, is regulated 'Threatened' under the ESA. Bobolink is not a regulated species under 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. However, the open-country habitats

identified during LGL's 2016 surveys typically did not consist of grass dominated vegetation as preferred by this species. No Bobolinks were identified during LGL's 2016 field investigations.

Eastern Meadowlark

Natural heritage data provided by TRCA contained seven records of Eastern Meadowlark from several locations across the study area, with occurrence dates ranging from 2003 to 2011. Review of the NHIC database indicated records of Eastern Meadowlark across much of the study area. The NHIC database had eight relatively recent (2002, 2004, 2010 and 2011) records for 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, although record locations are unknown. MNRF confirmed that Eastern Meadowlark have been recorded in the study area, although the record location is unknown. The Eastern Meadowlark, a species with a broad distribution across southern Ontario, is regulated 'Threatened' under the ESA. Eastern Meadowlark is not a regulated species under 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. However, open-country habitats identified during LGL's 2016 surveys typically did not consist of grass dominated vegetation as preferred by this species. No Eastern Meadowlark were identified during LGL's 2016 field investigations.

Little Brown Myotis

Rare species records provided by MNRF, Aurora District Office identified little brown myotis as a species that has the potential to be found within the vicinity of the study area. Little brown myotis is regulated as 'Endangered' under the ESA and the SARA. The little brown myotis is a cavity-roosting species and stays wherever it is warm. It roosts in natural cavities under loose bark and in crevices, and in buildings where it can be found in attics, behind shutters or siding, or under shingles (Kurta 1995). Little brown myotis emerge from roosts for their nightly hunt around dusk, and forage over water and semi-open areas such as rocky hillsides, lawns, fields and forest edges (Nagorsen and Brigham 1993). Habitat for this species has the potential to be found across much of the study area. However, no incidental observations of little brown myotis were recorded during LGL's 2016 field investigations; although no targeted surveys for this species were conducted.

Northern Myotis

Rare species records provided by MNRF, Aurora District Office identified northern myotis as a species that has the potential to be found within the vicinity of the study area. Northern myotis is regulated as 'Endangered' under the ESA and the SARA. The northern myotis is found throughout forested areas in southern Ontario, choosing to roost under loose bark and in the cavities of trees. Habitat for this species has the potential to be found where forested/treed habitat exists across the study area. However, no incidental observations of northern myotis were recorded during LGL's 2016 field investigations; although no targeted surveys for this species were conducted.

Monarch

Rare species records provided by MNRF, Aurora District Office identified Monarch as a species that has been previously recorded within the study area, although the record location is unknown. The Monarch is listed as 'Special Concern' under the ESA and SARA; however, this species is not a regulated species ('Endangered' or 'Threatened') under the ESA. The Monarch can be found in a wide variety of open county/grassland habitats such as meadows and open fields. Open-country, meadow (including roadside vegetation) and agricultural habitat types found across the study area have the potential to provide habitat suitable to support this species. However, no incidental observations of Monarch were recorded during LGL's 2016 field investigations; although no targeted surveys for this species were conducted.

3.1.8. Designated Natural Areas

Designated natural areas include areas identified for protection by the MNRF, CVC, TRCA and upper tier and lower tier municipalities.

ENVIRONMENTALLY SIGNIFICANT/SENSITIVE AREAS

The Woodbridge Cut Environmentally Significant/Sensitive Area (ESA No. 15) is located in the City of Vaughan south of the 407 ETR right-of-way and east of Martin Grove Road adjacent to the rail corridor. The location of the ESA is presented on **Figure 3.2c**.

PROVINCIALLY SIGNIFICANT WETLANDS

There are no Provincially Significant Wetlands (PSWs) located within 120 m of the study area. There are several unevaluated wetlands within the study area that were classified according to the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* (Lee *et al*. 1998). These communities include shallow marshes comprised of cattails (*Typha* spp.) and/or common reed (*Phragmites australis*), meadow marsh communities that consist of a variety of grasses and forbs, and Reed-Canary Grass Mineral Meadow Marsh. These wetlands are typically narrow communities associated with riparian habitat.

AREAS OF NATURAL AND SCIENTIFIC INTEREST

The Woodbridge Pleistocene Cut Earth Science Area of Natural and Scientific Interest (ANSI) is located in the City of Vaughan south of the 407 ETR right-of-way and east of Martin Grove Road adjacent to the rail corridor. The location of the ANSI is presented on **Figure 3.2c**.

NATURAL HERITAGE SYSTEM

City of Brampton

According to the City of Brampton Official Plan (2015), the majority of the watercourses and their associated habitat 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 'Other Wetland' are identified throughout the study area, typically associated with the valleylands of study area watercourses.

According to the Region of Peel Official Plan (2016), several areas within the study area (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, Etobicoke Creek (west branch), Spring Creek, Mimico Creek (between Airport Road and Goreway Drive), and the West Humber River. In addition, it is the policy of the Region to encourage the restoration and enhancement of natural heritage features and functions with the Parkway Belt West Plan area. 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 Etobicoke Creek West Branch and the West Humber River. These 'River Valley Connections Outside the Greenbelt' are also identified as 'Selected Areas of Provincial Interest' in the Region of Peel's Official Plan. The Greenbelt Plan was recently updated by the Ministry of Municipal Affairs in May 2017 and three watercourses located within the study area are now designated as 'Urban River Valleys' including two watercourses in the City of Brampton, Region of Peel (Etobicoke Creek West Branch and West Humber River). The City of Brampton and Region of Peel's Official Plans have not yet been updated to address these changes to the Greenbelt Plan.

City of Mississauga

'Greenlands', 'Public and Private Open Spaces' and 'Significant Natural Areas and Natural Green Spaces' are identified in the City of Mississauga Official Plan (2017) along Fletchers Creek located adjacent to the study area. The area surrounding Fletchers Creek in the vicinity of the study area is also identified as a 'Natural Hazards' area and 'Urban System – Green System'.

According to the Region of Peel Official Plan, one area within the vicinity of the study area (within the City of Mississauga) is located within the 'Core Areas of the Greenlands System in Peel': lands associated with Fletchers Creek.

City of Vaughan

According to the City of Vaughan Official Plan (2017), the valleyland associated with Albion Creek and its tributary, the Lower Humber River and its tributaries, Rainbow Creek, and Black Creek and its tributary are designated as 'Natural Areas' and 'Natural Areas and Countryside'. The lands south of 407 ETR east of Martin Grove Road, and a few small patches of parkland throughout the study limits, are designated as 'Parks'. The majority of the lands located between Highway 427 and Highway 27, north of 407 ETR, are designated as 'Private Open Spaces'. In addition, the major valleylands associated with tributaries of the Lower Humber River and Rainbow Creek between Martin Grove Road and Islington Avenue are designated as 'Core Features' of the City of Vaughan Natural Heritage Network. Also identified as part of this system is Albion Creek and its tributary which cross the study area east of Highway 427, a tributary of the Lower Humber River and the associated storm water management facility, and Black Creek and its tributary east of Highway 400. These features are classified as 'Core Features', with the exception of the storm water management facility that is an 'Enhancement Area'. A number of lands adjacent to the 'Core Features' are identified as 'Unapproved' portions of the Natural Heritage Network. These lands are under consideration for Core Feature additions, deletions or classification as Enhancement Area. The Lower Humber River crosses the study area between Martin Grove Road and Pine Valley Drive and the natural heritage features within this large natural area are of significance. The Lower Humber River valleylands are identified as a 'Greenbelt Plan External Linkage' that connects the Greenbelt Plan Natural Heritage System (and habitats further north) to other habitats further downstream, recognizing the importance of these areas as linkages.

According to the Region of York Official Plan (2016), a major watercourse/valleylands corridor (north-south) associated with the Lower Humber River and its tributaries and Rainbow Creek is located between Martin Grove Road and Pine Valley Drive both north and south of 407 ETR. This corridor is designated as part of the 'Regional Greenlands System' and as 'Woodlands' in the Official Plan. Some pockets of 'Conservation Area/Regional Forest' are also located north and south of the 407 ETR corridor generally at this location. In addition, the area between east of Kipling Avenue and east of Pine Valley Drive northerly from the York Region boundary with the City of Toronto has been identified in the Official Plan as 'Greenlands System Vision', as a linkage between other natural heritage features north and south of the study area. As noted above, the Greenbelt Plan was recently updated in May 2017 and three watercourses located within the study area are now designated as 'Urban River Valley's' including one watercourse in the City of Vaughan, Region of York (Lower Humber River). The City of Vaughan and Region of York Official Plans have not yet been updated to address these changes to the Greenbelt Plan.

City of Toronto

The tributary of the Lower Humber River, which crosses Steeles Avenue between Highway 27 and Martin Grove Road within the study area, is designated as 'Green Space System' in the City of Toronto Official Plan (2015). This tributary of the Lower Humber River and Albion Creek (crossing Steeles Avenue/407 ETR west of Highway 27) are also identified as part of the City's Natural Heritage System.

3.1.9. Air Quality

Environment Canada and 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:

- Elmcrest Road (Station #60413 in Centennial Park, Toronto), which is located approximately 9 km south-east of the study area;

- Yonge and Finch (Station #60421 at Hendon Avenue, Toronto), which is located approximately 10 km east of the study area;
- Brampton (Station #60428 at 525 Main Street, Brampton), which is located approximately 7 km north-west of the study area; and,
- Toronto West (Station #60430 at 125 Resources Road, Toronto), which is located approximately 7 km south of the study area.

To assess existing conditions in the study area, historical air quality monitoring data from these four (4) monitoring stations were considered to be representative. **Tables 3.4 to 3.8** outline the recent measurement history (2009 to 2013 – as 2014 data was not available) at these monitoring locations (at the time of the existing conditions report), and present a summary of the data in terms of 50th percentile, 90th percentile and maximum concentrations. As outlined in the tables, not all pollutants of concern are monitored at all four locations. It should also be noted that historical monitoring data for PM10, acrolein, acetaldehyde, formaldehyde and GHG's are not available at any of these four (4) monitoring stations.

Tables 3.4 to 3.8 indicate that historically NO2, CO, 1,3-butadiene and benzene have all been within the accepted standards. For PM2.5, compliance with the 24-hour Canadian Ambient Air Quality Standard (CAAQS) is measured as the 98th percentile over three years, and, 98th percentile concentrations for each year are within the CAAQS. Annual PM2.5 has also been well within its applicable criterion. In summary, the historical data outlines a typical urban/suburban airshed with occasional smog periods during which air quality is compromised. In Ontario, the smog season occurs from May through September.

TABLE 3.4: HISTORICAL NO2 AMBIENT AIR QUALITY DATA

STATION ID	STATION LOCATION	AVERAGING TIME	NO_2 (PPB)					
			AAQC	YEAR				
				2009	2010	2011	2012	2013
#60413	Elmcrest Road (Centennial Park), Toronto	1-hr 50th Percentile	-	13	12	-	-	-
		1-hr 90th Percentile	-	30	29	-	-	-
		1-hr Maximum	200 ppb	79	73	-	-	-
		24-hr 50th Percentile	-	14	14	-	-	-
		24-hr 90th Percentile	-	25	24	-	-	-
		24-hr Maximum	100 ppb	46	46	-	-	-
#60421	Yonge & Finch, Toronto	1-hr 50th Percentile	-	14	12	13	11	11
		1-hr 90th Percentile	-	31	29	30	28	25
		1-hr Maximum	200 ppb	71	65	61	60	56
		24-hr 50th Percentile	-	15	13	14	13	12
		24-hr 90th Percentile	-	26	24	26	23	21
		24-hr Maximum	100 ppb	47	44	48	35	39
#60428	525 Main Street, Brampton	1-hr 50th Percentile	-	10	7	8	7	6
		1-hr 90th Percentile	-	29	24	25	25	20
		1-hr Maximum	200 ppb	57	62	61	55	55
		24-hr 50th Percentile	-	12	9	10	8	7
		24-hr 90th Percentile	-	24	19	21	21	17
		24-hr Maximum	100 ppb	42	45	41	33	39
#60430	125 Resources Road, Toronto	1-hr 50th Percentile	-	17	18	17	14	14
		1-hr 90th Percentile	-	34	35	34	31	30
		1-hr Maximum	200 ppb	68	66	71	70	76
		24-hr 50th Percentile	-	18	19	18	16	15
		24-hr 90th Percentile	-	29	30	29	25	24
		24-hr Maximum	100 ppb	44	45	46	37	48

AAQC = Ambient Air Quality Criteria
Note: All values are from the Environment Canada NAPS website: http://maps-cartes.ec.gc.ca/rnspa-naps/data.aspx?lang=en

TABLE 3.5: HISTORICAL PM2.5 AMBIENT AIR QUALITY DATA

STATION ID	STATION LOCATION	AVERAGING TIME	PM2.5 (µG/M3)					
			CAAQS	YEAR				
				2009	2010	2011	2012	2013
#60413	Elmcrest Road (Centennial Park), Toronto	24-hr 50th Percentile	-	5	6	-	-	-
		24-hr 90th Percentile	-	11	13	-	-	-
		24-hr 98th Percentile	28*	16	21	-	-	-
		24-hr Maximum	-	34	27	-	-	-
		Annual	10	6	ins	-	-	-
#60421	Yonge & Finch, Toronto	24-hr 50th Percentile	-	5	5	6	6	7
		24-hr 90th Percentile	-	11	13	16	14	15
		24-hr 98th Percentile	28*	16	23	24	20	21
		24-hr Maximum	-	37	30	31	27	43
		Annual	10	ins	6	8	7	8
#60428	525 Main Street, Brampton	24-hr 50th Percentile	-	5	4	5	5	7
		24-hr 90th Percentile	-	11	12	12	11	16
		24-hr 98th Percentile	28*	16	21	18	17	21
		24-hr Maximum	-	33	27	24	26	40
		Annual	10	6	6	6	6	8
#60430	125 Resources Road, Toronto	24-hr 50th Percentile	-	5	5	6	6	8
		24-hr 90th Percentile	-	11	13	13	13	16
		24-hr 98th Percentile	28*	16	21	19	18	22
		24-hr Maximum	-	34	29	25	25	42
		Annual	10	6	7	7	7	9

CAAQS = Canadian Ambient Air Quality Standard
ins = insufficient data to calculate annual average
*Compliance is measured as the 98th percentile over three years, therefore 10 exceedances (1% of 365x3) of the 24 hour criterion is within compliance for three years or nominally 3 exceedances per year on average for the three most recent monitoring years.
Note: All values are from the Environment Canada NAPS website: http://maps-cartes.ec.gc.ca/rnspa-naps/data.aspx?lang=en

TABLE 3.6: HISTORICAL CARBON MONOXIDE AMBIENT AIR QUALITY DATA

STATION ID	STATION LOCATION	AVERAGING TIME	CO (PPM)					
			AAQC	YEAR				
				2009	2010	2011	2012	2013
#60430	125 Resources Road, Toronto	1-hr 50th Percentile	-	0.2	0.2	0.2	0.2	0.2
		1-hr 90th Percentile	-	0.4	0.3	0.3	0.4	0.4
		1-hr Maximum	30 ppm	1.2	1.8	1.4	1.4	1.4
		8-hr 50th Percentile	-	0.2	0.2	0.2	0.2	0.2
		8-hr 90th Percentile	-	0.3	0.3	0.3	0.4	0.4
		8-hr Maximum	13 ppm	1.1	1.6	0.8	1.2	1.2

AAQC = Ambient Air Quality Criteria
Note: All values are from the Environment Canada NAPS website: http://maps-cartes.ec.gc.ca/rnspa-naps/data.aspx?lang=en
Carbon monoxide was not monitored at Stations #60413, #60421 and #60428 during the period 2009 to 2013.

TABLE 3.7: HISTORICAL 1,3-BUTADIENE AMBIENT AIR QUALITY DATA

STATION ID	STATION LOCATION	AVERAGING TIME	1,3-BUTADIENE (µG/M3)					
			AAQC	YEAR				
				2009	2010	2011	2012	2013
#60413	Elmcrest Road (Centennial Park), Toronto	24-hr Average	-	0.05	0.05	0.04	0.05	0.04
		24-hr Maximum	10	0.15	0.17	0.09	0.22	0.11
#60428	525 Main Street, Brampton	24-hr Average	-	0.05	0.05	0.05	0.05	0.05
		24-hr Maximum	10	0.17	0.18	0.14	0.22	0.13

AAQC = Ambient Air Quality Criteria
Note: All values are from the Environment Canada NAPS website: http://maps-cartes.ec.gc.ca/rnspa-naps/data.aspx?lang=en
1,3-Butadiene was not monitored at Stations #60421 and #60430 during the period 2009 to 2013.

TABLE 3.8: HISTORICAL BENZENE AMBIENT AIR QUALITY DATA

STATION ID	STATION LOCATION	AVERAGING TIME	BENZENE (µG/M3)					
			AAQC	YEAR				
				2009	2010	2011	2012	2013
#60413	Elmcrest Road (Centennial Park), Toronto	24-hr Average	-	0.56	0.51	0.56	0.50	0.50
		24-hr Maximum	2.3	1.32	1.63	0.75	1.28	1.12
#60428	525 Main Street, Brampton	24-hr Average	-	0.55	0.55	0.60	0.54	0.54
		24-hr Maximum	2.3	1.32	1.76	0.85	1.54	1.43

AAQC = Ambient Air Quality Criteria
Note: All values are from the Environment Canada NAPS website: http://maps-cartes.ec.gc.ca/rnspa-naps/data.aspx?lang=en
Benzene was not monitored at Stations #60421 and #60430 during the period 2009 to 2013.

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.

Figure 3.3 presents the regional land use within the study area and **Figure 3.4** 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, 2014) 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 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, 2014 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.

The PPS, 2014 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, 2014 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. It also promotes the coordination between municipalities and other levels of government for planning transit and infrastructure.

The 2014 updates strengthened the language regarding the protection for provincially planned transportation corridors and the promotion of land use compatibility for lands adjacent to planned and existing corridors. It allows for the protection of major goods movement facilities and corridors. It also permits the planning for infrastructure/public service facilities beyond a 20-year period.

The 407 Transitway includes connections with other regional and local transit systems such as GO Transit, Brampton Transit, Züm (Brampton Rapid Transit), MiWay (Mississauga Transit), VIVA (York Rapid Transit, York Region Transit, and the Toronto Transit Commission. It will directly serve regional urban growth centres like the Vaughan Metropolitan Centre and Downtown Brampton, while connecting to the Bramalea GO Station, and ultimately to the Richmond Hill Centre/Langstaff Gateway, and Markham Centre.

PLACES TO GROW GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE, 2017

The Places to Grow Growth Plan for the Greater Golden Horseshoe (Growth Plan) (Ministry of Municipal Affairs, 2017) 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; however, this plan was replaced with the 2017 Plan that took effect on July 1, 2017.

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. It 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 Growth Plan identifies a number of regional urban growth centres including the Vaughan Metropolitan Centre and Downtown Brampton, which are located in the vicinity of the study area. Other urban growth centres identified in the Growth Plan would ultimately connect to this section of the 407 Transitway, including the Richmond Hill Centre/Langstaff Gateway, and Markham Centre.

MTO GREATER GOLDEN HORSESHOE TRANSPORTATION PLAN - DRAFT GOALS AND OBJECTIVES, SEPTEMBER 2017

The draft goals and objectives of MTO's Greater Golder Horseshoe Transportation Plan (September 2017) are focused on eight factors: healthy, equitable, environmentally sustainable, economically responsible, resilient, prosperous, integrated, and connected. The 407 Transitway meets the goals and objectives of this plan as it will reduce dependence on personal vehicles and reduce greenhouse gas emissions, provide equitable service, and protect natural heritage and prime agricultural lands. The Transitway can adapt to the future, supports economic growth and job creation, is integrated with other land uses and transit services, and connects people, places and goods.

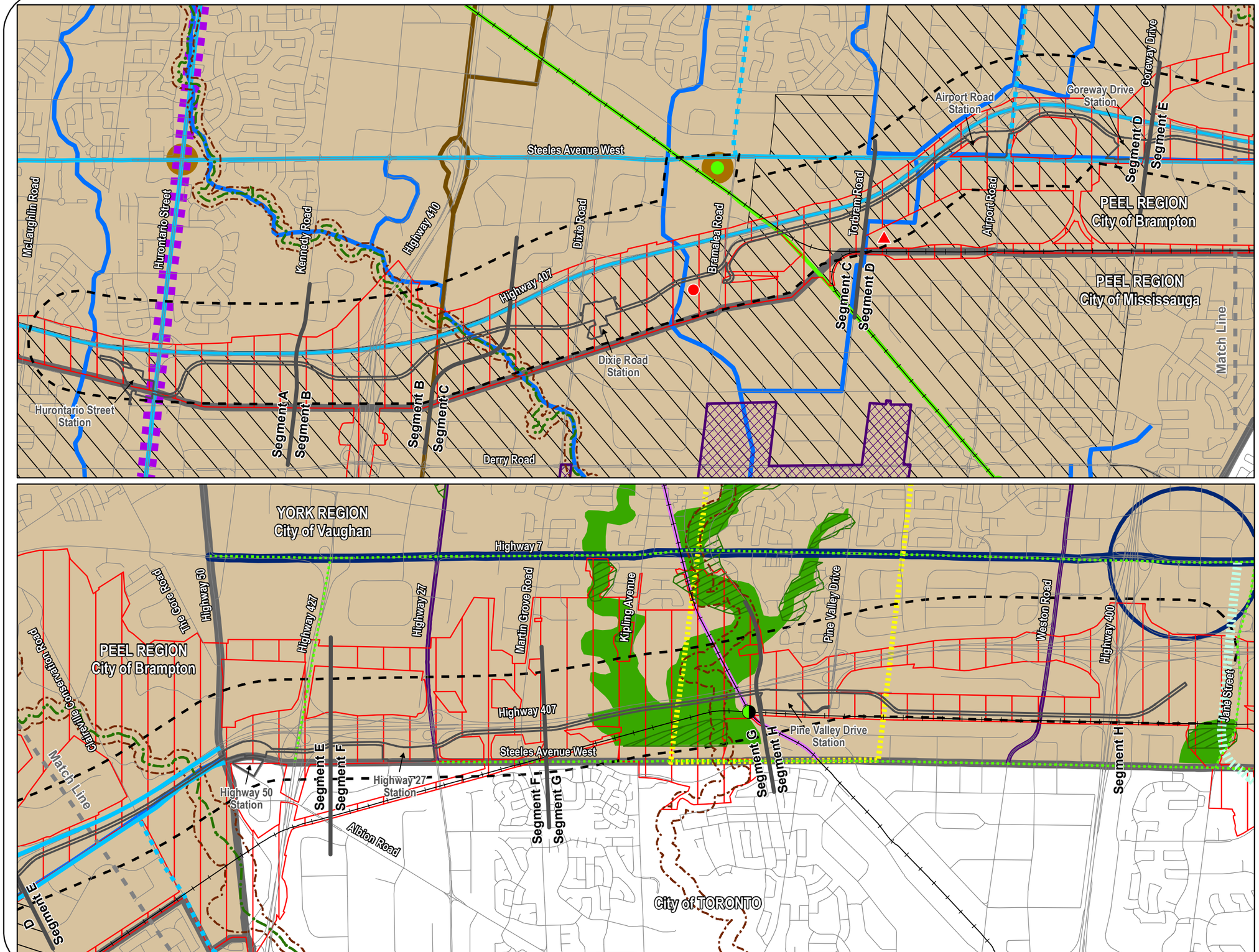
GREENBELT PLAN, 2017

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 recently 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 area; Oak Ridges Moraine Conservation Plan area; Parkway Belt West Plan area; and, Greenbelt Plan 'Protected Countryside' and 'Urban River Valleys'.

Three watercourses designated as 'Urban River Valleys' under the Greenbelt Plan (2017) are located within the study area and include:

- Etobicoke Creek West Branch located west of Tomken Road;
- West Humber River located west of Highway 50; and
- Lower Humber River located west of Islington Avenue.

Section 6 of the Greenbelt Plan outlines the policies that apply to the 'Urban River Valleys' land use designation. Only publicly owned lands are subject to the policies of the 'Urban River Valleys' designation. This designation is subject to the applicable Official Plan policies as long as they have regard for the objectives of the Greenbelt Plan. All existing, expanded or new infrastructure subject to the *Environmental Assessment Act* is permitted provided that 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 objectvies 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 is presented in this document.



LEGEND

- Impact Assessment Corridor
- Municipal Boundary
- Greenbelt Urban River Valley

Land Use - Peel Region

- Parkway Belt West Plan Boundary
- River Valley Connections Outside the Greenbelt
- GO Rail Line - Express Rail
- Other Rapid Transit Corridor
- Other Potential Rapid Transit Corridor
- Existing GO Rail Station
- Mobility Hub - Gateway
- Airport
- Toronto Pearson International Airport Operating Area
- Urban System
- Regional Intensification Corridor (Conceptual)
- Energy from Waste Facility
- Peel Integrated Waste Management Facility
- Trunk Sewer
- Transmission Main

Land Use - York Region

- Urban Area
- Parkway Belt West Plan Boundary
- Regional Centre
- Regional Greenlands System
- Regional Corridor
- Greenlands System Vision
- Conservation Area/Regional Forest
- Potential Commuter Rail Line
- Proposed GO Station
- Regional Transit Priority Network
- Regional Rapid Transit Corridors
- Subway Extension
- Railway

Data Sources: Peel Region Official Plan, York Region Official Plan, Parkway Belt West Plan, Ministry of Municipal Affairs and Housing.

400 200 0 400 Metres

407 TRANSITWAY WEST - REGIONAL LAND USE WITHIN THE STUDY AREA

LGL LIMITED
environmental research associates

Project:	TA8558	**Figure:**	3.3
Date:	June, 2018	**Prepared By:**	MWF
Scale:	1 : 37,000	**Checked By:**	EJS

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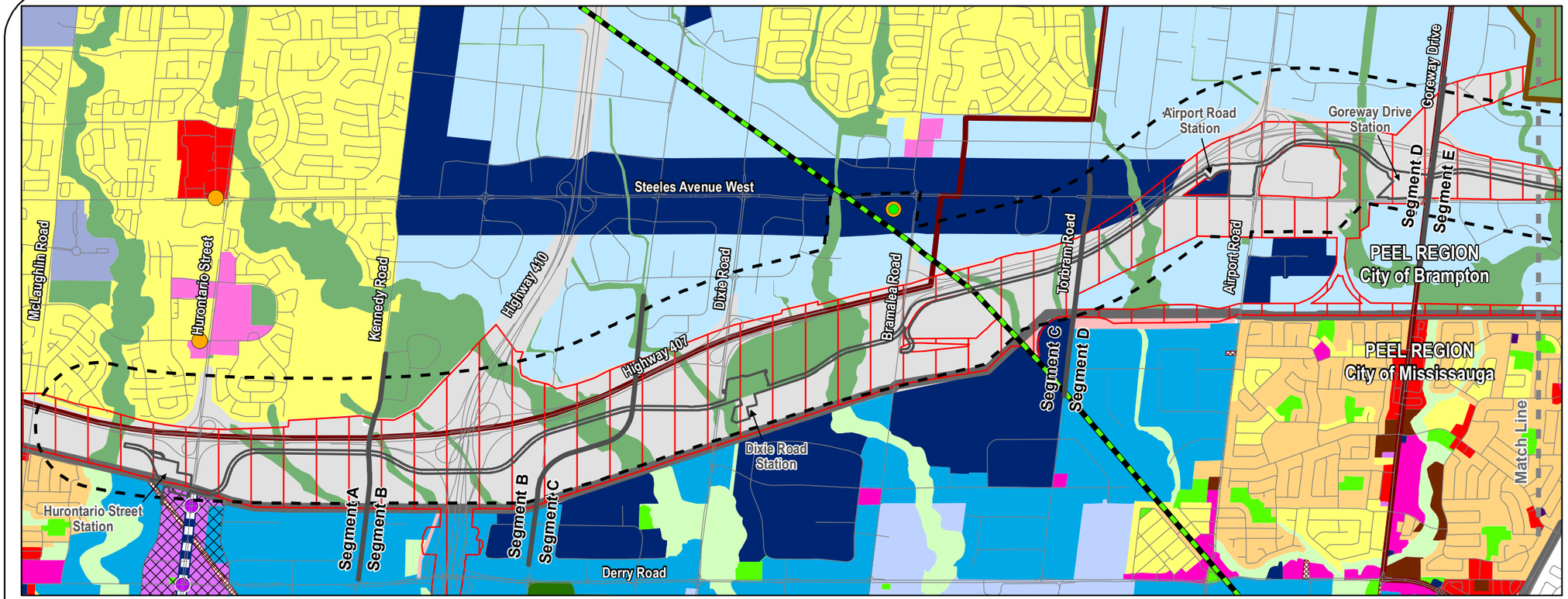

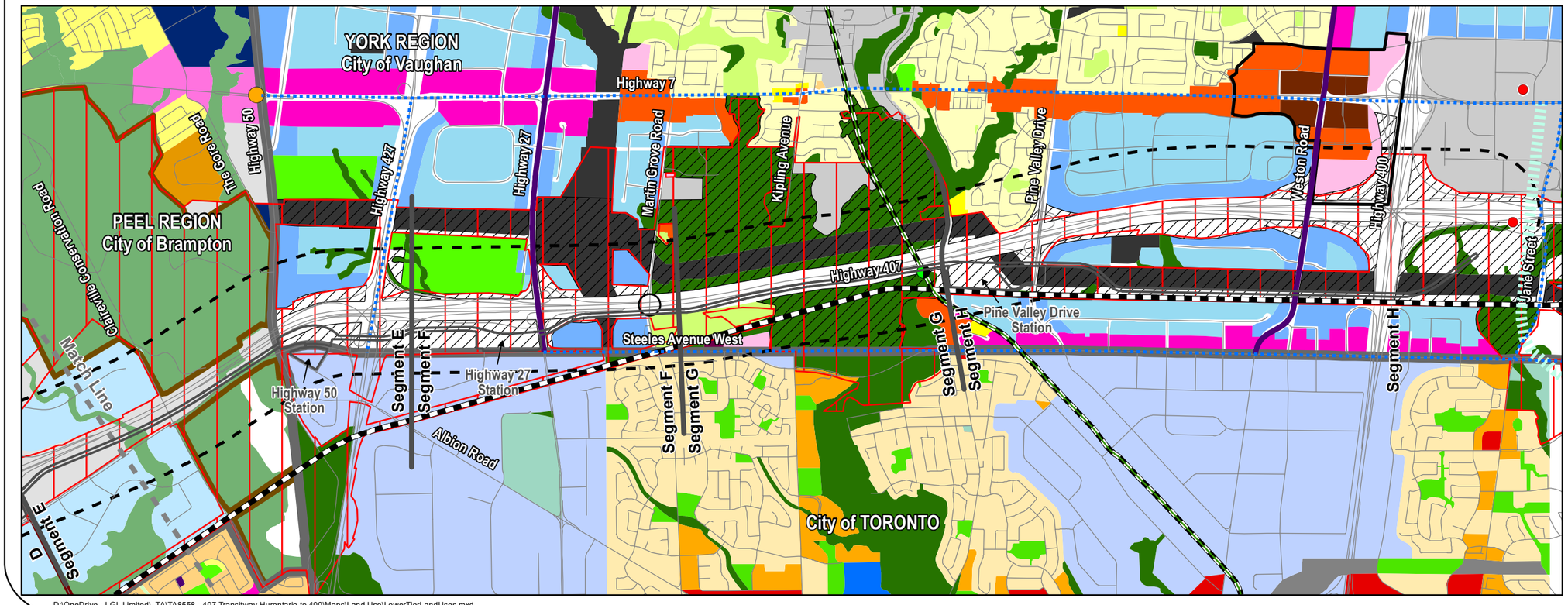

LEGEND

- Impact Assessment Corridor
- Study Area
- Municipal Boundary
- Parkway Belt West Plan Boundary

Land Use - Brampton
- GO Rail
- GO Rail Stations
- Major Transit Nodes
- Residential
- Estate Residential
- Regional Retail
- Office
- Business Corridor
- Industrial
- Major Institutional
- Open Space
- Provincial Highways
- L.B.P.I.A. Operating Area Conservation Area

Land Use - Mississauga
- Existing Commuter Rail
- Higher Order Transit Corridor
- Light Rail Transit Station
- Intensification Corridor
- Residential Low Density I
- Residential Low Density II
- Residential Medium Density
- Residential High Density
- Mixed Use
- Convenience Commercial
- Office
- Business Employment
- Industrial
- Airport
- Public Open Space
- Private Open Space
- Greenlands
- Parkway Belt West
- Utility

Land Use - Vaughan
- Natural Areas
- Parks
- Private Open Spaces
- Low-Rise Residential
- Low-Rise Mixed-Use
- Mid-Rise Residential
- Mid-Rise Mixed Use
- High-Rise Residential
- High-Rise Mixed-Use
- Community Commercial Mixed-Use
- Employment Commercial Mixed-Used
- General Employment
- Prestige Employment
- Infrastructure and Utilities
- Lands Subject to Secondary Plans
- Parkway Belt West Plan
- New Interchanges
- Railway
- Proposed GO Station
- Proposed Commuter Rail Line
- Required Secondary Plan Areas
- Regional Transit Priority Network
- Regional Rapid Transit Corridors
- Proposed Subway Extension
- Proposed Subway Station

Land Use - Toronto
- Neighbourhoods
- Apartment Neighbourhoods
- Mixed Use Areas
- Parks and Open Space Areas
- Natural Areas
- Parks
- Other Open Space Areas
- Institutional Areas
- Employment Areas
- Utility Corridors

Data Sources: Parkway Belt West Plan, Brampton Official Plan, Mississauga Official Plan, Vaughan Official Plan, Toronto Official Plan.

400 200 0 400 Metres

407 TRANSITWAY WEST – LOWER TIER MUNICIPAL LAND USE WITHIN THE STUDY AREA

LGL LIMITED
environmental research associates

Project:	TA8558	**Figure:**	3.4
Date:	June, 2018	**Prepared By:**	MWF
Scale:	1 : 37,000	**Checked By:**	EJS

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In addition, a number of other policies are 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 has been made for the potential impacts of the 407 Transitway on the 'Urban River Valleys' within the study area. Efforts have been made to avoid crossing at sensitive areas at each of the three 'Urban River Valleys' to the extent possible, and spanned bridges are proposed at each watercourse crossing to avoid impacts within the bankfull channel and minimize overall impacts to the watercourses/valleys. Appropriate mitigation measures have been included to maintain and/or enhance the 'Urban River Valleys' (see **Chapter 6 of this EPR**).

Section 3.2.6.2 of the Greenbelt Plan (2017) outlines policies for considering land conversions or redevelopment in or abutting the 'Urban River Valleys', 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 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 streams.

These considerations have been assessed and the appropriate environmental protection and mitigation measures have been included in the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report (see **Appendix E of this EPR**), the Fish and Fish Habitat Existing Conditions and Impact Assessment Report (**Appendix D of this EPR**) and the Landscape Design Report (**Appendix I of this EPR**). The impacts associated with quality and quantity of urban runoff have been addressed in the Drainage Report (**Appendix C of this EPR**).

Given that the Greenbelt Plan was updated very recently (May 2017), none of the regional or local Official Plans have completed conformity exercises to address changes to the Greenbelt Plan. However, the land use designations (Open Space and Natural Areas) that apply at each of the 'Urban River Valleys' are consistent with the general intent of the Greenbelt Plan.

CONSERVATION AUTHORITIES ACT

The *Conservation Authorities Act* was created by the Ontario Provincial Legislature in 1946 to ensure the conservation, restoration and responsible management of hydrological features through programs that balance human, environmental and economic needs. Under Ontario Regulation 166/06 of the *Conservation Authorities Act* (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), the Toronto and Region Conservation Authority is responsible for managing the renewable natural resources within nine watersheds in the Greater Toronto Area. The goals of this regulation are to ensure public safety and protect property with respect to natural hazards (including erosion and flooding), and to safeguard watershed health by preventing pollution and destruction of sensitive environmental areas such as wetlands, shorelines, watercourses, and valleylands. This regulation provides TRCA with the authority to regulate interference and development within the regulated area. In accordance with the *Crown Agency Act*, R.S.O. 1990, C.48, s.1, and the *Conservation Authorities Act*, R.S.O. 1990, C.27, the Ministry of Transportation is exempt from the *Conservation Authorities Act*. However, as part of the 407 Transitway project, both the Toronto and Region Conservation Authority and Credit Valley Conservation were involved in the review of the Transitway project and were invited to participate in the Technical Advisory/Resource Group. In addition, a separate meeting with the Toronto and Region Conservation Authority took place to discuss the project in more detail. As part of the 407 Transitway project, a detailed natural heritage assessment has been conducted and the appropriate technical reports (including a Drainage, Hydrology, Stormwater Management and Floodplain Hydraulics Report – **Appendix C of this EPR**) have been prepared. Environmental protection/mitigation measures are provided in **Chapter 6 of this EPR** of this document to minimize impacts to slopes, erosion/sedimentation and flooding. **Chapter 9 of this EPR** includes a discussion of extreme weather events, erosion and sedimentation control and increases in lake and water levels and outlines the proposed design considerations and protection measures to mitigate these natural hazards.

METROLINX REGIONAL TRANSPORTATION PLAN, 2008

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 first component of the 407 Transitway servicing York Region with a connection to Pearson

International Airport via Highway 427 was highlighted as a project for completion within the first 25 years of the RTP's adoption. The section of the 407 Transitway from Highway 427 to Kennedy is scheduled for 2023, while the section from Kennedy to Oshawa is on the 25-year plan. The section of the 407 Transitway from Hurontario Street to Highway 400 is currently planned for the long-range planning horizon. The Big Move identifies a regional rail service between Milton and Meadowvale (25 Year Plan) that crosses the 407 Transitway study area.

A new 2041 Regional Transportation Plan for the Greater Toronto and Hamilton Area (September 2017) is currently being finalized by Metrolinx. This report continues the work from the Big Move and outlines how governments and transit organizations can work together to build a transportation system that puts traveller needs at the core of planning and operations. The plan recommends expansion of the existing transit network that supports the creation of a transit network that is comprehensive, connected, accessible, sustainable and focused on people. The draft Plan identifies other regional transit facilities/networks in delivery or in development located in the vicinity of the study area.

PARKWAY BELT WEST PLAN, 1978

The Parkway Belt West Plan (PBWP) (Ministry of Municipal Affairs and Housing, 2008 – Office Consolidation to June 2008) 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. **Figure 3.3** presents the boundary of the PBWP throughout the study 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 Office Consolidation compiling amendments to the PBWP was prepared for information purposes in June 2008. This Office Consolidation document was reviewed to obtain land use information within the Parkway Belt West boundary located within 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.

The 'Inter-Urban Transit' designation includes the lands approved for the transitway under Amendment 147 'Highway 407 Inter-Urban Transitway, Mississauga to Markham' (January 2000) to the Parkway Belt West Plan.

There are a number of lands that have been removed from the PBWP area through amendments to the Plan. As a result, there are some 'gaps' in the PBWP lands between the highway/transitway infrastructure corridor and the electric power facility infrastructure corridor, from west of Highway 427 to Highway 400. A range of other land use types have been developed within these 'gaps', which are described further in the following descriptions of municipal Official Plan land use designations.

REGION OF PEEL OFFICIAL PLAN

According to Census Canada (Statistics Canada, 2011), Peel Region has a population of approximately 1,296,814. The Places to Grow Growth Plan for the Greater Golden Horseshoe has identified growth projections for the Region of Peel to accommodate 350,000 new jobs and 740,000 additional residents by 2031 (increase from job and population numbers in 2001), for a total of 880,000 jobs and population of 1,770,000 in 2031.

The Region of Peel Official Plan (Office Consolidation October 2016) was approved by the Minister of Municipal Affairs and Housing in 1996, and subsequent Official Plan reviews have been completed. The Office Consolidation (2016) reflects the Regional Official Plan Amendments (ROPAs) that were approved following the Official Plan review process that commenced in 2007. A number of ROPAs are still under appeal, and Ontario Municipal Board (OMB) hearings could result in changes to the Official Plan.

In addition, the Region initiated another Official Plan review process in 2013. The review process is in progress, but will involve reviewing the current Official Plan to ensure that it is current, meets Provincial Plans and policy statements, and achieves the Region's goals and objectives. This review was delayed by the 2017 Provincial Plan Update.

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. 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 (see **Figure 3.3**), mobility hubs (see **Figure 3.3**), nodes and corridors and in other areas served by transit (Objective 5.6.1.5).

The Toronto – Lester B. Pearson International Airport is located in the City of Mississauga, south of the study area. The study area is located within the operating area of the airport (as defined in Figure 11 of the Official Plan) – see **Figure 3.3**. One of the objectives of the Official Plan is to optimize the economic potential of the International Airport, having regard for existing and future industry, business and employment opportunities, and the interests of existing and future residents (Objective 5.9.6.1). A range of policies are included in the Official Plan to implement this objective. The Official Plan encourages development of land uses compatible with the existing airport facility.

The Region of Peel Greenlands System is comprised of 'Core Areas', 'Natural Areas and Corridors', and 'Potential Natural Areas and Corridors'. The recognition, protection and stewardship of these areas will support and strengthen the integrity and long-term sustainability of the ecosystems in the Region of Peel and adjacent municipalities. The Greenlands System is comprised of the following natural areas: Areas of Natural and Scientific Interest (ANSIs), Environmentally Significant or Sensitive Areas (ESAs), Escarpment Natural Areas, Escarpment Protection Areas, fish and wildlife habitat, habitats of threatened and endangered species, wetlands, woodlands, valley and stream corridors, shorelines, natural lakes, natural corridors, groundwater recharge and discharge areas, open space portions of the PBWP, and other natural features and functional areas (Policy 2.3).

The Official Plan identifies the criteria or methodology for identifying these features, where applicable. In particular, the Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study (2009) identifies the criteria for identifying significant woodlands and wildlife habitat in the Region. Development and site alteration is generally prohibited within 'Core Areas of the Greenlands System in Peel', except for certain land uses including essential infrastructure, pre-approved or authorized under an environmental assessment process, such as the proposed Transitway (Policy 2.3.2.6). Several areas are located within the 'Core Areas of the Greenlands System in Peel', including lands associated with Fletchers Creek, Etobicoke Creek (west branch), Spring Creek, Mimico Creek (between Airport Road and Goreway Drive), and the West Humber River. In addition, it is the policy of the Region to encourage the restoration and enhancement of natural heritage features and functions within the PBWP area (Policy 2.5.2.5). 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 Etobicoke Creek West Branch and the West Humber River. These 'River Valley Connections Outside the Greenbelt' are also identified as 'Selected Areas of Provincial Interest' in the Region of Peel's Official Plan. As discussed above, the Greenbelt Plan was recently updated in May 2017 and three watercourses located within the study area are now designated as 'Urban River Valleys' under the Greenbelt Plan including two watercourses located within the Region of Peel (Etobicoke Creek West Branch and West Humber River). The Region of Peel's Official Plan has not yet been updated to address these changes to the Greenbelt Plan.

The Region of Peel land use designations are presented on **Figure 3.3**. 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 (see **Figure 3.3**), where the policies of that Provincial Plan apply.

A Regional Intensification Corridor (Conceptual) is located at the westerly limits of the study area (centred around Hurontario Street) (see **Figure 3.3**) that will connect two Conceptual Urban Growth Centres located north and south of the study area (Schedule D).

The existing Bramalea GO Station located at Bramalea Road and Steeles Avenue is identified as a Mobility Hub – Gateway (Schedule G) – see **Figure 3.3.** A Mobility Hub – Gateway is a major transit station that is located at the interchange of two or more current or planned rapid transit lines and meets criteria for transit boardings and surrounding land use densities. The Bramalea GO Station would intersect with the planned 407 Transitway, and other transit service providers (Brampton Transit and MiWay). A second Mobility Hub-Gateway (Schedule G) is located north of the study area at Hurontario Street and Steeles Avenue along the Conceptual Regional Intensification Corridor (see **Figure 3.3**).

CITY OF BRAMPTON OFFICIAL PLAN

The City of Brampton 2006 Official Plan was approved in part by the OMB in 2008. The Official Plan Office Consolidation (November 2015) includes updates to reflect decisions of some appeals to the OMB, conformity with 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 Consolidation.

The City of Brampton identifies the 407 Transitway in its description of the transit system. It is identified as a busway that can become a Light Rail Transit corridor in the future.

The land use designations within the study area from the City of Brampton Official Plan (Schedule A) are presented in **Figure 3.4**. The study area is designated as 'Parkway Belt West', 'Provincial Highways', 'Open Space', 'Residential', 'Industrial', and 'Business Corridor'. The study area is also located within the Lester B. Pearson International Airport Operating Area, as shown in **Figure 3.3** and **Figure 3.4**. A description of these land use designations is presented below.

Parkway Belt West: the lands within this designation are part of the PBWP area, and this plan should be referred to for land use planning regulations. The Official Plan does identify 'Provincial Highways' and 'Open Space' land use designations on Schedule A, which are intended to be consistent with the land use designations of the PBWP. Where there are discrepancies, the policies of the PBWP will apply. The lands between the 407 ETR corridor and the hydro corridor from Highway 410 to Torbram Road are designated as 'Industrial'. The permitted land uses will be prescribed in a future Secondary Plan; however, until one is prepared, permitted uses will be limited to those permitted under the PBWP.

Provincial Highways: includes the provincial highways, including 407 ETR, Highway 410, and other associated facilities.

Open Space: includes natural and cultural heritage, and recreational open space features (public parkland, conservation areas, and private commercial recreation), including the area surrounding watercourses within the study area.

Residential: includes a range of residential land uses, from single detached dwellings to high rise apartments. Complementary uses are also permitted in this land use designation. Secondary Plans provide further detail on the density of residential areas, and other complementary permitted uses. One 'Residential' area is located within the study area north of 407 ETR from the westerly study limits to Kennedy Road.

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 407 ETR (east of Highway 410) within the study area.

Business Corridor: these areas are intended to accommodate a range of business, service, and institutional uses that will serve the general public and adjacent employment lands. Certain land uses are not permitted within this designation, including those that involve outdoor storage and displays (auto repair, auto-body paint and repair, commercial self-storage warehouses). A high level of urban design is required within these areas to maintain the positive business image of the area. In addition, noise sensitive public and institutional uses are not permitted within the Lester B. Pearson International Airport Operating Area (day care centres, schools, nursing homes, and hospitals). A 'Business Corridor' has been identified within the study area along Steeles Avenue from east of Dixie Road to east of Airport Road. More detailed information for this area is available in the Secondary Plans.

The existing GO rail line, which crosses 407 ETR east of Bramalea Road, and the existing GO station at Bramalea Road located within the study area are shown in **Figure 3.4**. The GO station at Bramalea Road is considered a 'Major Transit Node' by the City of Brampton. Two other 'Major Transit Nodes' are located north of the study area along Hurontario Street.

A total of five Secondary Plan Areas apply to the study area including Fletchers Creek South, Steeles Industrial, Bramalea South Industrial, Gore Industrial South, and Parkway Belt Industrial Area.

The Official Plan outlines a series of policies related to Natural Heritage and Environmental Management. Schedule D (and Schedule A) of the Official Plan identifies natural heritage features within the municipality. The majority of the watercourses in the study area are designated as 'Open Space' and 'Valleyland/Watercourse Corridor'. In addition, areas of 'Woodland' and 'Other Wetland' are identified throughout the study area, typically associated with the valleylands of study area watercourses. The woodlands and wetlands identified have likely not been assessed for significance, as this data is based on secondary source information from Conservation Authorities, MNRF and other data sources. Confirmation of these features will be required as part of the terrestrial and aquatic habitat assessments. Development and site alteration is not permitted on lands adjacent to the natural heritage features (on Schedule D) unless an Environmental Impact Study has been completed to demonstrate that there will be no negative impacts on significant natural features or their ecological functions. The terrestrial and aquatic habitat assessments being completed under this study will address this requirement.

CITY OF MISSISSAUGA OFFICIAL PLAN

The study area is located directly adjacent to the City of Mississauga and encroaches slightly into the City of Mississauga in two locations: the westerly limits of the study area to just east of Hurontario Street; and, a very small area around Torbram Road.

The City of Mississauga Official Plan Office Consolidation includes OMB decisions and City Council approved Official Plan Amendments as of March 13, 2017. The land use designations within the study area from the City of Mississauga Official Plan are presented in **Figure 3.4**. The study area is designated as 'Residential Low Density II', 'Greenlands', 'Business Employment', 'Office', 'Utility', 'Industrial', and 'Parkway Belt West'. A description of these land use designations is presented below.

Residential Low Density II: permits detached, semi-detached, and duplex dwellings, as well as other low-rise dwellings with individual frontages. Transit facilities and transportation infrastructure are also permitted in land with this designation. One small area designated "Residential Low Density II' is located at the westerly limits of the study area. The Meadowvale Village Neighbourhood Character Area is identified along the northern border of Mississauga, between Fletchers Creek and Financial Drive, south to Highway 401. The policies for this Character Area also apply to lands immediately surrounding the Village. Meadowvale Village is recognized as Ontario's first Heritage Conservation District. All new development must comply with the Heritage Conservation District Plan and be in keeping with the area's cultural heritage landscape and attributes. More detailed information for the Meadowvale Village Character Area is available in section 16.17 of the Official Plan.

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. 'Greenlands', 'Public and Private Open Spaces' and 'Significant Natural Areas and Natural Green Spaces' are identified along Fletchers Creek. The area surrounding Fletchers Creek in the vicinity of the study area is also identified as a 'Natural Hazards' area and 'Urban System – Green System'.

Business Employment: includes 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. One 'Business Employment' area is located within the study area west of Hurontario Street. The Gateway Corporate Centre has been identified along Hurontario Street to the

municipal border, with a Special Site 2, 'City Wide Gateway' identified as being the main "gateway" into Mississauga from Brampton. Distinct built form and design elements will be implemented in this area. More detailed information for this area can be found in section 15.3 of the Official Plan.

Office: includes major and secondary offices, as well as accessory uses. Transit facilities and transportation infrastructure are also permitted in these lands. Major offices are permitted in Major Transit Station Areas. The 'Gateway' Character Area has been identified from Fletchers Creek east to Derrycrest Drive, and from Edwards Boulevard east to Highway 410, although only a very small portion of this area is located within the study area (surrounding Hurontario Street). Detailed information for this Character Area can be found in section 17.5 of the Official Plan. The 'Northeast' Character Area has also been identified along the northern Mississauga border from Highway 410 east to Airport Road. Certain uses in this area are not permitted along Airport Road; more detailed information is available in section 17.8 of the Official Plan.

Utility: parking and accessory use is permitted in lands with this designation, as well as transit facilities and transportation infrastructure. A 'Utility' area crosses through the study area west of Hurontario Street.

Industrial: includes a variety of businesses, services and recreational facilities. Transportation facilities, as well as transit facilities and transportation infrastructure, are also permitted on these lands. A very small area designated 'Industrial' is located within the study area south of 407 ETR around Torbram Road.

Parkway Belt West: these lands are part of the PBWP area, and this plan should be referred to for land use planning regulations. The Official Plan also indicates that other uses not permitted within these lands include major power generating facilities. A very small area designated 'Parkway Belt West' is located within the study area south of 407 ETR around Torbram Road.

A 'Higher Order Transit Corridor'/'Intensification Corridor' is identified in the Official Plan along Hurontario Street to the municipal border with the City of Brampton. This area is also identified as a 'Corporate Centre' in the Official Plan (see **Figure 3.4**).

REGION OF YORK OFFICIAL PLAN

According to Census Canada (Statistics Canada, 2011), York Region has a population of approximately 1,024,000. York Region is expected to have a population of 1.79 million and employment of 900,000 by the year 2041 (Places to Grow Growth Plan).

In 2009, York Region adopted the York Region Official Plan, which was approved by the Ministry of Municipal Affairs and Housing in 2010. A number of appeals to the OMB resulted in changes to the Official Plan, which have been incorporated into the April 2016 Office Consolidation.

The Region of York Official Plan (2016) sets policies to help guide economic, environmental and community-building decisions affecting the use of land. The Official Plan identifies the Vaughan, Richmond Hill and Markham regional centres as future hubs of business, cultural, government, and social activity. These regional centres are expected to contain the highest concentration and greatest mix of uses in the Region, including range in employment and housing opportunities. Development will be of compact, well-designed form that contributes to an urban fabric that is vibrant, safe, attractive, pedestrian-friendly and transit-supportive.

One of the Official Plan's goals is to cooperate with area municipalities, GO Transit, the Toronto Transit Commission, Ministries of the Province of Ontario and the adjacent municipalities in the planning, coordination, integration and operation of existing and new transit services and to encourage increases in transit modal splits across the Region's boundaries.

The Official Plan identifies the need to promote the implementation of a regional rapid transit network, such as a transitway within the 407 ETR corridor, and to encourage the development of transportation inter-modal stations at appropriate locations. It aims to develop stations that are coordinated with urban centres and will serve as both destinations and transfer facilities between different modes of travel. A transportation station would typically include facilities to allow transfers between local transit services and rapid transit, as well as providing a passenger drop-off area and an adequate commuter parking area.

The Region of York land use designations are presented on **Figure 3.3**. The York Region Official Plan designates the study area as 'Urban Area' and 'PBWP'.

A major watercourse/valleylands corridor (north-south) associated with the Lower Humber River and its tributaries and Rainbow Creek is located between Martin Grove Road and Pine Valley Drive both north and south of 407 ETR. As discussed above, the Greenbelt Plan was recently updated in May 2017 and three watercourses located within the study area are now designated as 'Urban River Valleys' under the Greenbelt Plan including one watercourse located within the Region of York (Lower Humber River). The Region of York's Official Plan has not yet been updated to address these changes to the Greenbelt Plan.

CITY OF VAUGHAN OFFICIAL PLAN

The City of Vaughan prepared a new Official Plan in 2010, which was endorsed by the Region of York on June 28, 2012. The Official Plan was appealed to the OMB and has received partial approval. The Official Plan (Office Consolidation January 2017) outlines the City of Vaughan's commitment to supporting a comprehensive transit system. The Official Plan has identified key areas of intensification to support the planned transit improvements (including the subway extension), and will encourage a street pattern and density to support transit use. Council is committed to working with other agencies such as York Region Transit/Viva, Metrolinx and Smart Commute towards these goals.

The City of Vaughan Official Plan includes policies to encourage and support early implementation of transit in a dedicated transitway within the 407 ETR and 427 corridors, as well as high occupancy vehicle lanes and carpool lots along provincial highways (Section 4.2.1.12). The Official Plan also has the provision for development approvals to provide funds, lands or commitments for services prior to the development/use of lands. Transitways and pedestrian access to transit facilities are included in the list of items that can be included in development agreements (Section 10.1.3.7).

According to the Official Plan, land uses within the study area include: 'Infrastructure and Utilities', 'Parkway Belt West Lands', 'Prestige Employment', 'General Employment', 'Community Commercial Mixed-Use', 'Mid-Rise Mixed Use', 'Low-Rise Mixed-Use', 'Low-Rise Residential', 'Natural Areas', 'Parks', and 'Private Open Spaces' (see **Figure 3.4**). A description of the land use designations is provided below.

Parkway Belt West Lands: permitted uses for lands in this area will follow the provisions of the Parkway Belt West Plan. The City of Vaughan Official Plan indicates that these lands are to be used for linear facilities such as transportation, communications and utility infrastructure, as well as a linked system of public and private open spaces. In the event that lands within this area are determined to be surplus, an amendment to the Official Plan is required.

Infrastructure and Utilities: these lands are used at grade for infrastructure (utility corridors, stormwater management). The hydro corridors and stormwater management facility/pond within the study area are designated as 'Infrastructure and Utilities'.

Prestige Employment: includes high quality buildings in an attractive pedestrian friendly, connected and transit-oriented environment. A variety of lot sizes are intended to attract various types of employment. This land use designation is typically found on arterial streets along the edges of employment areas, or along 400-series highways. Permitted uses include industrial, office, retail, ancillary retail uses, and gas stations. Most of the employment lands abutting the 407 ETR corridor through the study area are designated as 'Prestige Employment'.

General Employment: includes industrial land uses with low scale buildings and a range of lot sizes to encourage a variety of employment uses. A full range of industrial, as well as office and retail uses are permitted. Large areas are designated as 'General Employment' on both the north and south sides of the 407 ETR corridor, generally between Highway 50 and Martin Grove Road, and from west of Pine Valley Drive to Highway 400.

Community Commercial Mixed-Use: are commercial areas that are appropriate for non-residential intensification, and can make use of existing or planned rapid transit. These areas will include retail uses and population related employment uses. The north-west quadrant of 407 ETR and Highway 400 is designated as this land use. This is not identified as an intensification area (on Schedule 1), therefore, permitted uses for non-intensification areas would apply. These include office uses to a maximum ground floor area of 12,500 m^2 per lot, cultural and entertainment uses, retail uses, and gas stations.

Mid-Rise Mixed Use: includes a mix of residential, retail, community and institutional uses. Permitted uses include residential units, home occupations, community facilities, cultural uses, retail uses, office, parking garages, hotels, and gas stations. The area north of the 'Community Commercial Mixed-Use' described above is designated as 'Mid-Rise Mixed Use'. A small area west of Islington Avenue, south of 407 ETR is also designated as 'Mid-Rise Mixed Use'.

Low-Rise Mixed-Use: includes a mix of residential, community, and small-scale retail uses that serve the local area. Permitted uses can include residential units, home occupations, small scale hotels, retail uses, and office uses. A small area with this land use designation is located on the east side of Islington, north of 407 ETR.

Low-Rise Residential: includes a low rise built form of up to three storeys in height. Permitted uses include residential units, home occupations, private home daycares, and small-scale convenience retail. A small area north of 407 ETR between Islington Avenue and Pine Valley Drive is designated as 'Low Rise Residential'.

Natural Areas, Parks and Private Open Spaces: The valleyland associated with Albion Creek and its tributary, the Lower Humber River and its tributaries, Rainbow Creek, and Black Creek and its tributary are designated as 'Natural Areas'. The lands south of 407 ETR east of Martin Grove Road, and a few small patches of parkland throughout the study limits are designated as 'Parks'. The majority of the lands located between Highway 427 and Highway 27, north of 407 ETR, are designated as 'Private Open Spaces'.

There is one area within the study area identified as 'Land Subject to Secondary Plans': the Vaughan Metropolitan Centre. This Secondary Plan Area was partially approved by the OMB on November 18, 2015 (Vaughan 2015). The Vaughan Metropolitan Centre (Regional Centre) is located at the easterly limits of the study area, east of Highway 400 and north of 407 ETR. This centre will be a regional transportation and transit centre, being the destination of the TTC Subway extension (see **Figure 3.4**), and located at the intersection of two major highways. It will also be a centre for economic development and commercial activity. In addition, there is one 'Required Secondary Plan Area' located just north of 407 ETR west of Highway 400: Weston Road and Highway 7 (see **Figure 3.4).** This area is designated as a 'Primary Centre' and is the site of a Secondary Plan that has not yet been undertaken. There is also one 'Area Subject to Area Specific Plans': the Huntington Business Park (Area Specific Area #11) located north of 407 ETR between Highway 50 and Highway 427. A number of areas have also been identified as 'Areas Subject to Site Specific Plans' located within/adjacent to the study area including: 7242 Highway 27 (Site Specific Area #2), Parkwaybelt West Amendment Areas (Site Specific Area #23), northwest Corner of Steeles Avenue and Kipling Avenue (Site Specific Area # 16), 30 and 70 Aviva Park Drive (Site Specific Area # 28), and southeast corner of Weston Road and 407 ETR (Site Specific Area #29).

In terms of the future transportation network in Vaughan, a new interchange is proposed at 407 ETR and Martin Grove Road (see **Figure 3.4**). In addition, a future Highway 400 road crossing has been identified between the east and west sides of Highway 400, joining the Vaughan Metropolitan Centre to the east of Highway 400 and the 'Primary Centre' to the west. Major arterial roads include Highway 50, Highway 27, Islington Avenue, Pine Valley Drive and Weston Road. Minor arterial roads include Martin Grove Road. A proposed commuter rail line is identified along the existing GO line crossing 407 ETR west of Islington Avenue. A GO station is proposed at this location. Highway 427, Highway 7 and 407 ETR are identified as Regional Rapid Transit Corridors, and Highway 27 and Weston Road are identified as Regional Transit Priority Networks (see **Figure 3.4**).

CITY OF TORONTO OFFICIAL PLAN

The City of Toronto Official Plan (Office Consolidation June 2015) was approved by the City of Toronto Council in 2002, but approved with modifications by the OMB in 2015.

A very small portion of the southerly edge of the study area from Highway 50 to north of Thackeray Park is located in the City of Toronto. The lands between Highway 50 and east of Highway 27 (at the hydro corridor) south of Steeles Avenue are designated as 'Employment Areas'. The tributary of the Lower Humber River crossing Steeles Avenue between Highway 27 and Martin Grove Road is designated as 'Green Space System'. The remaining portion of the lands within the City of Toronto in the study area (west from the hydro corridor to north of Thackeray Park) are designated as 'Neighbourhoods'.

Employment Areas: include economic activities that support employment, such as offices, manufacturing, warehousing, distribution, research and development facilities, utilities, media facilities, parks, hotels, ancillary retail, and restaurants and small scale stores and services.

Neighbourhoods: include a full range of residential uses, as well as parks, schools, local institutions and small scale stores and shops serving area residents.

Natural Areas: include parks and open space, valleys, watercourses and ravines.

3.2.2. Existing Land Uses

AGRICULTURE

City of Brampton

A large area of land underneath the hydro corridor is farmed within the City of Brampton. A review of aerial photography shows evidence of cultivation of these fields. No farmer's markets/buildings were able to be confirmed during the review of secondary sources.

City of Vaughan

There are four agricultural land uses in the City of Vaughan. T & L Farm Fresh Vegetables is located on the north side of Steeles Avenue, west of Highway 27. The property consists of some primary structures, surrounded by agricultural fields. It is unclear if this property is open to the public during the growing season. Woodbridge Vegetable Farms is located north of 407 ETR and east of Martin Grove Road. This property contains a building for the sale of produce, and has a number of agricultural fields on the adjacent lands. A third farming property is located north of 407 ETR, just west of Islington Avenue. The property has the Economy Farmers Market located on Islington Avenue, with an access road that leads to the agricultural fields. Evidence indicates that all of these agricultural lands are growing crops (vegetables). In addition to these agricultural operations, there appears to be land cultivation at Highway 427 next to the Queen of Heaven Catholic Church.

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 Brampton

There is one area with low density residential land use within the City of Brampton. Residences are located just east and west of Hurontario Street, north of the 407 ETR corridor.

City of Mississauga

There is a small low density residential area located along the northern border of the City of Mississauga, between Fletchers Creek and McLaughlin Road.

City of Vaughan

In the City of Vaughan, there is a low-rise residential subdivision located within the study area north of the 407 ETR corridor between Islington Avenue and Pine Valley Drive. A small area of 'Low-Rise Mixed Use' exists in the study area immediately west of this residential area (east of Islington Avenue) and may contain residences.

City of Toronto

One low density residential area is located within the City of Toronto (within the study area) and is located south of Steeles Avenue from west of Martin Grove Road to north of Thackeray Park.

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 Brampton

Industrial park land uses are found throughout the study limits in the City of Brampton north and south of the 407 ETR and hydro transmission corridors. The industrial land uses range from large facilities with significant gross floor area and trucking facilities, to industrial/commercial business parks providing a range of medium and smaller sized businesses. Some of the businesses located within these areas north of 407 ETR include ABB Inc. (power plant consultant), Industrial Warehousing and Courier, Coca-Cola beverage distributors, Calyx Transportation Group (trucking company), Canadian Tire/Goodyear Tire Distribution Centre, Triple M. Metal LP (recycling centre and retail yard), and Brookfield Cold Storage. A few of the businesses located south of 407 ETR include FSI Landscape Supply, Del Industrial Metals (steel distributor), Commercial Roll (roll-formed metal product manufacturer), 747 Flea Market, and Multi Glass Insulation Ltd. (fabricated insulation distributors).

The Pearson Convention Centre is located south of 407 ETR on Steeles Avenue, west of Airport Road. This Convention Centre is used for shows and events, and has an on-site hotel and parking facilities.

City of Mississauga

A very small business employment area is located between Hurontario Street and Edwards Boulevard, north of Topflight Drive immediately south of the study area. This area includes a hotel (Comfort Inn), and several supply and service companies, such as Premium Tire and Auto Centre, NCI (cyber security consultants), Busch Vacuum Technics, Inc. (vacuum pumps and systems), and Shred and Pak Counter Roll (packaging paper products). The Edwards Boulevard at Topflight Drive Go Park and Ride station and parking lot are also located in this area. Another small industrial area is located around Torbram Road just south of the study area including Waste Management of Canada Corporation and Weston Forest Products.

City of Vaughan

Smaller pockets of industrial land uses are located generally west of the natural area associated with the Humber River. In this area there are a few large facilities, including the 407 ETR Concession Company Limited, Gracious Living Corporation and Store (patio furniture and houseware), Orios Family Restaurant, Window City Industries Inc. (windows manufacturer), and Leisureworld. Manitex Liftking ULC, Dynamic Store Fixtures, Delsan-Aim, Home Technical Services, and Flowserve are located south of 407 ETR east of Islington Avenue. A much larger industrial and commercial park is located within the vicinity of the study area west and east of Highway 400. Some of this area includes retail and commercial facilities, such as those associated with the Vaughan Cineplex Cinema at Highway 400. Costco and the Paramount Conference and Event Venue (a two floor event space for corporate, social, or wedding affairs) are located west of Highway 400. IKEA is located east of Highway 400 just north of 407 ETR.

Another small pocket of businesses is located just south of 407 ETR between Pine Valley Drive and Highway 400. In this area there are a few larger facilities, including HD Supply Brafasco (home and construction suppliers), Spicers Canada ULC (paper distributor), and Torstar Printing Group (Vaughan Press Centre). Slightly smaller businesses are also located in this area, including Seacore Seafood Inc. (seafood wholesaler) and Euro Forgings Inc. (architectural components for railing and fence industries).

City of Toronto

Large areas of industrial and commercial land uses are located in the study area along and south of Steeles Avenue, from west of Highway 427 to generally east of Highway 27. Some of these businesses include Anthony Florist, Canadian Industrial Truck Radiators Inc., Singh Electronics, Harpreet Puri/Punjab Insurance/, SuperVisa Insurance, City Truck & Forklift Driving School Ltd., Tutor Doctor, A. Bertozzi Importing Inc., Positive Fulfillment Services Ltd., Reliance Home Furnishings, ESSO, Country Style, RK Vanaik Furnitures, SVP Sports, Taz Clothing, Digital Fantasy, Glaze Opticals, Furnace Filters, Auto Alarm and Sound, Kinky Miss Lingerie, A 1 Small Engine Shop, Joshi Law Office, Raptor Vapes, Dufferin Tile, Delfresh, Beyond Fragrances, Spitfire Bar and Grill, RMP Motors Automotive Service, La Ida Foods Ltd., Bhatia Cloth House, Tool Academy, European Autobody, Limelight Auto Inc., Peak Performance Products Inc., Authentic Menu Gourmet Foods Inc., Milan Wineries, and Advance Safety Limited World.

COMMUNITY AND RECREATIONAL FACILITIES

City of Brampton

Four churches/religious facilities are located within the study area in the City of Brampton including the Church of God Sabbath-Keeping Ministries (north of 407 ETR and west of Dixie Road on Westwyn Court), Islamic Forum of Canada (north of 407 ETR and east of Dixie Road on Advance Boulevard), the Sri Katpaga Vinayagar Temple (south of 407 ETR and east of Airport Road on Parkhurst Square), and the Shiv Shakti Gyaan Cultural Sabha (also south of 407 ETR and east of Airport Road on Parkhurst Square).

The Brampton Golf Club is located north of 407 ETR, west of Kennedy Road. It is an 18 hole golf course facility that was established in 1921.

The Brampton Golf Centre is located just south of 407 ETR at Topflight Drive and Edwards Boulevard (at the southerly study limits). It has a driving range, pitching and putting greens, and mini golf.

On the east side of Kennedy Road is the Powerade Centre/Brampton Sports Park, a sports and entertainment complex that houses 4 NHL size rinks, seating capacity for 5,000 and a full-service restaurant that serves 250 people. The facility is also used for concerts, trade shows, film shoots and graduation ceremonies. Other sports facilities are outside the building, including 5 baseball diamonds, 3 cricket pitches, a rugby field, ball hockey court and paintball field.

The Dixie Highway 407 Park is located east of Dixie Road, south of 407 ETR. This facility contains a number of sports fields. It was also used as a soccer training site for the 2015 Pan Am Games. This area is identified as a 'City Wide Park' in Schedule E of the City of Brampton Official Plan. One additional 'City Wide Park' is located within the vicinity of the study area (just north of 407 ETR east of Kennedy Road.

The Parkshore Golf Club is located at the southern limits of the study area between Goreway Drive and Finch Avenue West south of Steeles Avenue. It is a 9 hole golf course facility.

The Claireville Conservation Area is located on the north and south sides of 407 ETR, between Goreway Drive and Highway 50 (see **Figure 3.4**). The majority of the Conservation Area is located in the City of Brampton (728 ha); however, some lands are located within the City of Toronto (19 ha). This Conservation Area is managed and operated by the Toronto and Region Conservation Authority. Public access is available for passive recreation at Indian Line Campground, Wild Water Kingdom, Etobicoke Field Studies Centre and Claireville Ranch. The land uses within the Conservation Area in the study area include the Wild Water Kingdom (described below) and the Etobicoke Field Studies Centre. The field studies centre is operated by the Toronto District School Board as an outdoor education school. Educational programs are provided for elementary school students.

Wild Water Kingdom is located at the easterly limits of the City of Brampton, south of 407 ETR between Goreway Drive and Finch Avenue West. This recreational facility is located on lands that are part of the Claireville Conservation Area, next to the Claireville Reservoir. AGTM Systems, a golf driving range facility, is also located within the Wild Water Kingdom.

The City of Brampton PathWays Master Plan (2002) identifies a number of trails, including a proposed trail generally along the existing hydro corridor south of 407 ETR, an existing north-south trail along Etobicoke Creek, a proposed trail along Bramalea Road, and a proposed north-south trail along the rail line leading to the Brampton Intermodal Terminal, to access trails in Claireville Conservation Area.

City of Mississauga

The City of Mississauga Official Plan indicates that a few long-term cycling routes will connect Mississauga with Brampton near and along Hurontario Street, including a multi-purpose trail along Fletchers Creek.

City of Vaughan

Three churches/religious facilities are located within the study area in the City of Vaughan including the Queen of Heaven Catholic Church and Cemetery (north of 407 ETR on the west side of Highway 27), the Shri Guru Ravidass Savha Ontario (south of 407 ETR on the east side of Highway 27 on Steeles Avenue) and the First Hungarian Baptist Church (north of 407 ETR on the east side of Islington Avenue).

The Vaughan Grove Sports Park has a number of sports fields, including soccer fields and baseball diamonds. The Woodbridge Soccer Club operates out of the Vaughan Grove Sports Club. It is located beside the Holy Cross Catholic Academy and the Ontario Soccer Centre, east of Martin Grove Road, north of 407 ETR.

Thackeray Park is located south of 407 ETR west of Islington Avenue.

Veneto Tennis Club and Ciociaro Social Club (banquet facility) are located on Kipling Avenue, north of 407 ETR (at the northerly study limits).

The City of Vaughan Pedestrian and Bicycle Master Plan Study (2007) identifies a number of future trails within the study area. These include a pathway adjacent to the planned 407 Transitway runningway, and a number of north-south trails.

City of Toronto

Four churches/religious facilities are located within the study area in the City of Toronto including the Bharat Sevashram Sangha of Toronto (southwest corner of 407 ETR and Highway 427 on Codlin Crescent), Bhagwan Valmiki Temple (southwest corner of 407 ETR and Highway 427 on Codlin Crescent), the New Charismatic International Ministry (south of 407 ETR and east of Highway 27 on Steeles Avenue), and the Humberlea Worship Centre (also south of 407 ETR and east of Highway 27 on Steeles Avenue).

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 BRAMPTON

The City of Brampton has identified a Central Area, which is intended to become a centre for business, retail, entertainment, tourism, cultural and institutional activities, as well as a range of housing. The area is intended to be transit supportive and a complete community with services and facilities that are easy to access. The Central Area is an Urban Growth Centre, identified in the Places to Grow: Growth Plan for the Greater Golden Horseshoe (Downtown Brampton). The central area is located north of the study area, connected by a Business Corridor to the industrial areas on the north side of the 407 ETR corridor, and by the Hurontario Street 'Main Street Primary Corridor'. The Region of Peel indicates that the westerly limits of the study area (centred around Hurontario Street) are also identified as a Regional Intensification Corridor (Conceptual) (see **Figure 3.3**) that will connect the two Conceptual Urban Growth Centres located north and south of the study area (Schedule D).

The Region of Peel Official Plan (Schedule G) identifies 'Other Potential Rapid Transit Corridors' including Bramalea Road, Airport Road, Finch Avenue, and Albion Road within the study area (see **Figure 3.3**).

CITY OF MISSISSAUGA

As noted above, the Region of Peel has identified a Regional Intensification Corridor (Conceptual) centred around Hurontario Street and a small portion of this Corridor is present within the section of the study area located within the City of Mississauga (see **Figure 3.3**). A 'Higher Order Transit Corridor'/'Intensification Corridor' is also identified in the City of Mississauga Official Plan at this location, which will include a future Light Rail Transit corridor and transit stations (see **Figure 3.4**). The northernmost Light Rail Transit station is proposed just south of the City of Mississauga northern border, south of 407 ETR directly adjacent to the study area. A second Light Rail Transit station is proposed just south of the study area at the intersection of Hurontario Street and Derry Road (see **Figure 3.4**). Intensification Corridors are those planned for higher density mixed use development with express transit services. The City of Mississauga Official Plan indicates that an interconnected higher order transit system will be created, connecting Intensification Areas, surrounding municipalities, the regional transit system, and the Toronto – Lester B. Pearson International Airport. This area is also identified as a 'Corporate Centre' in the Official Plan.

CITY OF VAUGHAN

The City of Vaughan and York Region have identified an area at the easterly study limits, at the north east quadrant of Highway 400 and 407 ETR, as the Vaughan Metropolitan Centre (Regional Centre). This area is planned to become the City's downtown, with high density mixed land uses, including civic activities, business, shopping, entertainment and living. Regional intensification corridors link the downtown to other intensification areas in the City of Vaughan. In addition, the TTC Subway Extension will terminate at this location (with a station), providing convenient access to subway and linking this area to downtown Toronto. The Vaughan Metropolitan Centre was identified as an Urban Growth Centre in the Places to Grow: Growth Plan for the Greater Golden Horseshoe (Vaughan Corporate Centre). The

Transitway will link to this regional centre, connecting to a transit/transportation centre and improving the transit facilities for the area.

The City of Vaughan Official Plan identifies some future transportation improvements, including a new interchange at Highway 407 and Martin Grove Road, and a proposed GO commuter rail line and proposed GO station at Islington Avenue. The proposed GO commuter rail line would connect with the 407 Transitway, and would provide opportunities to create connections between these transit facilities. A future Highway 400 Series Road Crossings is identified in the Official Plan north of Highway 407 between the east and west sides of Highway 400, joining the Vaughan Metropolitan Centre to the east of Highway 400 and the 'Primary Centre' to the west.

3.2.4. Built Heritage and Cultural Heritage Landscapes

A preliminary identification of existing cultural heritage resources within the study area was undertaken by consulting the following resources: municipal specific lists which provide an inventory of cultural heritage resources that are designated under Part IV or V of the *Ontario Heritage Act*, as well as those listed properties that are of cultural heritage value or interest to the town; the City of Mississauga's Cultural Resource Map on-line; Brampton Interactive Maps on-line; the inventory of Ontario Heritage Trust easements; the Ontario Heritage Trust's *Ontario Heritage Plaque Guide* on-line; Ontario Historical Plaques website; Parks Canada's *Canada's Historic Places* website; Parks Canada's *Directory of Federal Heritage Designations* on-line database of National Historic Sites; the Canadian Heritage Rivers System inventory; United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites; and, correspondence with the Cities of Brampton, Mississauga, Vaughan and Toronto. A field review was undertaken within the study area (after a review of all available secondary source information) by ASI on July 19th, 2016 to document the existing conditions of the study area.

A review of the federal registers and municipal and provincial inventories, as well as field investigations, determined that there are 38 cultural heritage resources within and adjacent to the study area, including: four farmscapes (CHLs 5, 7, 11 and 13), fifteen residences (BHRs 1, 4, 9, 10, 12, 13, and 15-23), one remnant farmscape (CHL 2), one historic settlement area (CHL 15), four cemeteries (CHLs 3, 6, 8 and 12), four bridges (BHRs 3, 6-8), one watercourse (CHL 1), one church (BHR 11), one commercial building (BHR 14), two industrial buildings (BHRs 2 and 5), three recreational properties (CHLs 4, 10 and 14) and one railscape (CHL 9). CHL 2 was formerly a listed property, however it has been confirmed as demolished. BHR 1 is listed on the municipal register, but has been approved for demolition. The identified cultural heritage resources are historically, architecturally, and contextually associated with nineteenth-century and twentieth-century land use patterns in the study area. **Table 3.9** provides a summary of these built heritage resources and cultural heritage landscapes.

TABLE 3.9: SUMMARY OF BUILT HERITAGE RESOURCES (BHRS) AND CULTURAL HERITAGE LANDSCAPES (CHLS) WITHIN/ADJACENT TO THE STUDY AREA

FEATURE	LOCATION	RECOGNITION	DESCRIPTION/COMMENTS
BHR 1	7575 Kennedy Road, Brampton	Listed, City of Brampton	An Ontario Gothic, L-plan, polychromatic brick farmhouse. Located on the east side of Kennedy Road, north of Highway 407, this 112 acre property contains the Powerade Centre, sports fields, the Peel Children's Safety Village, a farmhouse, a shed, and a barn.
BHR 2	15 Bramalea Road, Brampton	Listed, City of Brampton	21st century one storey industrial building. Only the frontage and signage are considered listed.
BHR 3	Gorewood Drive over Humber River, Brampton	Designated, Part IV	Constructed in 1930, the Wiley Bowstring Bridge is a rare example of a concrete bowstring bridge in Brampton.
BHR 4	8712/8940 Claireville Conservation Road, Brampton	Listed, City of Brampton	A vernacular, two-storey, brick residence built in 1915.
BHR 5	2111 Steeles Avenue East, Brampton	Identified during field review	Industrial building, first appears on aerial photography between 1971 and 1973.
BHR 6	Jane Street Rail Bridge	Identified during field review	A contemporary single span concrete rigid-frame bridge with two rail lines running over Jane Street, just south of the 407 ETR.
BHR 7	York CNR Bridge Islington/Humber Rail Bridge	TRCA Humber River Bridge Inventory	Uniform depth plate girders railway steel bridge with rare A frame concrete piers. Built in 1962 as a part of the CN Railway at Islington Avenue and 407 ETR
BHR 8	Islington Road Rail Bridge	Identified during field review	A steel and concrete plate girder bridge.
BHR 9	7303 Islington Avenue, Vaughan	City of Vaughan Heritage Inventory – Registered	One and one half storey white painted stucco Neo-Classical farmhouse with 6/6 wood windows, and a covered front porch.
BHR 10	7284-7362 Islington Avenue, Vaughan	City of Vaughan Heritage Inventory – Listed	Circa 1930s craftsman bungalow. one and one half storeys, grey horizontal clapboard, covered porch and large dormer.
BHR 11	7056 Islington Avenue, Vaughan	City of Vaughan Heritage Inventory – Listed	One storey side gable vernacular style church building, which has been reclad in polychromatic brick.
BHR 12	7371 Martin Grove Rd, Vaughan	City of Vaughan Heritage Inventory – Registered	Two and one half storey Queen Anne Revival style former residence, with red brick, and shingled gables.
BHR 13	7300 Highway 27, Vaughan	Identified during field review	A one and one half storey Ontario gothic style farmhouse, built circa 1885, with polychromatic brick, an arched gothic window in the front gable peak, yellow brick quoins and arches, and a covered, partially enclosed porch.
BHR 14	7242 Highway 27, Vaughan	Identified during field review	A one storey modernist motel was built to serve car travelers along Highway 27.
BHR 15	2158 Codlin Crescent	Identified during field review	One and one half storey front gable vernacular residence, with a bay window, and clad in horizontal siding. Part of the Historic Settlement Area of Claireville.
BHR 16	2119 Codlin Crescent	Identified during field review	One and one half storey front gable vernacular residence, with L-shaped plan, a bay window, and clad in horizontal siding. Part of the Historic Settlement Area of Claireville.
BHR 17	2150 Codlin Crescent	Identified during field review	Two storey side gable vernacular residence, with covered entranceway, and horizontal siding. Part of the Historic Settlement Area of Claireville.
BHR 18	2115 Codlin Crescent	Identified during field review	Two storey side gable vernacular residence, with covered entranceway, and clad in stucco. Part of the Historic Settlement Area of Claireville.
BHR 19	2140 Codlin Crescent	Identified during field review	One and one half storey Ontario Gothic cottage style residence, with centre gable peak, and clad in horizontal siding. Part of the Historic Settlement Area of Claireville.

FEATURE	LOCATION	RECOGNITION	DESCRIPTION/COMMENTS
BHR 20	2107 Codlin Crescent	Identified during field review	One storey side gable vernacular cottage. Part of the Historic Settlement Area of Claireville.
BHR 21	2128 Codlin Crescent	Identified during field review	Two and one half storey foursquare Edwardian residence, built with red brick, with a shingled gable, and covered front porch. Part of the Historic Settlement Area of Claireville.
BHR 22	2103 Codlin Crescent	Identified during field review	Two and one half storey foursquare Edwardian residence, built with red brick, with a shingled gable, and covered front porch. Part of the Historic Settlement Area of Claireville.
BHR 23	2095 Codlin Crescent	On the City of Toronto Register of Heritage Properties	Two storey vernacular farmhouse, with horizontal siding, and a covered front porch. Part of the Historic Settlement Area of Claireville.
CHL 1	Humber River	Designated Heritage River	The Humber River was designated a Canadian Heritage River as a part of the Canadian Heritage Rivers System in 1999, based on the outstanding river-related human heritage and recreational values of national significance.
CHL 2	7715 Kennedy Road, Brampton, Brampton	Listed, City of Brampton	Former farmhouse. Destroyed by fire in 2010. Remnant farmscape features have also been demolished.
CHL 3	Kennedy Road South, Brampton	Designation in progress	Identified as the Graham Pioneer Cemetery.
CHL 4	Kennedy Road South, Brampton	Listed, City of Brampton	The Kennedy Valley consists of walking trails, the Etobicoke Creek, and TRCA conservation lands.
CHL 5	7385 Farmhouse Court Tompkin Road	Listed, City of Brampton	A red brick Edwardian foursquare farmhouse, with a hipped roof, central dormer and covered verandah.
CHL 6	West side of Airport Road, south of Steeles Avenue East Grahamville Cemetery	Identified in the City of Brampton Heritage Register	A former pioneer cemetery, located within formal gates, fenced off from the surrounding commercial district, with rows of cemetery stones and memorials.
CHL 7	7324 Kennedy Road, Brampton	Identified during field review	This farmscape includes a nineteenth-century farm complex, including a two-storey colonial revival white brick farmhouse with a hipped roof.
CHL 8	7241 Jane St, Vaughan, ON	Identified during field review	Beechwood Cemetery is a contemporary cemetery, and has been open to the communities of the City of Vaughan and the neighbouring community of Downsview since 1965.
CHL 9	Various Rail Lines Throughout Study Area	Identified during field review	Nineteenth- and twentieth-century railscape.
CHL 10	Thackeray Park Cricket Ground, 2955 Kipling Avenue, Toronto	Identified during field review	Thackeray Park Cricket Ground opened on June 27, 2011. Previously a part of TRCA lands.
CHL 11	5670 Steeles Avenue, Vaughan	City of Vaughan Heritage Inventory – Registered	A one and one half storey Georgian style farmhouse with Neoclassical covered porch, and 6/6 wood windows. The property is obscured by mature trees, and consists of an agricultural landscape, including laneway, painted white fence, a collection of green barns and outbuildings with white roofs.
CHL 12	Queen of Heaven Catholic Cemetery, 7300 Highway 27, Vaughan	Identified during field review	A contemporary cemetery that consists of five grave sections, six shrines, a prayer garden, the stations of the cross, an office (which is in a former farmhouse), a service building, and two mausoleums: the Queen of Heaven Mausoleum and Saint Anthony's Mausoleum.
CHL 13	7141 Highway 50, Vaughan	City of Vaughan Heritage Inventory – Registered	A hybrid of Ontario Gothic and Regency styles. The central gable is a distinct Regency style, while the side gable and massing suggest an Ontario Gothic origin.
CHL 14	Claireville Conservation Area, 8180 Highway 50, Brampton	Identified during field review	Claireville Conservation Area is 848 acres of natural and forested area that straddles Peel Region and Toronto.
CHL 15	Codlin Crescent, formerly Albion Road and Steeles Avenue, Toronto	Identified during field review	Claireville was established in 1850 at the intersection of Albion Road and Steeles Avenue. The former hamlet of Claireville consists of Codlin Crescent, which includes the former alignment of the Albion Plank Road and Steeles Avenue, Toronto.

3.2.5. Archaeological Features

A Stage 1 Archaeological Assessment was conducted as per the 2011 *Standards and Guidelines for Consultant Archaeologists*, administered by the Ministry of Tourism, Culture and Sport. The Stage 1 Archaeological Assessment Report (March 2017) was submitted to the Ministry of Tourism, Culture and Sport, and the Ministry confirmed in a letter dated April 19, 2017 that this report was reviewed/entered into the Ontario Public Register of Archaeological Reports. The Stage 1 Archaeological Assessment Report is presented in **Appendix O of this EPR**. The mapping presented in this report was current as of March 2017 upon submission to the Ministry of Tourism, Culture and Sport and was updated based on the final Transitway design in the Stage 2 Archaeological Assessment Report (**Appendix P of this EPR**). The Stage 1 background research indicated that there are 72 previously registered archaeological sites located within 1 km of the project limits, 19 of which are located within 50 m of the project limits, and 13 of which are located within the immediate project limits. None of these archaeological sites are known ancestral Huron-Wendat village sites. Only two previously registered archaeological sites within the project limits were identified as retaining further cultural heritage value or interest (CHVI) and will require additional Stage 3 site specific archaeological assessment if impacted including AjGw-490 (James Cracker Site) and AkGv-121 (ROW site).

A Stage 1 property inspection took place on October 5 and 6, 2016 within the vicinity of the proposed stations and the preferred Transitway alignments. The property inspection determined that parts of the study area have been subject to deep and extensive land disturbance. These lands do not retain archaeological potential. The remainder of the 407 Transitway study area lands, however, do exhibit archaeological potential and require Stage 2 archaeological assessment (test pit or pedestrian survey at 5-metre intervals) prior to any impacts. The mapping in **Appendix P of this EPR** presents the lands within 300 m of watercourses/waterbodies as well as the lands beyond 300 m of watercourses/waterbodies retaining archaeological potential, and identifies the areas requiring further Stage 2 archaeological assessment. As part of this TPAP, a Stage 2 archaeological assessment (including test pit and pedestrian surveys) has been conducted only on lands retaining archaeological potenital (where permission to enter was secured) located within 300 m of watercourses/waterbodies to identify any sites/lands requiring further assessment (i.e. Stage 3 or Stage 4 Site Specific Archaeological Assessment). Any Stage 2 work not completed during the TPAP, and any required Stage 3 and Stage 4 work, will be completed prior to construction.

3.2.6. Noise and Vibration

EXISTING LAND USES

This 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.

In the first segment of the study area, eastward from west of Hurontario Street to Dixie Road overhead aircraft travelling to and from Lester B. Pearson International Airport (LBPIA) is a significant contributor

to the existing background noise environment. Road traffic is the other major contributor of noise as several heavily travelled roadways such as Hurontario Street, Kennedy Road and Highway 410 intersect the 407 ETR right-of-way (407 ROW). Land uses include residential subdivisions between McLaughlin Road and Kennedy Road on the north side of the 407 ETR, the Brampton Golf Club to the immediate north of the 407 ETR near Kennedy Road, and a mix of industrial establishments, and vacant undeveloped lands. So overall, this area can be considered as having a high ambient noise environment.

Moving eastward, large industrial and commercial land uses occupy most of the study area between Dixie Road and Airport Road, and these occupy the intervening space between the 407 ROW and any residential developments. The CNR/GO rail line crosses the 407 ETR east of Bramalea Road in this segment. In addition to road and rail traffic noise, this segment is also in the immediate vicinity of LBPIA and, as a result, frequent aircraft flyovers is a significant noise source. Similar to the previous segment, this area can be considered as having a high ambient noise environment.

Eastward from Airport Road to Highway 427, the study area is characterized by a mix of industrial establishments and vacant undeveloped lands. There are no existing residential subdivisions in close proximity to the study area in this segment; however, there are scattered single residences along less travelled municipal roads that the 407 ETR crosses. There are a number of single dwellings bounded by Albion Road/Highway 50 and Highway 427; however, these residences are expected to be replaced by one of the 407 Transitway stations. Aircraft flyover noise is one of the dominant noise sources in this segment of the study area, due to the relatively close proximity to LBPIA. Road traffic noise from the existing 407 ETR, Highway 427, and many heavily travelled streets such as Airport Road, Goreway Drive, Steeles Avenue East and Finch Avenue, is also dominant in this segment. A CN freight rail line also overpasses the 407 ROW, east of Airport Road. This segment also includes certain recreational facilities such as Wild Water Kingdom to the south of the 407 ETR.

Eastward from Highway 427 to Islington Avenue, the key land use features include a cemetery (Queen of Heaven Catholic Cemetery) close to Highway 27, commercial and industrial establishments, vacant undeveloped lands, a CPR freight rail line which crosses over the 407 ETR in a north-south direction, and a second rail line that runs parallel and south of the 407 and crosses the CPR line just west of Islington Avenue. This segment includes a residential subdivision along the south perimeter of the study area within the City of Toronto, in particular homes on Provence Trail/Minglehaze Drive, Ghion Spring, Kay Drive, etc.

The land uses adjacent to the proposed 407 Transitway within the City of Vaughan (and a small portion in the City of Toronto) consist mainly of a mixture of commercial, industrial, residential and transportation network (both road and rail) uses. Eastward from Islington Avenue to east of Highway 400, are several commercial and industrial establishments on both the north and south sides of the 407 ROW. There is a residential subdivision in close proximity to the study area between Islington Avenue and Pine Valley Drive, with homes fronting onto Terra Road and Timber Lane, with some backyards adjacent to the 407 ROW. Further north of the study area, along Highway 7, are other residential subdivisions, but these are well removed from the proposed 407 Transitway.

PREDOMINANT NOISE SOURCES

The existing noise environment within the study area is dominated by urban hum, primarily road traffic. The road network in the vicinity of the proposed 407 Transitway is extensive and includes major east-west roadways such as 407 ETR, Highway 7, and Steeles Avenue. Major north-south routes include Highway 400, Highway 27, Highway 427, Highway 410, Pine Valley Drive, Islington Avenue, Kipling Avenue, Martin Grove Road, Goreway Drive, Airport Road, Bramalea Road, Dixie Road, McLaughlin Road and Hurontario Street. All of these roads carry a high volume of traffic daily.

In addition to the road noise, aircraft noise is quite common because of the proximity of the study area to the LBPIA. Frequent aircraft flyovers is the norm, especially in the area west of Highway 427 to Hurontario Street.

As noted above, the study area is characterized by industrial and commercial developments which are the dominant land uses for the vast majority of the study area. These establishments are significant contributors to the existing noise environment in the study area. In addition to noise emanating from the operation of these facilities, many of these facilities have large parking lots and loading/unloading docks that are sources of traffic noise.

Freight and commuter rail are also contributors to the existing noise environment in the study area. The study area is crossed twice by such rail lines and includes Bramalea GO Station and parking lot.

The Noise Assessment – Existing Conditions Report (ARCADIS 2016) provides information on the relevant regulatory requirements, municipal noise by-laws and the project noise and vibration assessment criteria.

POINTS OF RECEPTION (RECEPTORS)

The MTO Protocol defines Noise Sensitive Areas (NSAs) and Outdoor Living Areas (OLSs). These NSAs and OLAs are considered receptors for the purposes of this assessment. As noted above, there are not many existing noise receptors within the study area, however, there is a potential for noise effects on these receptors because of their proximity to the proposed 407 Transitway.

The key existing receptor locations include:

- The residential subdivisions located to the immediate north of the westbound on-ramp from southbound Hurontario Street to westbound 407 ETR, and immediately north of the northbound off-ramp from 407 ETR to Hurontario Street. Residences on Cherrytree Drive, west of Hurontario Street and Blackmere Circle and Havelock Drive/Bloomingdale Drive east of Hurontario Street, are some of the closest in this section of the study area;
- The residential subdivision located at the south limits of the study area east of Highway 27 south (at Provence Trail, Minglehaze Drive). This area is located just south of a proposed station on Martin Grove Road; and,
- The residential subdivision to the immediate north of the westbound on-ramp from southbound Pine Valley Drive to 407 ETR. Residences on Terra Road are likely the closest. The backyards of

some of the residences in this area are adjacent to the 407 ROW.

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 Hurontario Street to Highway 50 the Corridor falls under the Regional Municipality of Peel jurisdiction. From Highway 50 to Highway 400 the Corridor falls under the Regional Municipality of York.

A grid network of arterial roads connects 407 ETR to adjacent land uses. The major transportation corridors within the study area include:

Hurontario Street – A major north-south six-lane arterial road connecting Downtown Brampton with Downton Mississauga. A median LRT is currently initiating the implementations stage.

Kennedy Road – A four-lane north to south arterial road located between the interchange crossings of Huronrtario Street and Highway 410, flying over 407 ETR.

Highway 410 – Major Provincial north to south highway connected to 407 ETR through a complete interchange.

Tomken Road – A four-lane north to south arterial road located east of Highway 410, flying over 407 ETR.

Dixie Road – A major north-south six-lane Regional road connected to 407 ETR through a complete interchange.

Bramalea Road – A four-lane north to south arterial road connected to 407 ETR through a partial interchange.

Torbram Road – A four-lane north to south road located east of Highway 410, flying over 407 ETR.

Airport Road – A major north-south six-lane Regional road connected to 407 ETR through a complete interchange.

Gorewood Drive – A four-lane north to south road located east of Highway 410, flying over 407 ETR.

Highway 50 – A major four-lane north to south Regional Road, flying over 407 ETR.

Highway 427 – Major Provincial north to south highway connected to 407 ETR through a complete interchange. Connection to 427 Transitway Terminus Station Just south of the ETR Interchange.

Highway 27 – A major six-lane north to south highway connected to 407 ETR through a complete interchange.

Martin Grove Road – A four-lane north to south arterial road. No connection to 407 ETR.

Islington Avenue – Road ends on either side of 407 ETR. Feasibility of future Interchange being studies by MTO and ETR.

Pine Valley Drive – A major four-lane north to south arterial road connected to 407 ETR through a complete interchange.

Weston Road – A major six-lane north to south arterial road connected to 407 ETR through a complete interchange.

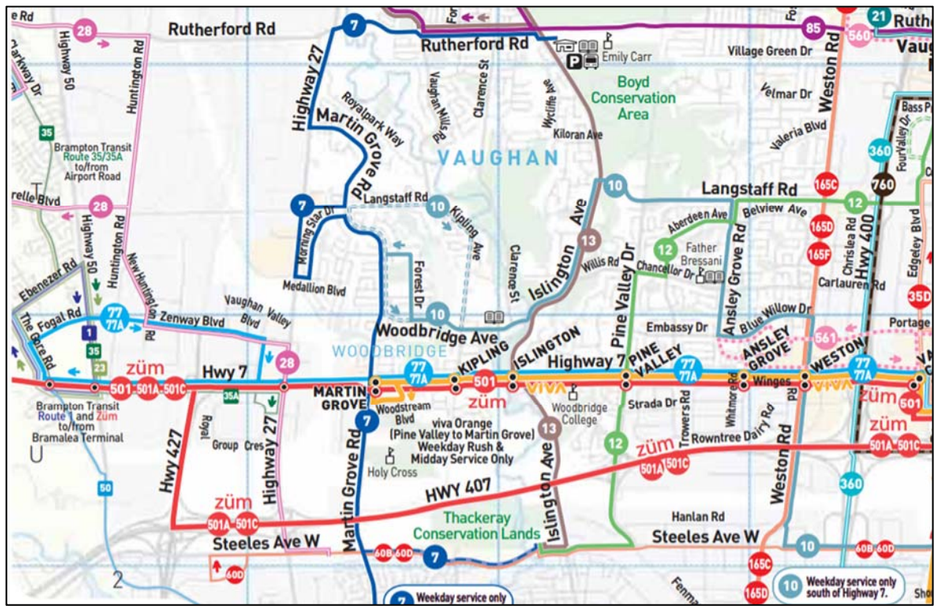
Highway 400 – **Highway 410** – Major Provincial north to south highway connected to 407 ETR through a complete interchange.

Steeles Avenue – A major east-west six-lane arterial road located in the boundary of City of Toronto and York and Peel Region. Steeles Avenue will have significant use by 407 Transitway commuters, between Airport Road and Pine Valley Drive.

3.3.2. Transit Services within the Study Area

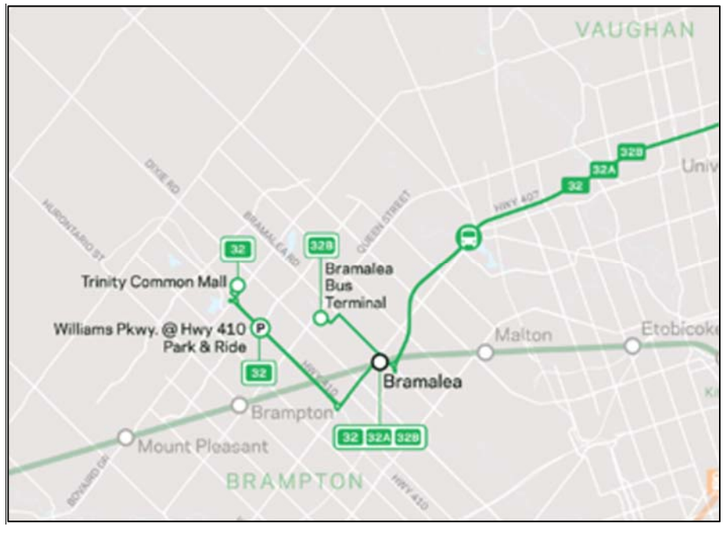
The four transit operators in the area include GO Transit, MiWay, Brampton Transit, and the TTC are currently providing transit services in the 407 ETR Corridor and adjacent areas. These services connect to other rapid transit services such as TTC Subway lines, GO Rail lines and VIVA services as well as major activity centers including employment and commercial centers and post-secondary schools in the GTA. Existing services are illustrated in **Figures 3.6 to 3.8**.

FIGURE 3.5: EXISTING YRT & TTC SERVICES IN 407 TRANSITWAY AREA



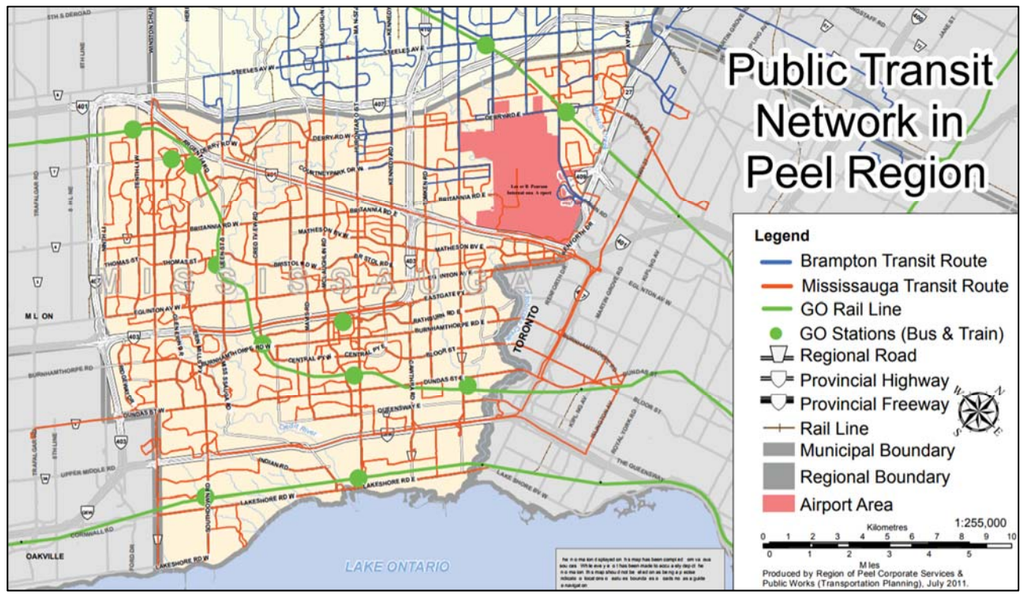
Source: York Region Transit System Map (September 2017)

FIGURE 3.6: EXISTING GO TRANSIT BUS AND TRAIN SERVICES IN THE CITY OF BRAMPTON



Source: Go Transit 407 East Bus Map (September 2017)

FIGURE 3.7: EXISTING PUBLIC TRANSIT NETWORK FOR PEEL REGION



Source: Peel Region Transportation Fact Sheet (July 2011)

3.3.3. Brampton Transit

Brampton Transit operates local, express and Züm Bus Rapid Transit routes near and along the Highway 407 ETR Corridor. Following the 2010 launch of the Queen Street Züm, four addition routes were launched to meet the needs for service with Züm Main Street, Züm Steeles Avenue, Züm Bovaird Drive and Züm Queen Street West. Inclusive of the Züm BRT service, Brampton Transit operates 65 routes with express routes to the Airport, local school routes. Currently there are numerous Züm and local routes near along and intersecting Highway 407 ETR Corridor. A full list of routes are shown in table below. New Transitway services will need to be planned and coordinated with the Züm routes and local services to provide effective first and last mile options and to ensure the Transitway serves distinct trip markets that are not redundant and to avoid competing with other agencies. While Züm serves local trips within Brampton, services on the 407 Transitway are anticipated to serve a regional purpose focused on long distance and regional travel. A full list of routes are shown in **Table 3.10**.

TABLE 3.10: EXISTING BRAMPTON TRANSIT SERVICE

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
502 Züm Main	Mississauga City Centre Terminal	Sandalwood Loop
511 511a Züm Steeles	Lisgar Go Station	Humber College
501A Züm Queen	Downtown Terminal	York University
#2 Main	Hwy 407 Go Park and Ride	Heart Lake Terminal

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
#7 & 7A Kennedy	Hurontario St and Courtneypark Dr	Mayfield Rd & Hurontario St.
#18 Dixie	Dixie Rd a& Meyerside Drive	Countryside Dr and Fernforest Dr
#185 Dixie Express	Dixie Transitway Station	Bramalea Terminal
#15 Bramalea	Telford Way and Tranmere Drive	Bramlea Rd & Inspire Blvd
#14 Torbram	Westwood Mall Terminal	Torbram Rd & Father Tobin Rd
#5 & 5A Bovaird	Mount Please GO Station	Westwood Mall Terminal
#30 Airport Rd	Westwood Mall Terminal	AMB Distribution Centre
#11 & 11A Steeles	Lisgar GO Station	Humber College
#50 Gore Rd	Humber College	Gore Meadows Community Centre
#115 Airport Express	Pearson Airport –Terminal 1	Bramalea Terminal
#29 A Williams	Mount Pleasant GO	Goreway Dr & Kenview Blvd
#6 James Potter	Hwy 407 Park & Ride	James Potter Rd & Queens St W
#58 Financial	Steeles Ave & Financial Dr	Financial Dr and Derry Rd (loop)
#51 Hereford	Hereford St & Steeles Ave	Brampton Gateway Terminal
#60 Mississauga Rd	Derry Rd & Financial D	Mount Pleasant GO Station
#20A East Industrial	Bramalea Terminal	Driver Rd & Airport Rd

3.3.4. Mississauga Transit (MiWay)

MiWay is the third largest municipal transit service provider in Ontario with over 85 bus routes offering both local and express bus services, MiLocal and MiExpress, throughout Mississauga. MiWay also provides BRT service on the Mississauga Transitway which runs, for the most part, parallel to Highway 403 and extends from Winston Churchill Boulevard in the west to Renforth Drive in the east. MiWay routes connect with GO Transit, TTC, Brampton Transit, and Oakville Transit. Some of MiWay routes are near or intersect at the Highway 407 ETR Corridor. New Transitway service will need to be planned and coordinated with the MiWay local and express routes to provide effective first and last mile options and to ensure the Transitway serves distinct trip markets that are not redundant and to avoid competing with other agencies. While MiWay routes serve local trips within Mississauga, services on the 407 Transitway are anticipated to serve a regional purpose focused on long distance and regional travel. A full list of routes are shown in **Table 3.11**.

TABLE 3.11: EXISTING MIWAY SERVICE

INTERSECTING ROUTE/ NAME	ORIGINATES FROM	DESTINATION
#61A Mavis Sheridan	City Centre Transit Terminal	Sheridan College
66 McLaughlin	City Centre Transit Terminal	Sheridan College
103 Hurontario Express	Port Credit GO Station	Brampton Gateway Terminal
185 Dixie Express	Dixie Transitway Station	Bramalea Terminal
38 Creditview	Cedarglen Gate	Meadowvale Town Centre

3.3.5. Toronto Transit Commission

In the area of influence of the 407 Transitway project, the TTC is responsible for services in the City of Toronto (i.e. south of Steeles Avenue and along Steeles Avenue). The TTC also operates several routes on major north-south arterials north of Steeles Avenue in York Region. These services are operated under contract to York Region, with two routes in the study area:

Major routes that may connect to the 407 Transitway include:

- Routes 60 B and 60 D, which travel along Steeles Avenue;
- Route 50 along Gore Road;
- Route 28 along Highway 27;
- Route 7 along Martin Grove;
- Route 13 along Islington; and,
- Route 12 along Pine Valley Drive.

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.