



Technical Memorandum

To: The Regional Municipality of Peel
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From: Amec Foster Wheeler Environment & Infrastructure

cc: Neal Smith, Civil Technician
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Ref: TP115085

Date: May 4, 2017

Re: **Widening of Mississauga Road from Bovaird Drive West to Queen Street West, Brampton, Ontario, Natural Environment Existing Conditions - Support for the EA Addendum**

1.0 PROJECT OVERVIEW

To meet existing and future needs, the Regional Municipality of Peel is proposing the widening of approximately 2.8 kilometres (km) of Mississauga Road (Regional Road 1) within the City of Brampton (Figure 1). This project has a previously approved Schedule 'C' Municipal Class Environmental Assessment (EA) and requires updates to support additional work related to widening Mississauga Road from five lanes to six lanes. These additional works will result in a greater area of impact on the west side of Mississauga Road. This technical memorandum is provided as natural sciences support for an Addendum to the previously approved EA.

Aquatic habitat is present within Huttonville Creek, which is flowing parallel and adjacent to the east shoulder of Mississauga Road. Construction activity is presently ongoing along Mississauga Road at the intersection of Bovaird Drive West, and in areas south of the intersection. A retaining wall is currently being constructed on the east side of Mississauga Road; works which have been granted an MNRF Overall Benefit permit for Redside Dace. The proposed work outlined in the current improvements will not impact the east side of Mississauga Road in the area adjacent to Huttonville Creek.

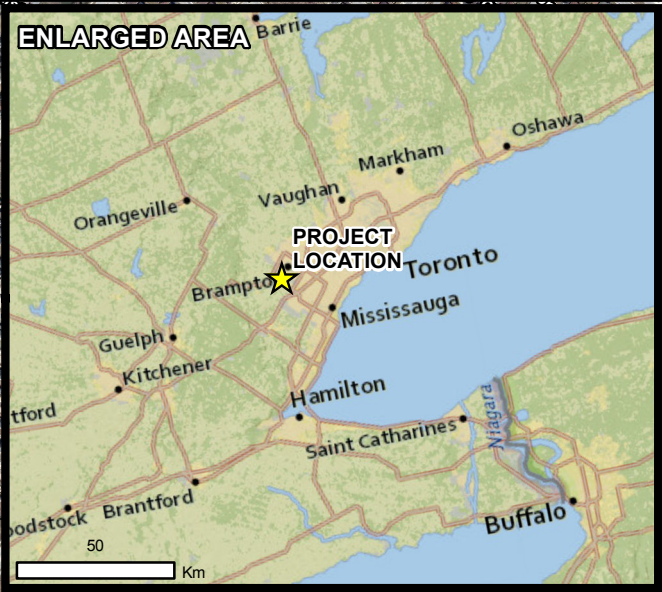
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Path: P:\2015\Projects_Other\TP115085_Region of Peel Widening of Mississauga Road09_CIS\MXD\Location2_Project_Location_1.mxd, Author: Sandra Marquez, modified by monica.deveau, 16 November 2016

LEGEND

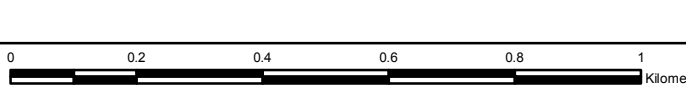
- Watercourse Crossing
- Study Area (120m Buffer)
- Permanent Watercourse
- Intermittent Watercourse
- Culvert / Bridge

NOTES:
 - Background imagery from City of Brampton, Spring 2016
 - Topographic features extracted from LIO, MNRF.



MISSISSAUGA ROAD WIDENING PROJECT

Project Location



Datum & Projection:
 NAD 1983 UTM Zone 17N



PROJECT N^o: TP115085

FIGURE: 1

SCALE: 1:12,000

DATE: November 2016

1.1 Study Area

Mississauga Road is a north-south arterial road under the jurisdiction of the Regional Municipality of Peel. The project area extends approximately 2.8 km from 150 m north of Queen Street West (Regional Road 6) to 100 m south of Bovaird Drive West (Regional Road 107) and is located within the Credit River watershed under the jurisdiction of the Credit Valley Conservation Authority (CVC) and Aurora District Ministry of Natural Resources and Forestry (MNR) (Figure 1).

The terrestrial study area includes lands extending 120 m beyond the Mississauga Road right-of-way (ROW) along the length of project area described above and as illustrated in Figure 1.

2.0 METHODOLOGY

Field data was collected by Amec Foster Wheeler on September 30 and October 3, 2016, and supplementary data has been included from the Natural Heritage Report prepared by LGL Limited Environmental Research Associates (LGL) in April 2006 and other secondary sources. Field investigations were conducted in 2016 to confirm previous reporting and to identify any land use changes that may have occurred, in order to determine the significance and sensitivity of existing habitats and any potential constraints to the design.

Secondary source information and data from field investigations were used to map vegetation communities and determine the probability for Species at Risk (SAR) and Significant Natural Area presence.

2.1 Secondary Source Review

Secondary sources and databases were reviewed to ascertain fish community, aquatic habitat, vegetation community, terrestrial habitat, and SAR data within the project limits and within the surrounding area. Information provided by external agencies, publicly-available topographic data, and correspondence with external agencies have also been included herein. Sources for background data review included:

- CVC publications and online data:
 - CVC website (CVC 2016);
 - Credit River Fisheries Management Plan (MNR and CVC 2002); and
 - Credit River Water Management Strategy Update (CVC 2007).
- Reporting for projects conducted in the area:
 - *Natural Heritage Report: Mississauga Road from Queen Street to Bovaird Drive* (LGL 2006); and
 - *Phase 1: Subwatershed Characterization and Integration* (AMEC 2010).
- Aerial imagery from Bing Maps (Bing 2016);
- Species occurrence and natural heritage feature records extracted from the MNR's Natural Heritage Information Centre (NHIC) including seven 1 km² squares encompassing the project area – 17NJ9435, 17NJ9535, 17NJ9434, 17NJ9534, 17NJ9634, 17NJ9533, and 17NJ9633 (MNR 2015);

- Correspondence with the Aurora District MNRF;
- Fisheries and Oceans Canada's (DFO) Distribution of Aquatic SAR mapping (DFO 2015);
- Topographic data extracted from Land Information Ontario (Government of Ontario 2015); and
- Complementary topographic data from the Regional Municipality of Peel and Mississauga City under an Open Data License.

2.2 Field Inventories

To augment secondary source information, Amec Foster Wheeler conducted terrestrial and aquatic confirmatory field investigations on September 30 and October 3, 2016. Three drainage features occur within the 120 m study area, of which two drainage features flow parallel to Mississauga Road and one crosses under Mississauga Road (Crossing C1). Previous studies have concluded that the drainage feature at Crossing C1 does not provide fish habitat and is considered cross drainage. As such, fish sampling and habitat mapping was not conducted during the 2016 field investigation.

As a component of confirmatory terrestrial data collection, wetland and vegetation community mapping (Ecological Land Classification; ELC) surveys were undertaken.

3.0 POTENTIAL CONSTRAINTS

3.1 Aquatic Species at Risk

Historic fish collection data and correspondence with the MNRF indicate that Huttonville Creek is listed as 'occupied' by Redside Dace (*Clinostomus elongatus*), a provincially Endangered species (Appendix A).

Redside Dace require good clarity and coolwater thermal regimes with a distribution of riffles and pools (MNRF 2010). They are sensitive to warming water and increased sedimentation. Feeding opportunities are enhanced by overhanging streamside vegetation which provide falling or hanging invertebrates. Typically, agriculture and activities that remove riparian vegetation ultimately increase the input of pollutants to streams, increase sedimentation, and result in increased water temperatures. Individually and collectively these factors can have negative impacts on Redside Dace populations.

As a component of ongoing construction at Mississauga Road and Bovaird Drive West, an Overall Benefit Permit for Redside Dace within Huttonville Creek had been granted by the MNRF. For the addendum works, the primary concern will be the protection of Redside Dace and their protected habitat located east of the site and located immediately downstream of Crossing C1. Other cross drainage culverts will also require general environmental protection measures located along Mississauga Road within the section of works located adjacent to Huttonville Creek.

Refer to Section 7.0 for details related to mitigation measures to protect Redside Dace and other resident species within the adjacent watercourse.

3.2 Terrestrial Species at Risk

MNRF has confirmed that nine terrestrial SAR were recorded for the study area: two plant species, four bird species, and three reptile species (Appendix A). MNRF records also indicate six additional SAR have the potential to occur within the vicinity of the study area: three mammal species, two bird species, and one invertebrate (Appendix A). NHIC searches within the seven natural heritage squares (1km x 1km) which encompass the terrestrial study area did not include any additional SAR.

With the exception of one reptile, Eastern Milksnake (*Lampropeltis triangulum*) which has been down-listed and is no longer listed under the ESA, each of the SAR reported by MNRF and NHIC are included in Table 1. This table includes a brief description of each species' preferred habitat and their probability of occurrence within the study area.

Field investigations completed by LGL (2006) did not report any additional plant or wildlife SAR beyond those which were already indicated by previously listed secondary sources.

The probabilities provided in Table 1 are based on an assessment of each species' habitat preferences/needs in conjunction with existing conditions observed during 2016 field investigations and background information. These findings do not confirm presence or absence from the site. Furthermore, additional SAR may come into the area or species already occurring in the area may be up-listed at any time. For this reason, ongoing communication with the MNRF is strongly recommended to ensure compliance with the ESA.

Species with a High probability of occurrence are those recorded in the vicinity of the project (typically within 10 km and recorded in the past 20 years) and whose preferred habitat is abundant within the study area. Species with High probability of occurrence would be expected to breed within or frequently use the habitats available within the study area and would be known to have a high relative abundance within the region of the study area (i.e. compared to other regions in Ontario).

Species with a Moderate probability of occurrence are those recorded in the vicinity of the project but have limited suitable habitat within the study area. Species with Moderate probabilities of occurrence may not occur within the study area frequently but may intermittently use it for foraging, migration or movement to other parts of their home-range.

Species with a Low probability of occurrence are those recorded in the vicinity of the project and whose preferred habitat does not occur or is extremely limited within the study area. These species may intermittently move through the study area but are unlikely to become permanent residents.

Table 1: Records of Terrestrial and Semi-Terrestrial Wildlife Species at Risk within the Vicinity of the Project and Probability of Occurrence

Species Name and Status (ESA, 2007)	Probability of Occurrence within the Study Area
Birds	
Eastern Meadowlark <i>(Sturnella magna)</i> Threatened Record Source: MNRF Correspondence and NHIC record	Low/Moderate - Reported in the study area by MNRF. Eastern Meadowlark is designated as Threatened by COSEWIC. As a ground nesting grassland specialist, the Eastern Meadowlark inhabits grassland habitats, native prairies and savannahs, as well as non-native pastures, hayfields, weedy meadows, herbaceous fencerows and airfields (COSEWIC 2011b). There is limited suitable habitat within the study area so there is a low probability of this species using the habitats available.
Bobolink <i>(Dolichonyx oryzivorus)</i> Threatened Record Source: MNRF Correspondence and NHIC record	Low/Moderate - Reported in the study area by MNRF. Originally the Bobolink nested in tallgrass prairies of south-central Canada. Most of tallgrass prairie lands have been converted for agricultural use and the Bobolink has adapted to nesting in forage crops. This species also occurs in various grassland habitats such as wet prairie, graminoid peatlands, abandoned fields dominated by tall grasses, and remnants of uncultivated virgin prairie (COSEWIC 2010). There is limited suitable habitat within the study area so there is a low probability of this species using the habitats available.
Chimney Swift <i>(Chaetura pelagica)</i> Threatened Record Source: MNRF Correspondence	Low - Reported in the study area by MNRF and was not reported during Amec Foster Wheeler field investigations. Due to the land clearing associated with colonization, hollow trees became increasingly rare, which led Chimney Swifts to move into house chimneys. Today, the species is mainly associated with areas where the birds can find chimneys to use as nesting and resting sites, however, it is likely that a small portion of the population continues to use hollow trees. Within the study area, Chimney Swifts have limited access to chimneys (COSEWIC 2007a).
Barn Swallow <i>(Hirundo rustica)</i> Threatened Record Source: MNRF Correspondence	High - Reported in the study area by MNRF. Barn Swallow is listed as Threatened under the ESA and designated as Threatened by COSEWIC. Similar to the Chimney Swift, the Barn Swallow has become closely associated with human settlements. Barn Swallows have shifted largely to nesting in and on artificial structures, including garages, houses, bridges and road culverts, and prefer various open habitats for foraging including grassy fields, pastures, agricultural crops, and cleared ROW (COSEWIC 2011a). The majority of the study area is suitable habitat with cleared ROW, road culverts and artificial structures.
Bank Swallow <i>(Riparia riparia)</i> Threatened Record Source: MNRF Correspondence	Moderate – Reported as potentially in the study area by MNRF. The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods (COSEWIC, 2013). Suitable habitat exists for this species within the study area.
Peregrine Falcon <i>(Falco peregrinus)</i> Special Concern Record Source: MNRF Correspondence	Low - Reported as potentially in the study area by MNRF. Peregrine Falcons naturally nest on ledges found on vertical cliff faces, yet will also utilize man-made structures such as tall buildings or bridges. In Ontario, suitable vertical faces are generally 50-200m tall and typically overlook water and forested areas (Ontario Peregrine Falcon Recovery Team, 2010). Nests are created as existing vegetation or soil on a ledge is scraped away or flattened, leaving a bare depression in which eggs are laid. Nests are generally found on the upper one third of the cliff face This species may periodically use the study area to hunt however there is no suitable nesting habitat present.

Species Name and Status (ESA, 2007)	Probability of Occurrence within the Study Area
<u>Mammals</u>	
Eastern Small-footed Myotis <i>(Myotis leibii)</i> Endangered Record Source: MNRF Correspondence	Low/Moderate – The Eastern Small-footed Bat is one of the less common species found to hibernate in Ontario. Caves and mines serve as significant hibernacula while streams and ponds serve as foraging areas. The lack of caves, mines, and the limited woodlands within the study area indicate that the probability of these species finding a home in the study area is Low; however, they may be seen foraging over open fields or local watercourses (MNR 2016a).
Little Brown Myotis <i>(Myotis lucifugus)</i> Endangered Record Source: MNRF Correspondence	High - The Little Brown Bat is wide-spread throughout the southern half of Canada and is especially associated with humans, often forming nursery colonies in buildings, attics, and other man-made structures (BCI 2016). Little Brown Bats forage over water where their diet consists of aquatic insects, mainly midges, mosquitoes, mayflies, and caddisflies. They also feed over forest trails, cliff faces, meadows, and farmland where they consume a wide variety of insects, from moths and beetles to crane flies (BCI 2016).
Northern Myotis <i>(Myotis septentrionalis)</i> Endangered Record Source: MNRF Correspondence	Low/Moderate - The Northern Long-eared Bat is one of the less common species found to hibernate in Ontario. This species is closely associated with woodlands and use trees as maternity sites. The lack of caves, mines, and the limited woodlands within the study area indicate that the probability of these species finding a home in the study area is Low; however, they may be seen foraging over local watercourses (MNR 2016a).
<u>Reptiles</u>	
Northern Map Turtle <i>(Graptemys geographica)</i> Special Concern Record source: MNRF Correspondence	Low – Reported in the study area by MNRF. The Northern Map Turtle occupies rivers, lakes, streams, and creeks that are well-oxygenated. The habitat must also contain suitable basking sites that are adjacent to deep water and provide an unobstructed view (COSEWIC 2012). This species has a low probability of occurrence.
Snapping Turtle <i>(Chelydra serpentina)</i> ; Special Concern Record Source: MNRF Correspondence	Moderate – Reported in the study area by MNRF. The preferred habitat for the Snapping Turtle is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Females generally nest on sand and gravel banks along waterways (COSEWIC 2008). Within the study area, the sediment of the Credit River is primarily a mix of boulders, cobble, and gravel and is not well suited to Snapping Turtles preferences. This species may pass through the area but it is unlikely to be present within the study area or in the terrestrial habitat immediately adjacent to it.
<u>Invertebrates</u>	
Monarch <i>(Danaus plexippus)</i> Special Concern Record Source: MNRF Correspondence	High – This species has been observed in the vicinity of the study area based on MNRF Correspondence. The primary food source of this species (when in its caterpillar life stage) is Common Milkweed (MNRF 2016a).
<u>Plants</u>	
Butternut <i>(Juglans cinerea)</i> Endangered Record Source: MNRF Correspondence and NHIC record	Low – MNRF records report the presence of Butternut and there are recent records of reported by NHIC element occurrences within 1km of the study area (MNR 2013). An Amec Foster Wheeler specialist surveyed the study area from the ROW for Butternut and did not report any findings. Butternut is widespread and relatively common in southern Ontario (more than 100 occurrences). Populations of this species are being devastated throughout its natural range by a fungal disease known as Butternut Canker (MNR 2013). It is possible this species exists within the study area outside the ROW.

Species Name and Status (ESA, 2007)	Probability of Occurrence within the Study Area
American Chestnut (<i>Castanea dentata</i>) Endangered Record Source: MNRF Correspondence	Low - MNRF records report the presence of American Chestnut. An Amec Foster Wheeler specialist surveyed the study area from the ROW for American Chestnut and did not report any findings. It is possible this species exists within the study area outside the ROW.

3.3 Significant Natural Areas

Secondary source review and correspondence with the MNRF regarding natural heritage information revealed that there are a number of significant natural areas in the vicinity of the project area. Those within the extents of the area covered by Figure 2 have been delineated.

- Occupied Redside Dace habitat: Huttonville Creek;
 - Huttonville Creek flows on the east side of and parallel to Mississauga Road for approximately 500 m (Figure 2). Cross drainage conveyed under crossing C1 flows approximately 25 m downstream before discharging into Huttonville Creek. This cross drainage feature was not listed as 'contributing' habitat.
- Andrew McCandless Park;
 - The City has begun construction of the Andrew McCandless Park on the southeast corner of Mississauga Road and Bovaird Drive West. It is expected to be completed by summer 2017. The park includes part of Huttonville Creek and construction will also focus on the naturalization and rehabilitation of the creek (City of Brampton 2016).
- Provincially-Significant Churchville-Norval Wetland Complex;
 - A portion of this wetland complex, approximately 300 m long, is located adjacent to Mississauga Road. The wetland is associated with the unnamed tributary of the Credit River on the west side of Mississauga Road approximately 300 m north of Queen Street (Figure 2). The Churchville-Norval Wetland Complex covers 47 hectares and is comprised of marsh (67%; frequently or continually inundated with water and characterized by emergent herbaceous vegetation) and swamp (33%; dominated by woody plants). The Churchville-Norval Wetland Complex is one of the few remaining wetlands on the Peel Plain (CVC 2007).
- Huttonville Creek and Area Wetland Complex;
 - Beginning in 2005, the Ministry of Natural Resources conducted wetland inventories and field work in the North West Brampton Area and vicinity - including the Huttonville Creek and Area Wetlands (AMEC 2010). It is assumed that this wetland complex is located adjacent to and/or in-line with Huttonville Creek, in which case it will not be impacted by project works.
- Locally Significant Springbrook Wetland Complex;
 - Located approximately 1.6 km northeast of the project area and not shown in Figure 2.
- Regionally Significant Georgetown Credit Valley ANSI.
 - Located approximately 3.6 km west of the project area and not shown in Figure 2.

- Unnamed Park
 - One small area on the east side of Mississauga Road, north of the Queen Street West intersection is designated as parkland. Remnants of parkland are also located on the west side of Mississauga Road adjacent to the unnamed tributary of the Credit River and the Churchville-Norval Wetland Complex, as well as further north of Queen Street West in the residential area.
- Unnamed Woodlands
 - Two small unnamed woodlands are located within the terrestrial study area. One is located on the east side of Mississauga Road near the center of the project and identified as Cultural Woodland (CUW1; Figure 3b). The other woodland is on the west side of Mississauga Road near the Queen Street West intersection (i.e., at the southern end of the project). This wooded area is a complex of classifications including Fresh-Moist Lowland Deciduous Forest Ecosite, Fresh-Moist Black Walnut Lowland Deciduous Forest, Dry-Fresh Oak-Hickory Deciduous Forest Type, and Mineral Meadow Marsh Ecosite (FOD7, FOD7-4, FOD2-2, and MAM2 respectively; Lee et. al. 1998). The later woodlot also overlaps with the unnamed park and the Churchville-Norval Wetland Complex mentioned above.

As project works will be limited to the west side of Mississauga Road, project works only have the potential to impact the following areas:

- The unnamed woodland near the middle of the project on the east side of Mississauga Road;
- The Provincially-Significant Churchville-Norval Wetland Complex;
- An unnamed park; and
- An unnamed woodland which overlaps the southwest end of the study area.

To ensure the necessary protection of these areas, further consultations with the MNRF and CVC may be necessary. During Detailed Design, a detailed assessment of potential impacts should be undertaken and site-specific mitigation measures developed.

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17NJ9434
Bobolink
Redside Dace

17NJ9534
Redside Dace

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Redside Dace

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Redside Dace
Butternut

17NJ9633
Eastern Meadowlark
Redside Dace
Butternut

LEGEND

- Study Area (120m Buffer)
- Watercourse Crossing
- NHIC Squares
(SAR species observed within the past 20 years)
- Environmentally Sensitive Area (CVC)
- Provincially Significant Wetland
- Non-evaluated Wetland
- Credit Valley Conservation Authority Regulation Area
- Park
- Woodland
- Greenbelt
- 2015 Occupied or Recovery Reaches for Redside Dace
- Permanent Watercourse
- Intermittent Watercourse
- Culvert / Bridge
- Waterbody

NOTES:
 - Background imagery from Bing Maps.
 - Topographic features extracted from LIO, MNR.
 - SAR information extracted from NHIC database 2015.
 - Georeferenced data representation of Regulation Limits derived from CVC, MNR.
 - Topographic features extracted from LIO, MNR.
 - Complementary topographic data from Peel Region and Mississauga City under Open Data Licence.

Datum & Projection:
NAD 1983 UTM Zone 17N



MISSISSAUGA ROAD WIDENING PROJECT

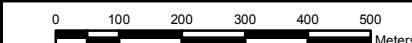
Significant Natural Areas and SAR Locations

PROJECT N^o: TP115085

FIGURE: 2

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DATE: November 2016



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4.0 AQUATIC HABITAT

This project is located in the Credit River watershed and Huttonville Creek subwatershed. Crossing C1 is the only drainage feature which crosses under Mississauga Road within the project limits and drains into Huttonville Creek. Huttonville Creek and an unnamed tributary of the Credit River run parallel and beyond 10 m of the project area (Figure 1). As such, the subsections below provide a brief summary of the aquatic habitat associated with these three drainage features based on secondary source information.

LGL conducted a survey on June 1, 2005 to document aquatic habitat and the potential fish communities within the study area. LGL reports that it was apparent that only one of the three watercourses (Huttonville Creek) mentioned above contained direct fish habitat (i.e., fish were seen/captured). Several fish sampling events have occurred in Huttonville Creek in close proximity to the project area, with the oldest collection occurring in 1982 and the most recent in 2002.

4.1 Huttonville Creek

Huttonville Creek provides direct fish habitat and is designated as a “small, warmwater community” management zone with an existing fish community designation of “warmwater community (dominated by Cyprinids)” (MNR and CVC 2002). Within the 120 m study area Huttonville Creek exhibits low valley slopes, semi-permanent flow conditions, poor overhead riparian shading and substrates ranging from silt to gravel (LGL 2006).

Within Huttonville Creek ten species and one unidentified cyprinid were captured during previous sampling events (Table 2). There were six historical collections between 1982 and 1995. During each collection Redside Dace were captured. In 2002, no Redside Dace were captured. In addition, juvenile Rainbow Trout (*Oncorhynchus mykiss*), a migratory salmonid species, were captured at three of the historical stations. The *Credit River Fisheries Management Plan* (MNR and CVC 2002) also notes that there is potential for Brook Trout (*Salvelinus fontinalis*) habitat within Huttonville Creek but historic records do not report presence of this species.

Table 2: Fish Collected Historically in Huttonville Creek near Mississauga Road

Common Name	Scientific Name	Provincial Status ¹
Blacknose Dace	<i>Rhinichthys atratulus</i>	S5
Brook Stickleback	<i>Culaea inconstans</i>	S5
Creek Chub	<i>Semotilus atromaculatus</i>	S5
Fathead Minnow	<i>Pimephales promelas</i>	S5
Longnose Dace	<i>Rhinichthys cataractae</i>	S5
Northern Hog Sucker	<i>Hypentelium nigricans</i>	S4
Northern Redbelly Dace	<i>Phoxinus eos</i>	S5
Rainbow Trout	<i>Oncorhynchus mykiss</i>	SE
Redside Dace*	<i>Clinostomus elongatus</i>	S3
Unidentified Cyprinid	Cyprinidae	
White Sucker	<i>Catostomus commersoni</i>	S5

Source: LGL 2006

*indicates provincially endangered species (protected under ESA, 2007)

¹ S1 = Extremely Rare S2 = Very Rare S3 = Rare to Uncommon
 S4 = Common S5 = Very Common SE = Exotic

4.2 Ephemeral drainage to Huttonville Creek (Crossing C1)

Huttonville Creek, is designated as a “small, warmwater community” management zone with an undetermined existing fish community in the Credit River management plan (MNR and CVC 2002). During LGL field investigations this ephemeral drainage feature was classified as not providing fish habitat (direct or indirect). MNRF has confirmed that this drainage feature does not provide contributing habitat to Redside Dace within Huttonville Creek (MNRF 2016; pers. comm.).

The tributary was dry at the time of LGL’s field investigation (June 1, 2005) and it was expected to exhibit intermittent flow. This tributary passes under Mississauga Road through a small diameter corrugated steel pipe culvert and has recently been replaced with a concrete box culvert (900 mm rise x 1800 mm span x 43 m long). The surrounding land use, on the west side of Mississauga Road, is primarily agricultural with recreational land use on the north side of the tributary (LGL 2006). This channel is dry as a result of adjacent land uses (LGL 2006).

4.3 Unnamed Tributary of the Credit River

The unnamed tributary of the Credit River was identified during LGL field investigations (June 1, 2005) as indirect fish habitat. The tributary contributes flow to downstream fish habitat, and similarly to Huttonville Creek, is also designated as a “small, warmwater community” management zone with an undesignated existing fish community in the Credit River management plan (MNR and CVC 2002). In the areas where the tributary is flowing adjacent to and in close proximity to Mississauga Road the channel is entrenched in select reaches and is braided in other reaches where the water flows through emergent vegetation. Further downstream where the tributary is reaching the southern limits of the study area and the tributary starts to flow within the Credit River valley, the riparian habitat is forested and the gradient increases and substrates become coarser. At the time of LGL’s 2005 field investigation, a barrier to fish passage was present near the tributary’s confluence with the Credit River (LGL 2006).

5.0 TERRESTRIAL HABITAT

5.1 Physiography and Soils

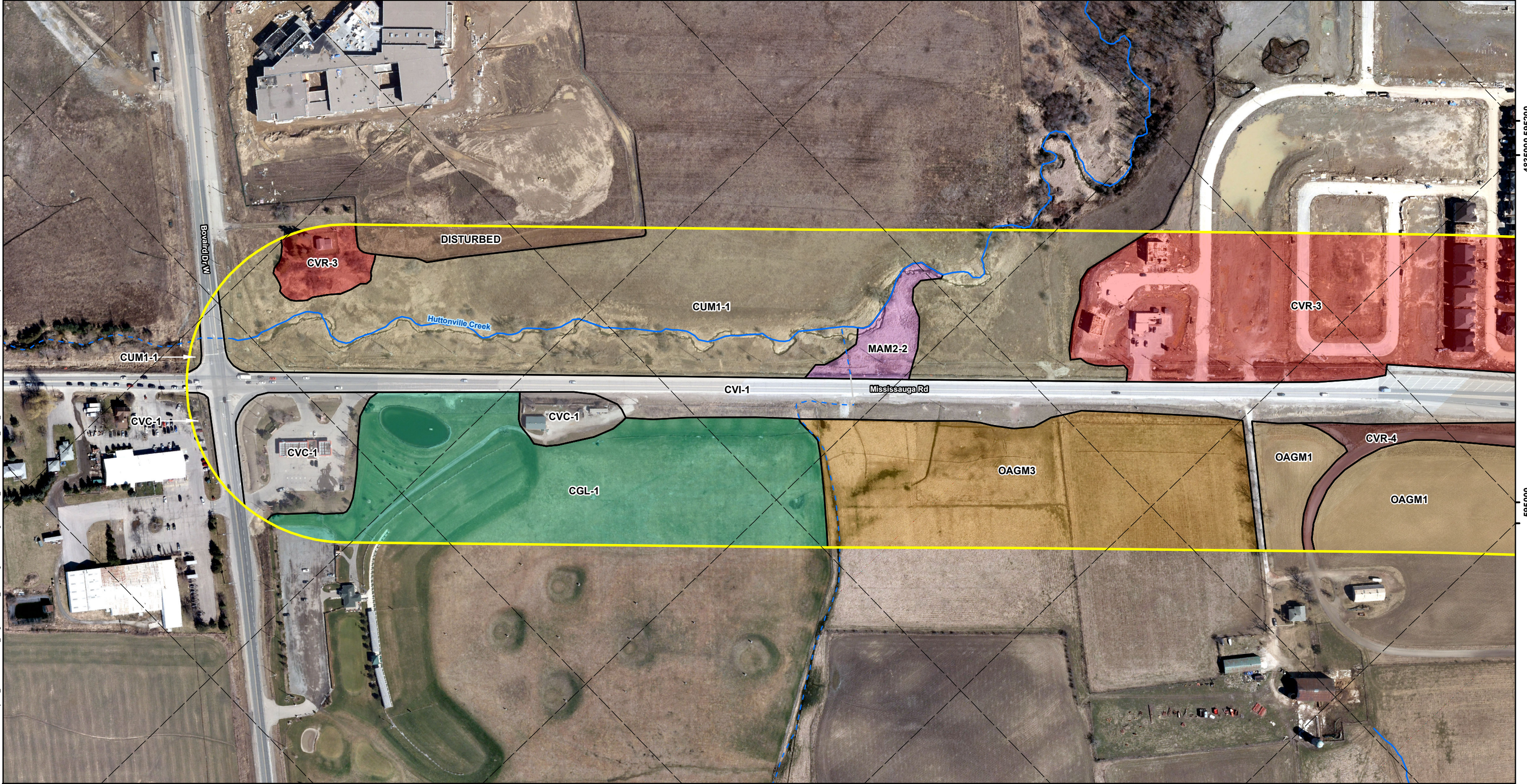
The project is located within the Peel Plain physiographic region which extends across the central portions of the Regions of Halton, Peel, and York. The soils within and adjacent to the study area are classified as Oneida clay loam, Fox sandy loam, Chinguacousy clay loam and Bottom Lands (LGL 2006).

5.2 Vegetation

A total of three wetland areas were documented during Amec Foster Wheeler surveys and are illustrated in Figure 3 (Map A-C). Two of the wetlands are located near the northeast and southwest ends of the study area and are both classified as Reed-canary Grass Mineral Meadow Marsh Type (MAM2-2). These wetlands are associated with Huttonville Creek and the tributary of the Credit River respectively and were dominated by Reed-canary Grass (*Phalaris arundinacea*), with an abundance of Common Reed (*Phragmites australis*) in the northern wetland. The third wetland is classified as Cattail Mineral Shallow Marsh Type and is associated with a Stormwater Management Pond recently constructed at the southeast end of the study area. This wetland was dominated by Cattail (*Typha latifolia*) with an abundance of willow and sedge species (presumably planted at the time of construction).

A total of 22 ELC community types / land uses were identified within the terrestrial study area, which includes previously unmapped cultural ecosites. Table 3 includes a summary of all the communities and their total area within the boundary of the study area. Vegetation community mapping was primarily consistent with that observed in 2006 with the exceptions included in Table 4.

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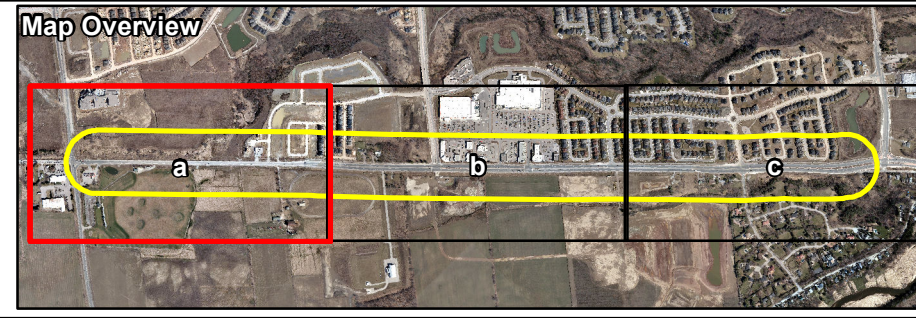
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- LEGEND**
- Study Area (120m Buffer)
 - Permanent Watercourse
 - Intermittent Watercourse
 - Culvert / Bridge

- Ecological Land Classification**
- CGL-1: Golf Course
 - CUM: Cultural Meadow
 - CUM1-1: Dry - Moist Old Field Meadow Type
 - CUT: Cultural Thicket
 - CUT1: Mineral Cultural Thicket Ecosite
 - CUW1: Cultural Woodland
 - CVC-1: Business Sector
 - CVC-2: Light Industry
 - CVC-3: Heavy Industry
 - CVI-1: Transportation and Utilities
 - CVR-2: Low Density Residential

- CVR-3: High Density Residential
- CVR-4: Rural Property
- Disturbed
- FOD2-2: Dry - Fresh Oak - Hickory Deciduous Forest Type
- FOD7: Fresh - Moist Lowland Deciduous Forest Ecosite
- FOD7-4: Fresh - Moist Black Walnut Lowland Deciduous Forest Type
- MAM2-2: Reed - canary Grass Mineral Meadow Marsh Type
- MAS2-1: Cattail Mineral Shallow Marsh Type
- OAGM1: Annual Row Crop
- OAGM3: Speciality Crop
- Water



NOTES:
 - Background imagery from City of Brampton, Spring 2016
 - Topographic features extracted from LIO, MNRF.

Datum & Projection:
 NAD 1983 UTM Zone 17N

MISSISSAUGA ROAD WIDENING PROJECT

Ecological Land Classification

PROJECT N^o: TP115085

FIGURE: 3a

SCALE: 1:2,750

DATE: December 2016



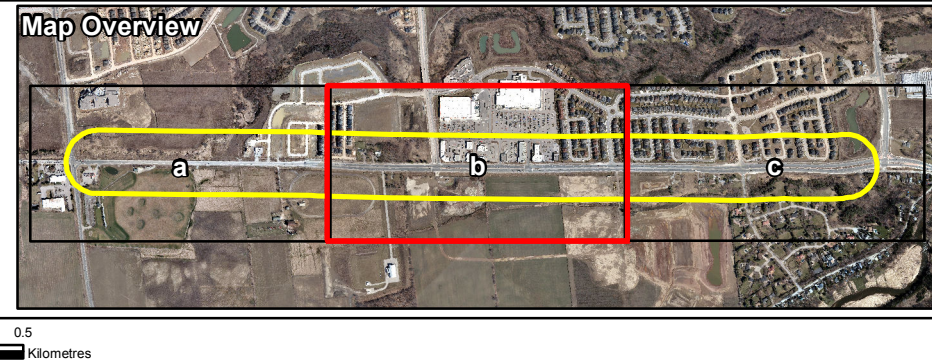


LEGEND

- Study Area (120m Buffer)
- Permanent Watercourse
- Intermittent Watercourse
- Culvert / Bridge

Ecological Land Classification

CGL-1: Golf Course	CVR-3: High Density Residential
CUM: Cultural Meadow	CVR-4: Rural Property
CUM1-1: Dry - Moist Old Field Meadow Type	Disturbed
CUT: Cultural Thicket	FOD2-2: Dry - Fresh Oak - Hickory Deciduous Forest Type
CUT1: Mineral Cultural Thicket Ecosite	FOD7: Fresh - Moist Lowland Deciduous Forest Ecosite
CUW1: Cultural Woodland	FOD7-4: Fresh - Moist Black Walnut Lowland Deciduous Forest Type
CVC-1: Business Sector	MAM2-2: Reed - canary Grass Mineral Meadow Marsh Type
CVC-2: Light Industry	MAS2-1: Cattail Mineral Shallow Marsh Type
CVC-3: Heavy Industry	OAGM1: Annual Row Crop
CVI-1: Transportation and Utilities	OAGM3: Speciality Crop
CVR-2: Low Density Residential	Water



NOTES:
 - Background imagery from City of Brampton, Spring 2016
 - Topographic features extracted from LIO, MNRF.

Datum & Projection:
 NAD 1983 UTM Zone 17N

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MISSISSAUGA ROAD WIDENING PROJECT

Ecological Land Classification

PROJECT N^o: TP115085 **FIGURE: 3b**

SCALE: 1:2,750 DATE: December 2016

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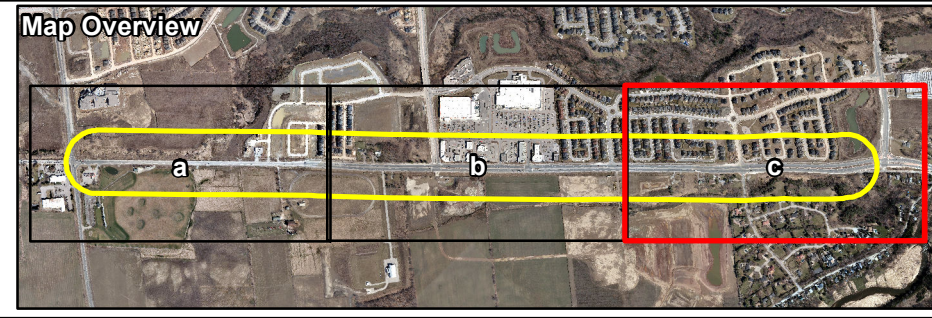
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- LEGEND**
- Study Area (120m Buffer)
 - Permanent Watercourse
 - Intermittent Watercourse
 - Culvert / Bridge

- Ecological Land Classification**
- | | |
|---|--|
| CGL-1: Golf Course | CVR-3: High Density Residential |
| CUM: Cultural Meadow | CVR-4: Rural Property |
| CUM1-1: Dry - Moist Old Field Meadow Type | Disturbed |
| CUT: Cultural Thicket | FOD2-2: Dry - Fresh Oak - Hickory Deciduous Forest Type |
| CUT1: Mineral Cultural Thicket Ecosite | FOD7: Fresh - Moist Lowland Deciduous Forest Ecosite |
| CUW1: Cultural Woodland | FOD7-4: Fresh - Moist Black Walnut Lowland Deciduous Forest Type |
| CVC-1: Business Sector | MAM2-2: Reed - canary Grass Mineral Meadow Marsh Type |
| CVC-2: Light Industry | MAS2-1: Cattail Mineral Shallow Marsh Type |
| CVC-3: Heavy Industry | OAGM1: Annual Row Crop |
| CVI-1: Transportation and Utilities | OAGM3: Speciality Crop |
| CVR-2: Low Density Residential | Water |



NOTES:
 - Background imagery from City of Brampton, Spring 2016
 - Topographic features extracted from LIO, MNRFP

Datum & Projection:
 NAD 1983 UTM Zone 17N

MISSISSAUGA ROAD WIDENING PROJECT

Ecological Land Classification

PROJECT N^o: TP115085 **FIGURE: 3c**

SCALE: 1:2,750 DATE: December 2016



Table 3: ELC Vegetation Communities and Land Uses

ELC Community / Land Use Code	ELC Community Description	Total Cover (ha)
CGL-1	Golf Course	3.6
CUM	Cultural Meadow	0.2
CUM1-1	Dry - Moist Old Field Meadow Type	7.9
CUT	Cultural Thicket	0.1
CUT1	Mineral Cultural Thicket Ecosite	0.5
CUW1	Cultural Woodlot	1.0
CVC-1	Business Sector	5.9
CVC-2	Light Industry	0.1
CVC-3	Heavy Industry	2.3
CVI-1	Transportation and Utilities	11.4
CVR-2	Low Density Residential	0.1
CVR-3	High Density Residential	19.1
CVR-4	Rural Property	0.9
FOD2-2	Dry - Fresh Oak - Hickory Deciduous Forest Type	0.3
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite	0.1
FOD7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest Type	1.8
MAM2-2	Reed-cannary Grass Mineral Meadow Marsh Type	0.9
MAS2-1	Cattail Mineral Shallow Marsh Type	0.3
OAGM1	Annual Row Crop	5.9
OAGM3	Speciality Crop	3.2
Disturbed	Under construction at time of visit	6.9
Water	Open Water	0.1
Total		72.4

Table 4: Changes in ELC Vegetation Communities since LGL 2005 Surveys

Figure No.	Location	LGL 2006 ELC Code	2016 Amec Foster Wheeler ELC Code	Reason for Change
3b	East of Mississauga Rd. north of Williams Pky.	None	CUT, CUM1-1	At the time of LGL field surveys this area represented two residential lots. Since that time the houses were removed, Williams Pky. was constructed, and natural succession has developed a small thicket area.
3b	West of Mississauga Rd. near the intersection of Williams Pky.	CUT1	Disturbed	Cultural thicket removed to accommodate new development.
3b	East of Mississauga Rd. between Williams Pky. and Beacon Hill Dr.	CUP3	CVC-1, CVR-3	Coniferous plantation removed to accommodate new development.
3c	East of Mississauga Rd. near Adamsville Rd.	CUM1-1	CVR-3	Cultural meadow removed to accommodate new development.
3c	East of Mississauga Rd. between Adamsville Rd. and Queen St. W.	CUT1	CVR-3	Cultural thicket removed to accommodate new development.

Figure No.	Location	LGL 2006 ELC Code	2016 Amec Foster Wheeler ELC Code	Reason for Change
3c	East of Mississauga Rd. north of Queen St. W. intersection	CUM1-1	CUT1, MAS2-1, CUM	Cultural meadow removed to accommodate construction of a stormwater management pond with associated wetland and cultural thicket areas.
3c	West of Mississauga Rd. north of Ostrander Blvd.	None	FOD7-4	Not formerly captured in the ELC survey. This small woodlot has developed into a Fresh-Moist Black Walnut Lowland Deciduous Forest Type presumably a remnant of that on the south side of Ostrander Blvd.
3c	West of Mississauga Rd. south of Ostrander Blvd.	CUW1, CUP3, CUT1, FOD7	FOD7-4, FOD2-2, FOD7	Thicket and woodland areas in this portion of the study area have developed through natural selection to have greater than 75% canopy cover from deciduous tree species.
3c	Immediately adjacent to Mississauga Rd., on the west side, south of Ostrander Blvd.	MAM2	CUM1-1	A narrow strip of land immediately adjacent to Mississauga Rd. in this area has been classified as cultural meadow as it is above the top of bank and is not comprised of wetland species like the neighbouring meadow marsh.

6.0 WILDLIFE AND WILDLIFE HABITAT

Previous field investigations within the study area were conducted in January and July 2005 to document wildlife and wildlife habitat and to characterize the nature, extent and significance of animal usage within the project limits (LGL 2006). Direct observations, calls, tracks, scats, runways, and odors were used to record the wildlife.

6.1 Wildlife

Previous field investigations reported 33 species of birds, 15 species of mammals, and 5 species of herpetofauna were identified in the study area either through field investigations or from secondary source information (LGL 2006).

6.2 Wildlife Habitat

The majority of the project study area is agricultural land use interspersed with a few rural residences. The two major natural heritage features in the study area are the riparian zone surrounding Huttonville Creek, Andrew McCandless Park, at the northeast end of the study area and the portion of the Churchville-Norval Wetland Complex associated with the tributary of the Credit River at the southwest end of the study area (Figure 2). Urban environmental settings, like roadside ditches, planted tree rows, a cemetery, and remnants of natural heritage features, occur around residences and in small pockets amongst the agricultural fields in the remainder of the study area (LGL 2006). The natural heritage features showed evidence of being the most

productive habitats in the area for wildlife. The majority of the wildlife occurring in the study area would be considered tolerant of human presence.

A concrete box culvert which conveys Huttonville Creek under Bovaird Drive West at the north end of the study area acts as the only migration corridor in the study area. This wildlife passage is continuous with the creek and riparian zone in the northeast quadrant of the study area, and functions as a movement corridor for many mammal species. Ongoing roadway improvements for Bovaird Drive West include the replacement of the existing box structure with a 14.6 m wide and 72 m long concrete culvert.

7.0 ENVIRONMENTAL EFFECTS ASSESSMENT AND MITIGATION MEASURES

The following subsections have been prepared to provide details on the direct and indirect effects of the Project on both the terrestrial and aquatic ecosystems, and to outline measures to mitigate negative environmental effects. The Project layout overlaid on the existing terrestrial and aquatic environment is illustrated on Figure 4.

7.1 Aquatic Ecosystem

7.2 Predicted Environmental Effects

The watercourse at crossing C1 represents cross drainage feature exhibiting minimal flow. The culvert has been replaced during recent works unrelated to this component of the project, and no additional work is required on the drainage feature. A small excavated pond located approximately 120 m south of the intersection of Mississauga Road and Bovaird Drive West will also be impacted by the works (492 m²); however, this waterbody does not represent fish habitat. As such, no direct effects on fish and/or fish habitat are predicted due to Project activities.

Activities related to the construction near culvert C1 have the potential to lead to a temporary increase in surface water turbidity, with an increased risk of siltation in adjacent aquatic environments. Furthermore, spills and leaks during construction could allow contaminated water to enter the watercourses present on site. The potential for such effects is low if appropriate mitigation and environmental protection planning measures are applied consistent with Ontario Provincial Standards (described in Section 4.2.1.2 below).

The limited temporary and/or permanent removal of shrubs and meadow vegetation will be required for the construction of the widened roadway. Ground disturbance and removal of herbaceous vegetation can result in temporary erosion and sedimentation and instability in Crossing C1 channel banks.

7.3 Mitigation Measures

Specific mitigation measures have been developed to minimize and/or avoid significant short-term and long-term adverse environmental effects on fish and fish habitat. Principal mitigation measures for construction activities in or near to a watercourse include:

- Prior to commencement of works, design and implement standard Erosion and Sediment Control (ESC) measures, consistent with Ontario Provincial Standards and Specifications (OPSS) and maintained ESC measures through all phases of the Project until vegetation

is re-established, all disturbed ground is permanently stabilized. The ESC measures should be installed and meet the following requirements:

- Installation of silt fencing consisting of geotextile and wooden stakes. Fencing is installed such that a minimum of 600 mm of geotextile is above ground and a minimum of 300 mm is buried;
- Dewatering stations shall be located a minimum of 30 m from the channel edge in a vegetated area;
- Note that more stringent measures, e.g., double-row non-woven, wire-backed silt fencing and the installation of staked straw bales between the silt fences, may be necessary adjacent to drainage feature C1 to prevent silt from entering downstream Redside Dace habitat;
- All ESC measures should be inspected at least weekly and during and immediately following rainfall events to ensure that they are functioning properly and are maintained and/or upgraded as required. If the sediment and erosion control measures are not functioning properly, no further work would occur until the sediment and/or erosion problem is addressed.
- The ESC silt fencing should be installed around the Project footprint, allowing vehicle and construction staff access to the Project footprint only at designated areas.
- Additional ESC measures relative to mitigating impacts of the aquatic ecosystem include:
 - Soil sediment and other impurities must be prevented from entering the watercourse located immediately downstream of the site.
 - Stockpiles and embankments are to be protected whenever there is potential for soil erosion to impact to the river.
- All materials and equipment used for the purpose of site preparation and Project construction should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the watercourses present on site:
 - Any stockpiled materials should be stored and stabilized at least 30 m away from the drainages.
 - Refuelling and maintenance of construction equipment should occur a minimum of 30 m from the drainage features draining into a watercourse.
 - Any part of equipment entering the water would be free of fluid leaks and externally cleaned / degreased to prevent any deleterious substance from entering the watercourse.

- Only clean material, free of fine particulate matter would be placed in the water.
- A protocol to minimize spills/leaks and their impact to the environment should be provided in the Emergency Response Plan. Routine inspection of the Project construction site should be conducted to ensure continued use and function of best management practices, mitigation measures and spill control and prevention measures. As appropriate, spills should be reported to the MOECC Spills Action Centre;
 - Scheduling work within drainage ditches to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- Materials such as sand bags, straw bales, geotextile filters, and/or pumps should be readily available on-site in case of unexpected stream flow during construction activities;
- Staging of the Project should limit vegetation disturbance and minimize the amount of time disturbed soil is exposed;
- Temporarily store, handle and dispose of all materials used or generated (e.g., organics, soils, construction waste and debris, etc.) during site preparation, construction, and clean-up in a manner that prevents their entry to the watercourse located downstream of the site;
- Concrete wash water must never be released into a watercourse, catch basin, ditch, or any other part of a land drainage system. Mitigation measures should include:
 - Wash-out facilities should be available on site, with waterproof lining to prevent soil and groundwater contamination. These wash-out facilities should be situated away from watercourses or drains;
 - Liquid and solid concrete waste is disposed of lawfully using licensed haulers and licensed receiving facilities; and
- Land drainage systems, whether naturally occurring or man-made are not to be used as receptors for any substance or material other than clean water complying with local municipal bylaws or storm water as intended.

Offset protection is already provided adjacent to Huttonville Creek in the reach that runs parallel to Mississauga Road and is ongoing construction in 2016/2017. A slope retention structure was constructed and will be incorporated into the design for this project (Appendix B). Significant impacts to aquatic habitat in the vicinity of Mississauga Road are not anticipated as a result of scheduled project works. There is potential for localized changes in hydrology and water quality due to the increase in impervious surfaces; however, mitigation measures and best management practices are expected to prevent these changes from impacting aquatic habitat.

7.3.1 Residual Environmental Effects

With proper planning, design, and implementation of the mitigation measures detailed above, the proposed works are not predicted to adversely impact the watercourses present on site. Project works are to be restricted to the defined Project footprint, thus minimizing the impact to Huttonville Creek, the ephemeral tributary of Huttonville Creek and the unnamed tributary of the Credit River.

7.3.2 Significance of Residual Environmental Effects

If mitigation measures prescribed above are implemented, the potential for significant adverse effects to the aquatic ecosystem due to Project activities is negligible.

7.4 Terrestrial Ecosystem

7.4.1 Vegetation Communities and Ecosites

7.4.1.1 Predicted Environmental Effects

Anticipated Project-related effects on vegetation communities include direct impacts of vegetation clearing, as well as indirect impacts such as dust production, the introduction of deleterious substances (e.g., salt, solvents, oil and grease, exhaust, and litter) resulting from Project vehicles and equipment, and soil erosion.

The vegetation communities and ecosites directly impacted due to the Project are provided in Table 2 below. Approximately 25,656.4 m² of cultural meadow habitat (CUM) and 2,279 m² of agricultural lands will be removed by the proposed works (Figure 4). Within this area, a small, unmappable inclusion exists adjacent to a barn at the south of the site. There are also several areas of manicured lawn with tree plantings located to the north of the study area. No wetland habitat is present within the footprint of the Project.

Table 2: Summary of Terrestrial Impact Areas

Vegetation Type	Area (m²)
Cultural Meadow (CUM)	25,656.4
Speciality Crop (OAGM3)	1,059
Annual Row Crop (OAGM1)	1,220

An increase in machine and equipment use will result in increased dust generation and deposition on vegetation. Dust can affect photosynthesis, respiration and transpiration in plants and allow the penetration of phytotoxic gaseous pollutants (Farmer, 1993). Overall, dust deposition on plants results in some visible injury symptoms and a general decrease in plant productivity. The structure of vegetation communities may also be affected. Additionally, there is a potential for contamination caused from construction equipment malfunction and accidental spills.

7.4.1.2 Mitigation Measures

Specific mitigation measures have been developed to minimize and/or avoid significant short-term and long-term adverse environmental effects to the local vegetation communities. Principal mitigation measures include:

- As per the mitigation measures recommended for the aquatic environment, standard Erosion and Sediment Control (ESC) measures (silt fencing) will be designed and implemented prior to the commencement of the construction activities. No equipment should be permitted to enter any natural areas beyond the silt fencing during construction to minimize the amount of vegetation removal and to limit the spread of invasive plant species;
- Minimizing dust production to the extent practical by implementing dust suppression methods and thereby minimizing the zone of influence. Primary dust suppression methods can include road watering in cases where watering will not promote entry of chemicals in to the river;
- Prevent introduction of new invasive species by washing down equipment prior to transporting to site and limiting travel of equipment and vehicles to and from the Project Study Area;
- Any hazardous substances stored within the laydown areas should be properly contained to prevent its release into the environment
- Ensure hazardous substances, if required, are stored, handled and applied in accordance with local regulations and in a manner which prevents release to the environment;
- Ensure a contingency plan is developed and implemented in the event of an accidental spill from construction vehicle, machinery or equipment; and
- Comply with the *Migratory Bird Convention Act, 1997* (MBCA) regulations and guidelines for vegetation clearing recommended by Environment Canada (see further MBCA details included in Wildlife and Significant Wildlife Habitat section below).

7.4.1.3 Residual Environmental Effects

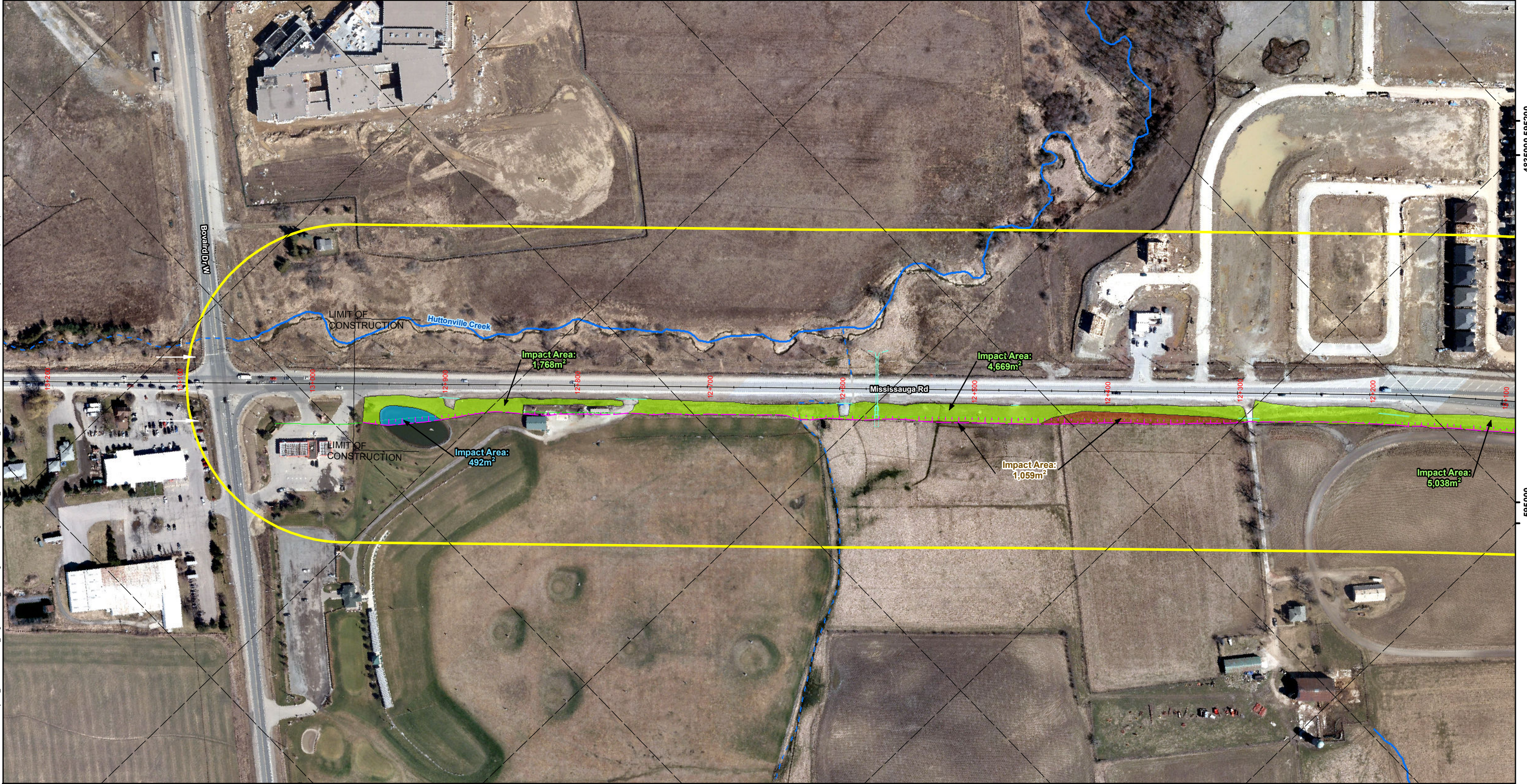
Project activities will result in the clearing of 25,656.4 m² of existing roadside (CUM) vegetation and approximately 2,279 m² of agricultural lands. Any trees to be removed should be clearly identified and trees that are to remain in close proximity to project works should be sheltered by tree protection fencing. Minor tree removals that may be required should be replaced at an agreed upon ratio approved by CVC. Site restoration will include the application of a native seed mix to revegetate areas disturbed by construction.

With the implementation of mitigation measures, including on-site habitat restoration, no significant adverse impacts to plants and vegetation communities are expected due to the Project.

7.4.1.4 Significance of Residual Environmental Effects

The magnitude of disturbance to local vegetation communities is considered to be minor. Construction activities will result in temporary effects as restoration as described above will ultimately result in the restoration vegetation communities to their pre-construction state within the boundaries of the Project Study Area.

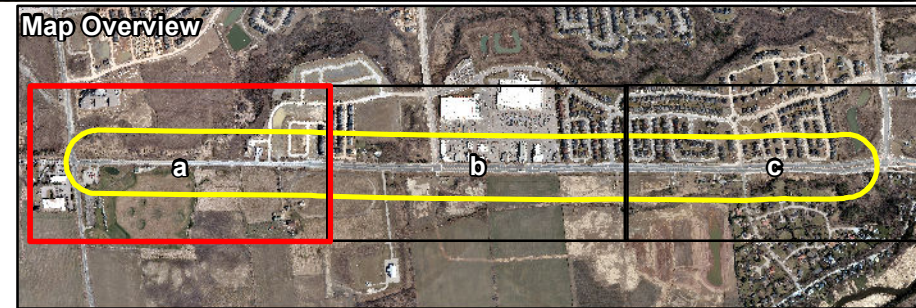
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- LEGEND**
- Study Area (120m Buffer)
 - Alignment
 - Culverts
 - Grading Limit
 - Permanent Watercourse
 - Intermittent Watercourse
 - Culvert / Bridge

- Impact Assessment**
- CUM: Cultural Meadow (25,656.4m² total area of impact)
 - OAGM3: Speciality Crop (1,059m² total area of impact)
 - OA: Open Water (492m² total area of impact)



NOTES:
 - Background imagery from City of Brampton, Spring 2016
 - Topographic features extracted from LIO, MNRF.

Datum & Projection:
 NAD 1983 UTM Zone 17N

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MISSISSAUGA ROAD WIDENING PROJECT

Impact Assessment

PROJECT N^o: TP115085 **FIGURE: 4a**

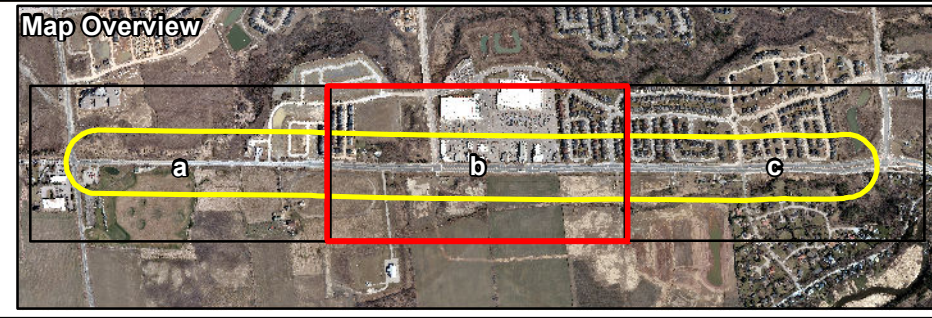
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- LEGEND**
- Study Area (120m Buffer)
 - Alignment
 - Culverts
 - Grading Limit
 - Permanent Watercourse
 - Intermittent Watercourse
 - Culvert / Bridge

- Impact Assessment**
- CUM: Cultural Meadow (25,656.4m² total area of impact)
 - OAGM1: Annual Row Crop (1,220m² total area of impact)



NOTES:
 - Background imagery from City of Brampton, Spring 2016
 - Topographic features extracted from LIO, MNRF.

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MISSISSAUGA ROAD WIDENING PROJECT

Impact Assessment

Datum & Projection:
NAD 1983 UTM Zone 17N

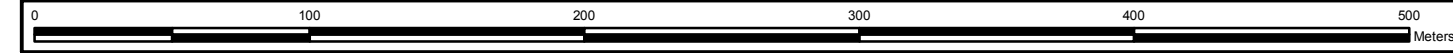


PROJECT N^o: TP115085

FIGURE: 4b

SCALE: 1:2,750

DATE: April 2017



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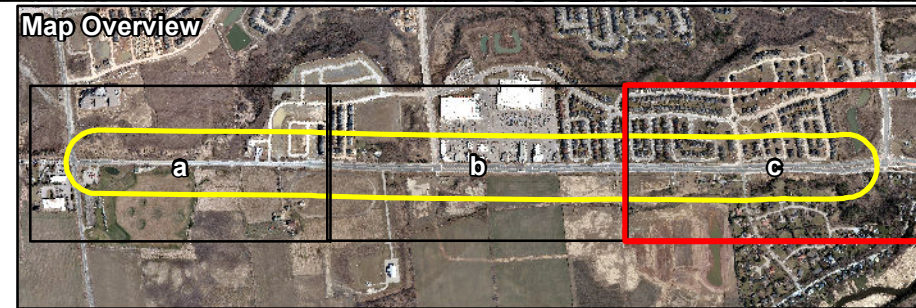


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- LEGEND**
- Study Area (120m Buffer)
 - Alignment
 - Culverts
 - Grading Limit
 - Permanent Watercourse
 - Intermittent Watercourse
 - Culvert / Bridge

Impact Assessment

CUM: Cultural Meadow (25,656.4m² total area of impact)



NOTES:

- Background imagery from City of Brampton, Spring 2016
- Topographic features extracted from LIO, MNRF.

Region of Peel
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MISSISSAUGA ROAD WIDENING PROJECT

Impact Assessment



Datum & Projection:
NAD 1983 UTM Zone 17N



PROJECT N^o: TP115085

FIGURE: 4c

SCALE: 1:2,750

DATE: April 2017

7.4.2 Wildlife and Significant Wildlife Habitat

7.4.2.1 Predicted Environmental Effects

Roadways and vehicles impact wildlife in a wide variety of ways by means of habitat loss, fragmentation, vehicle collisions, and habitat degradation (Ontario Roadway Ecology Group, 2010). The widening of Mississauga Road and replacement of the bridge will result in the removal of vegetation and the expansion of driving surface and may have the potential to negatively impact terrestrial wildlife and their habitat by various means, both directly and indirectly, through vegetation removal, dust production, removal of habitat cover such as rocks or woody debris, and the introduction of deleterious substances (e.g., salt, paint, solvents, oil and grease, litter) into the surrounding environment.

During construction of the widened roadway, harm or disturbance to local wildlife species may be caused by disturbance to bird nests, dust production, removal of habitat cover such as vegetation or woody debris, and the introduction of toxic substances (e.g., salt, paint, solvents, oil and grease, litter) into the surrounding environment may occur as result of the Project. In addition, Project-related vehicle-wildlife collisions have the potential to occur.

7.4.2.2 Mitigation Measures

Specific mitigation measures have been developed to minimize and/or avoid significant short-term and long-term adverse environmental effects on wildlife and wildlife habitat. Principal mitigation measures include:

- Comply with the *Migratory Bird Convention Act, 1997* (MBCA) regulations and guidelines for vegetation clearing recommended by Environment Canada. In order to minimize the potential for incidental take of nesting migratory birds, vegetation clearing and any proposed work activities in migratory bird habitat should be undertaken outside of the active breeding season. Clearing is to be avoided from April 1 to August 30 for this Project location, although these timing constraints should not be perceived as absolutes. This period represents the core breeding period, although some species may nest in March and September. Ultimately, the objective from a compliance perspective is to not circumvent the MBCA. As such, due diligence measures should be implemented and documented for any nest searching efforts, including record control, to ensure compliance with the MBCA;
- Inclusion of wildlife awareness information into regular safety and environmental meetings (i.e., bird nesting and frog/turtle movement in the spring, bird egg hatching in the summer);
- Encourage workers to report wildlife sightings to promote awareness of possible wildlife crossing zones along travel routes;
- Disposing of food wastes generated on site in a manner that limit the attraction of wildlife, such as Coyote (*Canis latrans*), Red Fox (*Vulpes vulpes*), or Raccoon (*Procyon lotor*);

- Development of a compact zone of impact to reduce overall habitat loss and to limit the potential harm to small species susceptible to crushing such as young birds, reptiles, and amphibians;
- Where feasible, works will be conducted during daylight hours, unless otherwise necessary, to avoid potential effects of artificial night lighting on crepuscular and nocturnal species;
- Minimize sources of unnecessary noise or encroachment of worker activities into nearby habitats in order to limit the extent of the Project zone of influence when possible;
- All heavy equipment and tools used on-site shall be maintained in good working condition;
- Construction personnel shall avoid idling of vehicles when not necessary for construction activities;
- Equipment and vehicles shall be turned off when not in use unless required for construction activities and/or effective operation;
- In the event wildlife is encountered during Project activities, specialists may be needed for relocation of a particular species on site. Procedures for removal include:
 - Wildlife must not to be tormented, injured in any way, destroyed, separated from young, or relocated beyond their home territory;
 - Wildlife service providers are to be licensed, insured, and/or have a thorough working knowledge of animal habits, habitat, and behaviors;
 - Wildlife service providers are expected to enter into written contracts, and such contracts are to be kept on file;
 - Credentials and references of wildlife service providers are to be checked. Where municipalities have prequalified wildlife service providers, only such prequalified service providers are to be used;
 - Indiscriminate trapping may result in orphaned young (resulting in death and decay) or spread of disease. This practice is, therefore, unacceptable on the Project Study Area;
 - Preference is to be given to service providers that utilize passive removal methods such as exclusion by "one way door" type systems;
 - Live captured animals must be released in close proximity to where they are caught; and

- Service providers must be capable of humanely reuniting mother with young and making sure all of the young have been re-claimed by parent animals.

Mitigation measures may be used to discourage birds from nesting in areas and on structures which are to be impacted by the project works. Furthermore, bird nesting exclusion measures can be applied to areas known to have bird nesting activities. However, measures for exclusion must be applied prior to the active nesting period starting April 1 of any given year. Exclusion measures can include netting, rubber matting and/or noise deterrent devices. If avian SAR are reporting utilizing the area, exclusion measures cannot be applied until correspondence with the MNRF has been completed and necessary mitigation or permitting measures have been applied.

In the event that bird nests protected under the MBCA, FWCA, or ESA are encountered during construction, work must stop in the vicinity of the sighting until further direction is provided. These species and their nests must not be disturbed, tormented, injured in any way, destroyed, and/or separated from young. A protective buffer area should be established around the nest and should be determined in consultation with a qualified avian biologist, as well as the MNRF and/or CWS, as necessary.

7.4.2.3 Residual Environmental Effects

Despite the removal of 27, 934.4 m² of vegetation within the Project footprint, the implementation of mitigation measures should alleviate adverse negative effects on wildlife due to Project activities. Project works are to be restricted to the defined Project footprint, thus minimizing the impact to wildlife and their habitat within the Project Study Area. SAR, provincially rare species, and all other wildlife are anticipated to experience negligible increased risk of harm or mortality under the implementation of the mitigation measures recommended.

7.4.2.4 Significance of Residual Environmental Effects

The magnitude of disturbance to wildlife and their habitat is considered to be minor and/or solely confined to the Project footprint. The effects to impacted vegetation communities will last continuously beyond the work schedule in terms of the time required to restore any cleared or damaged vegetation; however, this regeneration is not expected to have appreciable negative direct or indirect effects to wildlife.

8.0 SUMMARY AND CONCLUSIONS

The site conditions reported during the 2016 field investigation indicated considerable changes to the terrestrial environment since those observed in 2005 (LGL 2006).

The majority of the area to be impacted by project works is comprised of previously disturbed areas. The primary concerns for natural ecosystem protection are associated with wetlands and woodlands adjacent to the work corridor. Disturbance to wetlands can be minimized by utilizing temporary matting to disperse weight loads of equipment, and to prevent disturbance as a result of equipment tracks and tires. In woodland areas, and locations with individual trees that do not require removal, tree exclusion zones can be installed for the protection of trees adjacent to the work activity.

The protection of Redside Dace and their protected habitat located immediately downstream of Crossing C1 and other cross drainage culverts located along Mississauga Road within the within the section of works located adjacent to Huttonville Creek is also a primary concern for this project. Aquatic habitat within the west limits of the project area have remained essentially unchanged with the exception of the replacement of the culvert at Crossing C1.

9.0 REFERENCES

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- Ministry of Natural Resources and Forestry (MNRF). 2015. Biodiversity Explorer: Natural Heritage Information Centre (NHIC) database. Accessed from: <https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/mainSubmit.do>.
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APPENDIX A
MNRF CORRESPONDANCE

Oct 9, 2015

Brittany Ferguson
Amec Foster Wheeler
160 Traders Blvd, Suite 110
Mississauga, ON L4Z 3K7
(905) 568 2929 x 4122
brittany.ferguson@amecfw.com

Re: Request for Information for Mississauga Road Widening (Location 1: Queen Street to Financial Drive & Location 2: Bovaird Drive to Queen Street)

Dear Miss. Ferguson,

In your email dated Oct 5, 2015 you requested information on natural heritage features and element occurrences occurring on or adjacent to the above mentioned location. There are Species at Risk recorded for your study area. As of the date of this letter, we have records of:

Redside Dace	END
Butternut	END
American Chestnut	END
Eastern Meadowlark	THR
Bobolink	THR
Chimney Swift	THR
Barn Swallow	THR
Northern Map Turtle	SC
Snapping Turtle	SC
Eastern Milksnake	SC

Additionally, the species listed below have the potential to occur in your study and may require further assessment or field studies to determine presence. We have records of the following species within the vicinity of your study area:

Eastern Small-footed Myotis	END
Little Brown Myotis	END
Northern Myotis	END
Bank Swallow	THR
Peregrine Falcon	SC
Monarch	SC

Natural heritage features recorded within your area include the:

- Occupied Redside Dace (END) habitat: Huttonville Creek
- Provincially Significant Churchville-Norval Wetland Complex
- Locally Significant Springbrook Wetland Complex
- Huttonville Creek & Area Wetland Complex
- Regionally Significant Georgetown Credit Valley ANSI

These species may receive protection under the *Endangered Species Act 2007* and thus, an approval from MNRF may be required if the work you are proposing could cause harm to these species or their habitats. If the Species at Risk in Ontario List is amended, additional species may be listed and protected under the *ESA 2007* or the status and protection levels of currently listed species may change.

Absence of information provided by MNRF for a given geographic area, or lack of current information for a given area or element, does not categorically mean the absence of sensitive species or features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. For these reasons, the MNRF cannot provide a definitive statement on the presence, absence or condition of biological elements in any part of Ontario.

This species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to our office. This will assist with updating our database and facilitate early consultation regarding your project.

If you have any questions or comments, please do not hesitate to contact ESA.aurora@ontario.ca.

Sincerely,



Catherine Wisniowski
Wildlife Technician
Ontario Ministry of Natural Resources and Forestry, Aurora District



APPENDIX B
MEETING MINUTES

Minutes of Meeting

Date: February 19, 2016
File #: TP115085-75
Meeting Date & Time: January 21, 2016
Meeting at: Region of Peel, Conference Room
Subject: Mississauga Road Class Environmental Assessment
 Kick-Off Meeting – Workshop Summary

Attendees:

Antonietta Minichillo, City of Brampton	Jim Washburn, Region of Peel
Daniel Waters, City of Brampton	Liz Brock, Region of Peel
Craig Sherwood, Brampton Transit	Lorenzo Mele, Region of Peel
Chris Lafleur, Brampton Transit	Anthony Zois, Region of Peel
Rebecca Stewart, CVC	Lori-Ann Thomsen, Region of Peel
Jakub Kilis, CVC	Nathan Sinka, Region of Peel
Liam Marray, CVC	Bob Nieuwenhuysen, Region of Peel
Steve Ganesh, Region of Peel	Boguslaw Lipka, Region of Peel
Gary Kocialek, Region of Peel	Sally Rook, Region of Peel
John Kolb, Region of Peel	Sargon Sifo, Region of Peel
Kathryn Dewar, Region of Peel	Gene Chartier, Paradigm
Natalie Lapos, Region of Peel	David Sinke, Amec Foster Wheeler
Arthur Lo, Region of Peel	Jason Stahl, Amec Foster Wheeler
Kim McAdam, Region of Peel	Steve Chipps, Amec Foster Wheeler
Seema Ansari, Region of Peel	Mary Kelly, Amec Foster Wheeler
Sarah Powell, Region of Peel	Heather Dearlove, Amec Foster Wheeler
Jibril Farah, Region of Peel	

MATTERS DISCUSSED

ACTION BY:

Location 1:

Natural Environment:

1. Credit River Trail
 - The CVC, City of Mississauga, City of Brampton, Town of Caledon, and Town of Orangeville is undertaking this initiative
 - Initial plans are to follow the Credit River as close as possible which will require a crossing of Mississauga Road (above or below structure – prefer no crosswalks)

PLEASE NOTE: If there is any comment or amendment to be made to these meeting notes, they should be brought to the notice of Amec Foster Wheeler within 24 hours of issue and confirmed in writing

Continued...

Meeting Date: January 21, 2016

MATTERS DISCUSSED

ACTION BY:

- Currently in the initial design stages and preliminary discussion with property owners
- 2. Maple Trees
 - Located on the east side of Mississauga Road at the top of the Credit Valley slope
 - Identified in the 2002 Class EA and subsequent addendum
 - Particularly important to the Huttonville Community
- 3. Huttonville Valley Environmental Sensitive Area (ESA)
 - Limited potential for development within the ESA
- 4. Provincially Significant Wetland (PSW) and ANSI located adjacent to the Lionhead Golf and Country Club
 - No development is permitted within PSW
- 5. Credit River
 - Large floodplain
 - Mississauga Road is overtopped during regional storm event (+/- 2m water depth)
 - A fluvial geomorphic investigation will be required to determine potential sensitive areas and restrictions
- 6. Shale Reserve
 - In place until December 31, 2016
- 7. Low Impact Development (LID)
 - Currently limited to median planters and other landscaping features
 - CVC is keen on promoting initiative, however does not require LID be implemented
- 8. Groundwater
 - Issues were identified south of Embleton Road

Amec FW

Heritage/Archaeology:

- 9. Heritage Heights Planning Study
 - This study included an assessment of all heritage elements in the immediate vicinity of the Heritage Heights planning area
 - A review of the planning study document as it relates to the heritage resources should be completed by the Class EA team
- 10. River Road
 - Identified as a Cultural Heritage Landscape
- 11. Embleton Road
 - Many properties are listed as heritage resources
- 12. McMurchy Woolen Mills and Powerhouse

AmecFW

Continued...

Meeting Date: January 21, 2016

MATTERS DISCUSSED

ACTION BY:

- Property and outbuildings are designated as a significant heritage property

13. Credit River

- All areas around the Credit River have high archaeological potential

14. Other Heritage properties within the study area

- Visit the City of Brampton website for more information

AmecFW

Development:

15. Draft plans of subdivision

- A development located across from the Lionhead Golf and Country Club entrance is currently under review – approximately 100 single units/61 townhouse units

Amec FW

16. Lionhead Golf Course is reviewing options for residential development on property

17. Block 40-3 is under review

18. Is there capacity in the existing and/or proposed storm ponds for water from Regional Roads?

**Amec FW /
Region**

Existing Road Issues:

19. 1400mm x 875mm CSP Arch

- 675m south of Credit River
- Should be reviewed for potential impacts

AmecFW

20. Transit currently limited along corridor and there are no future plans to expand

21. Zum is being planned along Queen Street and Bovaird Drive for 2016

22. River Road

- The southbound right-turn lane on Mississauga Road appears to continue through the intersection but ends in a bus lane, which has confused road users
- The rumble strips located on River Road is an issue for road maintenance and numerous complaints by residents about the noise of the strips

Amec FW

23. Issue with the manholes covers lifting on the hill approaching the Credit River crossing

Region

24. Planter boxes in the median

- Requires lane closures to maintain
- Limited vegetation grows in the existing planter boxes

Continued...

Meeting Date: January 21, 2016

MATTERS DISCUSSED

ACTION BY:

- Various LID techniques have been investigated at this location but nothing has been approved

25. The multi-use trail system is discontinuous along the corridor

Study Considerations:

26. Confirm recommendations made by the Road Characterization Study for the study area

**Amec FW /
Paradigm**

27. Consider reduced lane widths and reduced median widths

**Amec FW /
Paradigm**

28. Avoid trees on west side

29. A large mall will be located on Mississauga Road north of Bovaird Drive, which could impact traffic volumes

**Amec FW /
Paradigm**

30. Consider a minimum 2m setback from curb to multi-use trail/sidewalks

Amec FW

31. Will the entrance to the 'Terrace on the Green' require reconfiguration?

Amec FW

32. Harmonize speed limits through study corridor

- Will the speed limit remain in this section of Mississauga Road? What is the appropriate speed limit for the area?

**Amec FW /
Paradigm /
Region**

33. Credit River Structure

- Is 6 lanes required over the structure?
- Only AM and PM peak congested?
- Can another corridor be improved to alleviate traffic on Mississauga Road?

**Amec FW /
Paradigm**

34. Mississauga Road is a truck route

- Used to service the Caledon area
- Are there other arterial roads that can be used to reduce truck traffic?
- Can time restrictions be implemented to reduce truck traffic?

**Amec FW /
Region**

35. Need to investigate methods to increase the use of ZUM transit

Region

36. Active Transportation Master Plan

- Adopted by Council for alternative and healthy living
- Opportunity to support Active Transportation components of Master Plan

37. Opportunity to advance Gateways to Brampton Initiative at Queen Street.

Amec FW

MATTERS DISCUSSED

ACTION BY:

38. Utility servicing

- Is there an opportunity to implement a utility corridor – a dedicated area in the boulevard in which utilities could be located (2-3 m strip)?
- Rogers will need to grow network to support development along corridor
- Currently using aerial through the use of hydro poles but is becoming increasingly more difficult
- The Mississauga Road corridor may become a fiber optic spine

Amec FW

39. Emphasize the importance of reducing vehicular traffic through other means

Region

40. Concerned with residential access to individual properties if road is widened

41. The properties on Embleton Road are on septic. Is there an opportunity to construct a sanitary sewer?

**Amec FW /
Region**

42. Embleton Road will be transferred to the City of Brampton

43. Region of Peel owns three properties along Mississauga Road, south of Embleton Road

44. Consideration for Navigable Water Act restrictions

45. Active transportation facilities

- Separate structure for pedestrians?
- Consider something similar to the pedestrian structure in downtown Bolton over the Humber River

**AmecFW /
Paradigm**

46. Confirm SWM criteria

- Expected to achieve quality/quantity control, erosion control, 80% TSS and flood control.

47. Heritage Road widening may relieve some traffic congestion on Mississauga Road

48. B. Nieuwenhuysen requested further analysis of the operational implications of retaining the existing four-lane bridge crossing over the Credit River if the adjoining sections of Mississauga Road were widened to six lanes. Paradigm to complete a traffic microsimulation analysis from Queen Street to Embleton Road for the future scenarios.

**AmecFW /
Paradigm**

MATTERS DISCUSSED

ACTION BY:

Location 2:

Natural Environment:

1. Redside Dace have been found within the Huttonville Creek Tributary
2. Huttonville Creek is located on the east side, and parallels Mississauga Road for approximately 500m

Heritage/Archaeology:

3. Pioneer Cemetery located on the east side of Mississauga Road is a designated property
4. Heritage property located at Bovaird Drive and Williams Parkway
5. See full list of heritage properties on the City of Brampton website

Amec FW

Development:

6. House at 9330 Mississauga Road to be demolished
7. Site plan applications for Four X Development

**Amec
FW/Region**

Existing Road issues:

8. Incorporate LID north of Queen Street
9. LID pilot projects located along corridor and should be incorporated into 6-lane widening
10. Planter boxes in the median
 - o Requires lane closures to maintain
 - o Limited vegetation grows in this location and the planter boxes are hard to maintain
11. High school located on Bovaird Drive may require a midblock crossing of Mississauga Road
12. Extensive retaining wall on east side of Mississauga Road, south of Bovaird Drive to be maintained
13. There is a man-made pond south of Bovaird Drive on the west side.

Amec FW

**Amec FW /
Region**

Study Considerations:

14. Existing pond on the east side of Mississauga Road just north of Queen Street may not have sufficient capacity to accept drainage from the road
15. Consider a minimum 2m setback from curb to multi-use trail/sidewalks

Amec FW

Amec FW

Continued...

Meeting Date: January 21, 2016

MATTERS DISCUSSED

ACTION BY:

- | | |
|--|--|
| 16. How do you transfer traffic numbers and widening to a cost/benefit analysis? How is widening determined to be the most cost effective method for improving traffic? | Amec FW /
Paradigm /
Region |
| 17. Is there an opportunity to create a consistent urban cross section? For the upcoming 4-lane widening, the west side will remain rural and east side will be an urban cross section | Amec FW /
Paradigm /
Region |
| 18. LID initiatives are being planned for east side of Mississauga Road from Williams Parkway to Bovaird Drive. Is there an opportunity to maintain and enhance feature? | Amec FW /
Region |
| 19. Is there an opportunity for enhanced streetscaping initiatives along west side of Mississauga Road? | Amec FW /
Region |
| 20. Encroachment agreement adjacent to Petro Canada (SW corner of Mississauga Road and Bovaird Drive) may be required | Amec FW |

List of Top Opportunities and Constraints:

Location 1:

1. Credit River Structure
 - o Cantilever design that would allow a separate pedestrian structure
 - o Is it possible to maintain 4 lanes on bridge while maintaining functionality of the roadway?
2. Provincially Significant Wetland (PSW)
3. Maintenance issues
 - o Manholes, median planter boxes
4. Numerous heritage designated properties along corridor
5. Existing utilities
6. Future Credit River Trail
7. Grading constraints (particularly near Credit River)
8. Gateway to the City of Brampton features
9. Maintenance of access to private properties
10. Public fatigue – numerous on-going projects in the corridor and within the surrounding area
11. Improve connectivity to surrounding trails

MATTERS DISCUSSED

ACTION BY:

Location 2:

1. Queen Street – maintain current lane configuration for north leg of intersection
2. Stormwater Management
 - Utilize SWM pond on NE corner of Mississauga Road and Queen Street?
3. Pioneer Cemetery
4. Development along west side of Mississauga Road
5. Huttonville Creek
 - Redside Dace habitat and potential stormwater management constraints
6. Future mall north of Bovaird Drive on the west side of Mississauga Road
7. Existing utilities
8. Potential to harmonize speed limits along corridor
9. Maintain and enhance LID features and opportunities
10. Improvement to streetscaping
11. Heritage structures

Meeting Minutes prepared by,

Amec Foster Wheeler Environment & Infrastructure
A Division of Amec Foster Wheeler Americas Limited



Per: Heather Dearlove, B.Sc.
Environmental Planner

HD/kf

Minutes of Meeting

Date: December 1, 2016
File #: TP115085
Meeting Date & Time: November 8, 2016
Meeting at: Region of Peel, Conference Room
Subject: Mississauga Road Class Environmental Assessment
Technical Agency Committee Meeting No.1

Attendees:

Neal Smith, Region of Peel
Asha Saddi, Region of Peel
Chris Lafleur, Brampton Transit
Kaitlyn McGlade, CVC
Rebecca Stewart, CVC
Jakub Kilis, CVC
Mark Heaton, MNR
Natalie Lapos, Region of Peel
Seema Ansari, Region of Peel
Jabril Farah, Region of Peel
Kathlyn Dewar, Region of Peel
Inderjit Hans, City of Brampton

Anthony Zois, Region of Peel
Nathan Sinka, Region of Peel
Bob Nieuwenhuysen, Region of Peel
Sally Rook, Region of Peel
Sargon Sifo, Region of Peel
Gene Chartier, Paradigm
David Sinke, Amec Foster Wheeler
Jason Stahl, Amec Foster Wheeler
Steve Chipps, Amec Foster Wheeler
Daryl Rideout, Amec Foster Wheeler
Heather Dearlove, Amec Foster Wheeler

MATTERS DISCUSSED

ACTION BY:

Note: Copy of the presentation and preliminary design for location 2 has been attached for your reference.

The following is a summary of the comments and questions asked during the presentation:

1. How was future traffic calculated? The future traffic numbers included the following:
 - o Data was compiled from the Region's transportation model and the City of Brampton's TTMP;
 - o Does not include the GTA West numbers;
 - o Factored in the expansion of the BramWest Parkway, and
 - o Anticipated improvements to parallel roads.
2. Does Brampton have any intention on expanding ZUM transit services along the Mississauga Road corridor? Currently, ZUM Transit services

PLEASE NOTE: If there is any comment or amendment to be made to these meeting notes, they should be brought to the notice of Amec Foster Wheeler within 24 hours of issue and confirmed in writing

Continued...

Meeting Date: November 8, 2016

MATTERS DISCUSSED

ACTION BY:

extend from Bovaird Drive to Queen Street. Mississauga Road from Queen Street to Financial Drive will be a support corridor and it is not anticipated to have ZUM services.

3. CVC noted that in Location 2 (addendum section) offset protection is already provided adjacent to the creek that runs parallel to Mississauga Road. A slope retention structure was constructed recently and it was understood that there would be no further work on the embankment. The developer has provided offset protection and will be incorporated into the design for the widening of Location 2.
4. MNRF requested clarification if there would be changes to the storm sewer discharge to the Credit River that is located south of the Credit River structure. Changes may be required in order to service the potential widening of Mississauga Road. However, the exact scope of changes (if any) cannot be confirmed until the specifics of the preferred design alternative is confirmed.
5. MNRF requested that there be consideration to allow for access to the Credit River north of the Credit River structure to facilitate fish restocking. Amec FW will review the potential for an access as part of subsequent phases of the Class EA process.
6. The MNRF requested that an access to the Credit River be considered to allow boat launching with parking similar to what is provided in Norval at Bovaird Drive/Heritage Road. Amec FW will review potential for this as part of subsequent phases of the Class EA process.
7. The Region noted that there may be additional archaeological assessments completed for the Four X Development lands and those findings should be incorporated into the assessment for Location 2. This area is currently being developed and under construction. Amec FW to review further and confirm if additional archaeological assessments are required adjacent to the Four X Development area.
8. The Region commented that additional geotechnical investigation may be required adjacent to the Credit River structure to confirm the ability of the footings / soil to support additional loading on the structure. Amec FW agreed with the need for additional boreholes and will explore the possibility as part of the geotechnical study to be completed later in the Class EA process.
9. The potential for a new structure at the Credit River Crossing was discussed including the option for a separate pedestrian crossing. If full replacement is pursued, the wider structure could accommodate the trail being proposed by CVC. CVC commented that the location of the trail is still conceptual and should not be factored into the assessment of

Continued...

Meeting Date: November 8, 2016

MATTERS DISCUSSED

ACTION BY:

alternatives. All options for the structure are being investigated and the assessment will take into consideration all of the identified constraints at the crossing.

10. Copies the planning alternative assessment table with written explanation was requested by several attendees. Amec Foster Wheeler to review and provide with the meeting minutes.
11. It was noted the stormwater management assessment should confirm if the stormwater management ponds is sufficient to accommodate the runoff from the proposed widening. Also, the assessment should consider implementation of LID BMP's as much as possible.

The following is a summary of the comments from the Group Discussion:

12. Some operational concerns were identified at the intersection of Mississauga Road and Queen Street West, as follows:
 - o Signage for the southbound curb lane needs to be reviewed. It is not clear that the curb lane transitions to a right turn lane as vehicles approach the intersection
 - o The sight lines for the northbound left turn lane at the intersection of Mississauga Road with Queen Street West should be reviewed.
13. The MNR identified the sand lens north of Williams Parkway, which would be ideal for implementation of LID BMP's. In addition, the section of Mississauga Road currently under construction is installing LID infrastructure along the east side of the roadway.
14. A number of locations for potential parking areas to service a potential canoe/kayak launching point were identified, as follows:
 - o South side of River Road, west of Mississauga Road
 - o Property owned by the Region on the west side of Mississauga Road, south of Embleton Road
 - o Southeast corner of Mississauga Road and Queen Street (former right turn speed change lane)
15. Permeable pavers was suggested for the multi-use trails, which would help achieve infiltration targets. The exact infiltration targets (2mm or 5mm) will be confirmed later in the study.

Meeting Minutes prepared by,

Amec Foster Wheeler Environment & Infrastructure
A Division of Amec Foster Wheeler Americas Limited

Continued...
Meeting Date: November 8, 2016

Per: Heather Dearlove, B.Sc.
Environmental Planner

HD/kf