Toronto and Region Conservation Authority

Mid Humber Gap (Phase 2) Feasibility Study

RO# 10007881

July 30, 2019

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Executive Summary

On July 18, 2018, the Mid Humber Gap (Phase 2) Feasibility Study (Phase 2A) Offer of Service (OOS) was authorized by the City of Toronto. TRCA has since internally developed four preliminary trail alignment concepts that were initially suggested by the City of Toronto and have been refined throughout this study.

The purpose of the Mid-Humber Gap Feasibility Study is to offer a high-level assessment of trail alignment concepts. Given private property constraints, the Feasibility Study approach is to review available baseline data in conjunction TRCA's Living City Policies and the City of Toronto's Multi-Use Trail Guidelines to inform the preliminary development of each concept. Objectives of this Feasibility Study include the identification of major information gaps, preparation of high-level cost estimates, and ultimately the recommendation of feasible trail alignment concepts for further exploration under the Municipal Class Environmental Assessment (MCEA) process. It is expected that this project will classify as a Schedule C MCEA project since the construction of new facilities is proposed.

Feasibility Study Background

The Mid Humber Gap is a barrier in the Humber River trail system, which extends 29-kilometres from the Claireville Dam to Lake Ontario. This gap is also a discontinuity in the 80-kilometre Pan Am Path which connects Brampton to Pickering (**Figure 1**).

Figure 1 Pan Am Path Route Map, City of Toronto

The Mid-Humber Gap was first identified in Toronto City Council's 2012 Bikeway Trails Plan as one of 26 projects for future implementation. In 2013, TRCA and the City of Toronto completed Phase 1 of this project, which extended the Humber River Recreational Trail (HRT) 600 metres from Cruickshank Park to Mallaby Park. The remaining 1-kilometre gap is difficult to close due to the challenging site topography and predominance of private property ownership in the valley (**Figure 2**). In Toronto City Council's 2016 Cycling Network 10-Year Plan, Phase 2 of the Mid-Humber Gap project was identified for 2021 implementation, pending the completion of this Feasibility Study and securement of funding by the City of Toronto.

Figure 2 Property Ownership in the Mid Humber Gap (Phase 2) Study Area Source: TRCA, 2019

Existing Conditions

Barriers for pedestrians traveling between Crawford Jones Memorial Park and Mallaby Park are shown below in **Figure 3**. Local roads that do not contain sidewalks are denoted in red. The existing conditions requires trail users to exit the valley at Crawford Jones Memorial Park and travel along Fairglen Crescent before turning down Weston Road to connect to the existing Mallaby Park staircase.

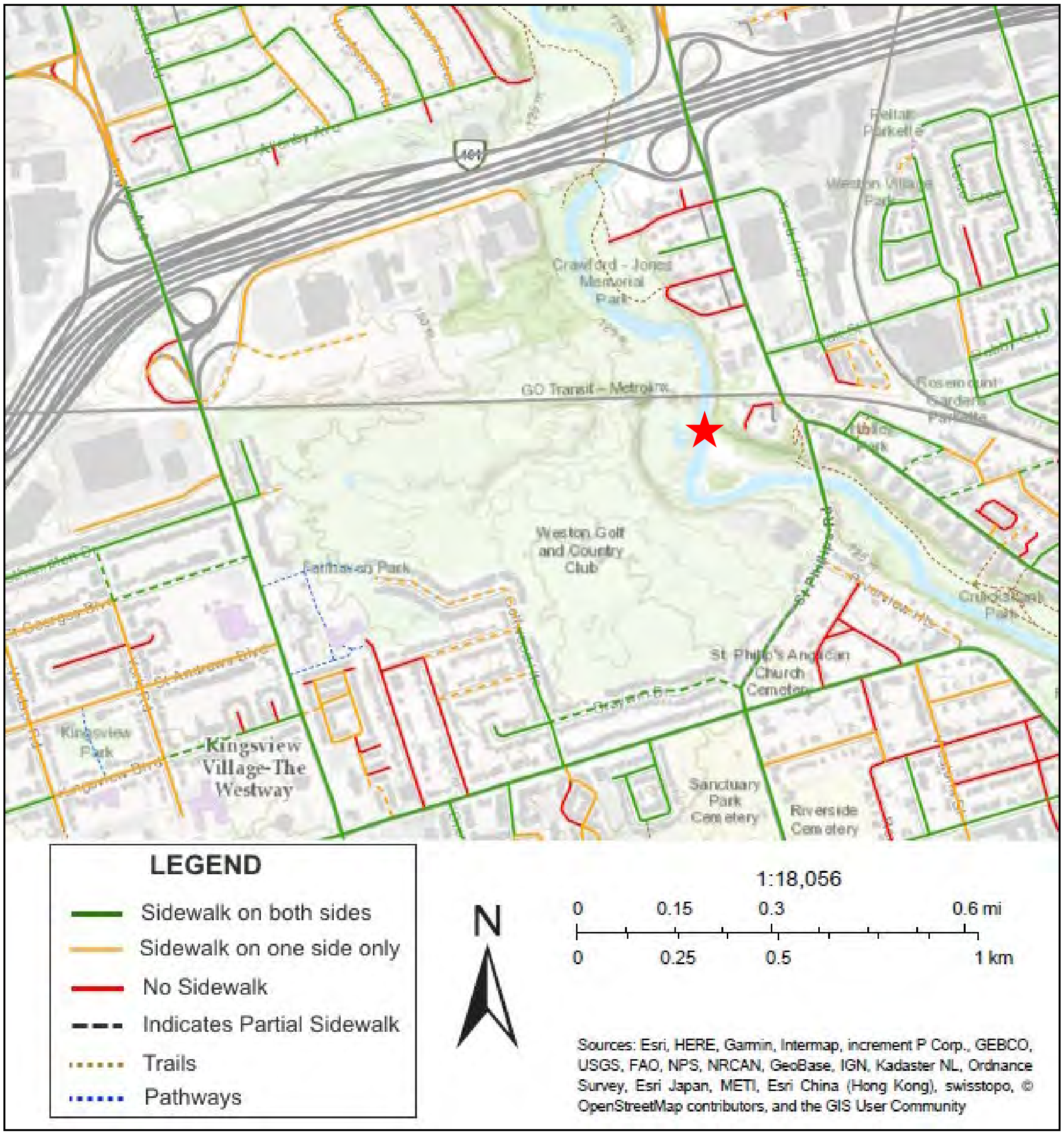

Figure 3 Roadways and Sidewalks in the Vicinity of the Project Area. Sourced from: City of Toronto, 2019

Weston Road, particularly in the vicinity of the Metrolinx bridge, is quite narrow and does not contain designated cycling infrastructure. The existing right of way does not have space for widening to accommodate a trail.

Recommended Trial Alignment Concepts

TRCA has selected two trail alignment concepts that are suitable for recommendation in the future Schedule C MCEA. Section 7 of the Feasibility Study Report summarizes each of the trail alignment concepts in detail and provides an overview of their assessment. The recommended trail alignment concepts, Concept 1A (**Figure 4** & **Figure 5**) and Concept 3, (**Figure 6**) are appended to this summary.

Please note that the trail alignment concepts are informed by limited available baseline data and site topography. Information gaps have been identified at the end of Sections 3, 4 and 5 in the body of the Feasibility Study Report. Most notably, a subsurface investigation is required to inform the placement and design of any proposed water crossings. During the detailed design phase, a complete assessment is required from an ecological, geotechnical, water resources and geomorphologic perspective to inform and refine the proposed trail alignment concepts.

Next Steps

TRCA is to present the finalized Feasibility Study Report to City of Toronto Cycling & Infrastructure staff in summer 2019. Shortly after, City Councillors for Wards 5 and 1 will be briefed on this project. The City of Toronto will initiate the Schedule C MCEA following securement of funding. The City of Toronto will also have to engage private landowners in the study area, as none have been approached during this Feasibility Study. The Weston Golf and Country Club, owners of the private land trust on the east bank of the Humber River, and Metrolinx will all have to be approached to assess their interest in participating in this project.

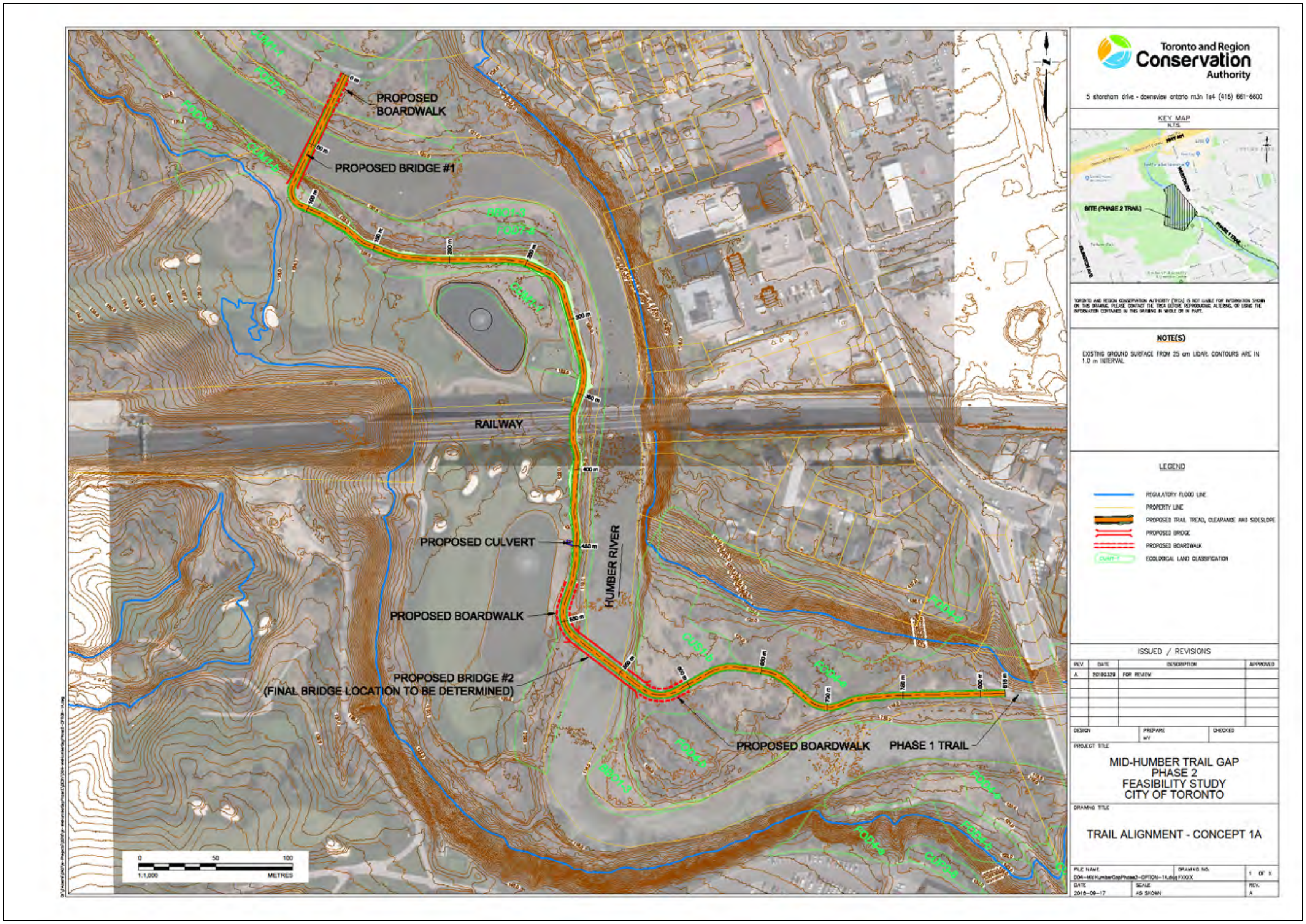

Figure 4 Plan view of Trail Alignment Concept 1A Source: TRCA, 2019

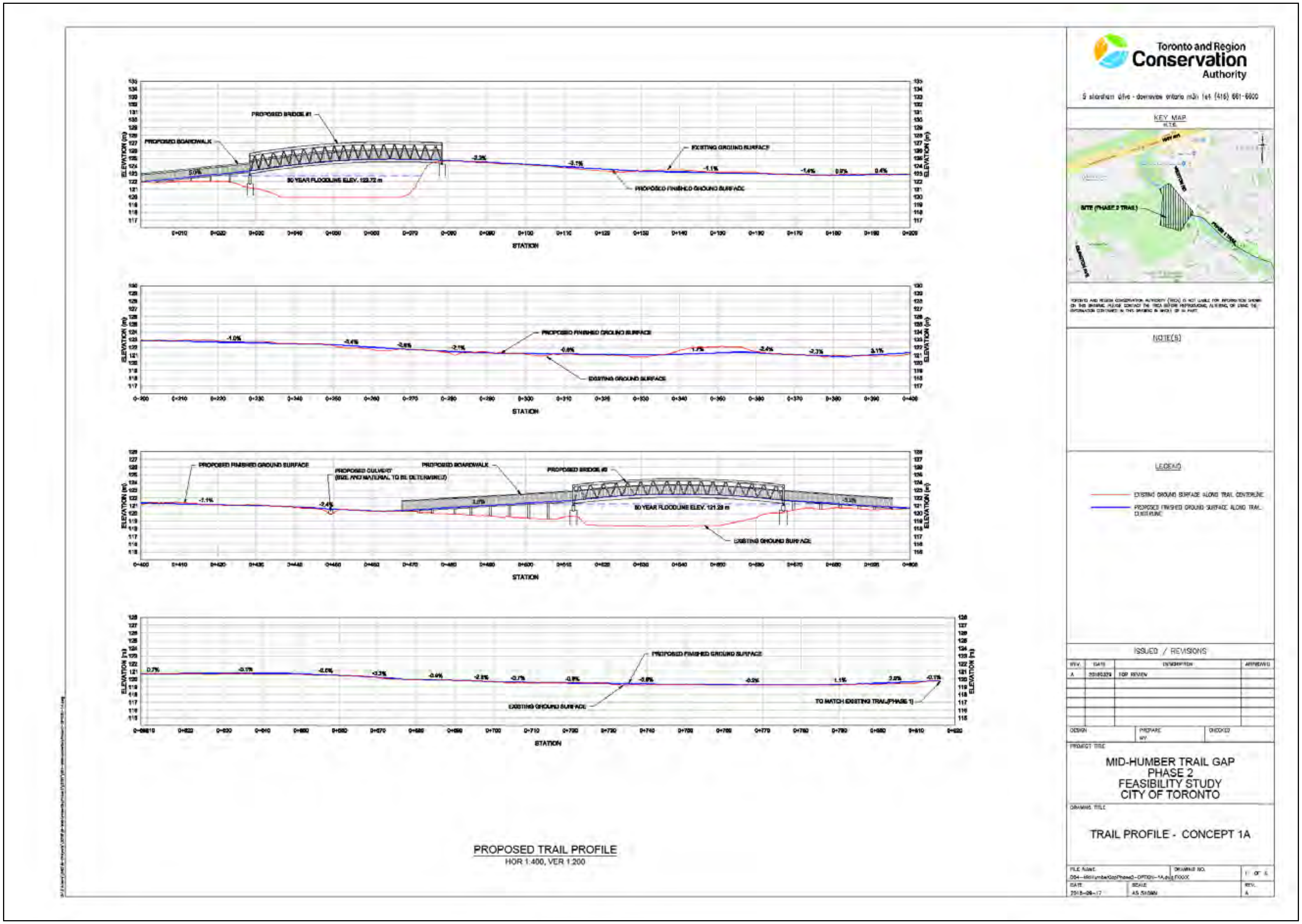

Figure 5 Profile view of Trail Alignment Concept 1A Source: TRCA, 2019

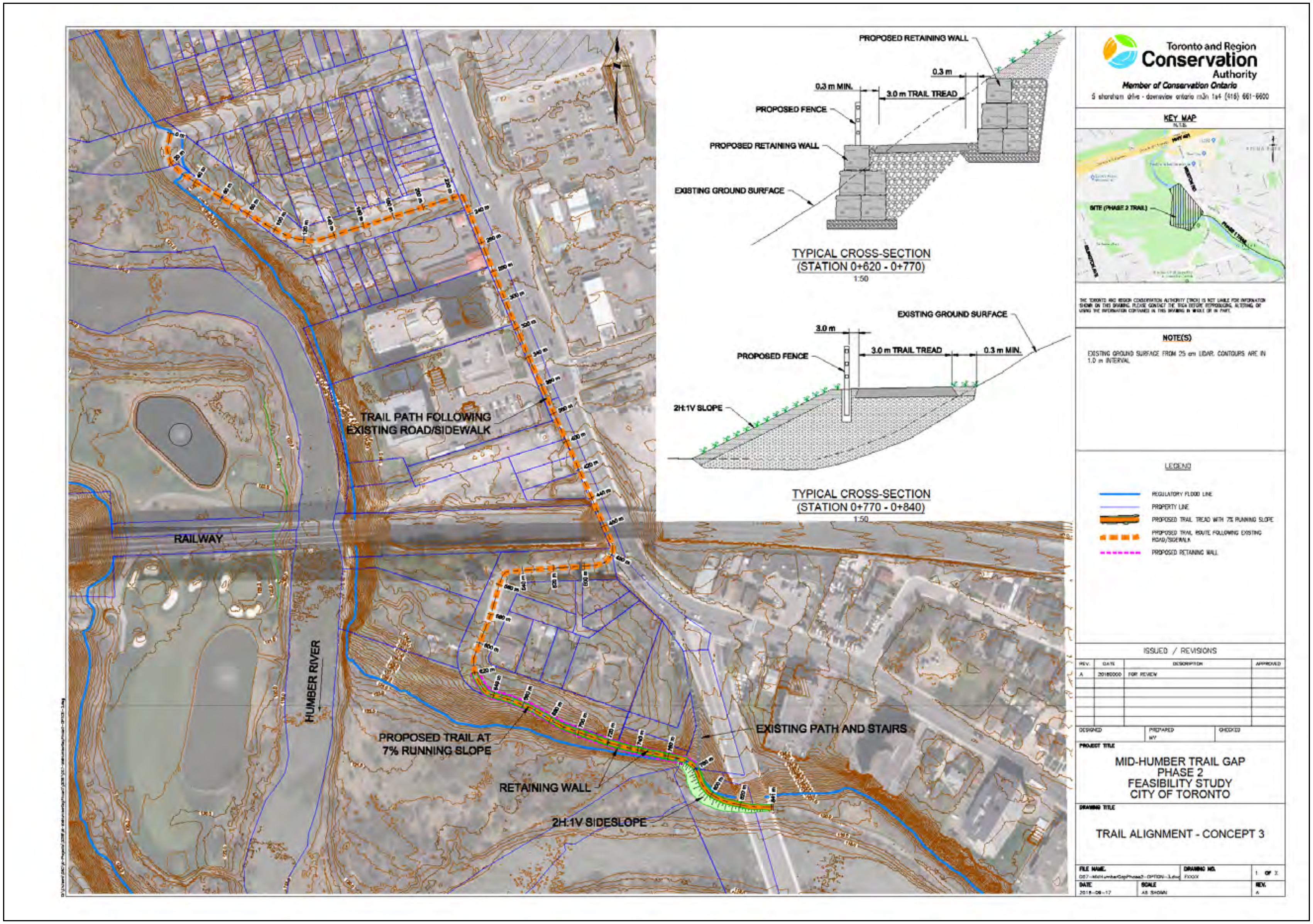

Figure 6 Plan view of Trail Alignment Concept 3 Source: TRCA, 2019

1. Baseline Data

The Mid Humber Gap study area is encompassed within the Albion Sanitary Trunk Sewer System (Albion STS) Class EA Study Area (**Figure 7**). Baseline data collected for the Albion STS was reviewed for this Feasibility Study and has been summarized in Sections 1 through 5 of this report.

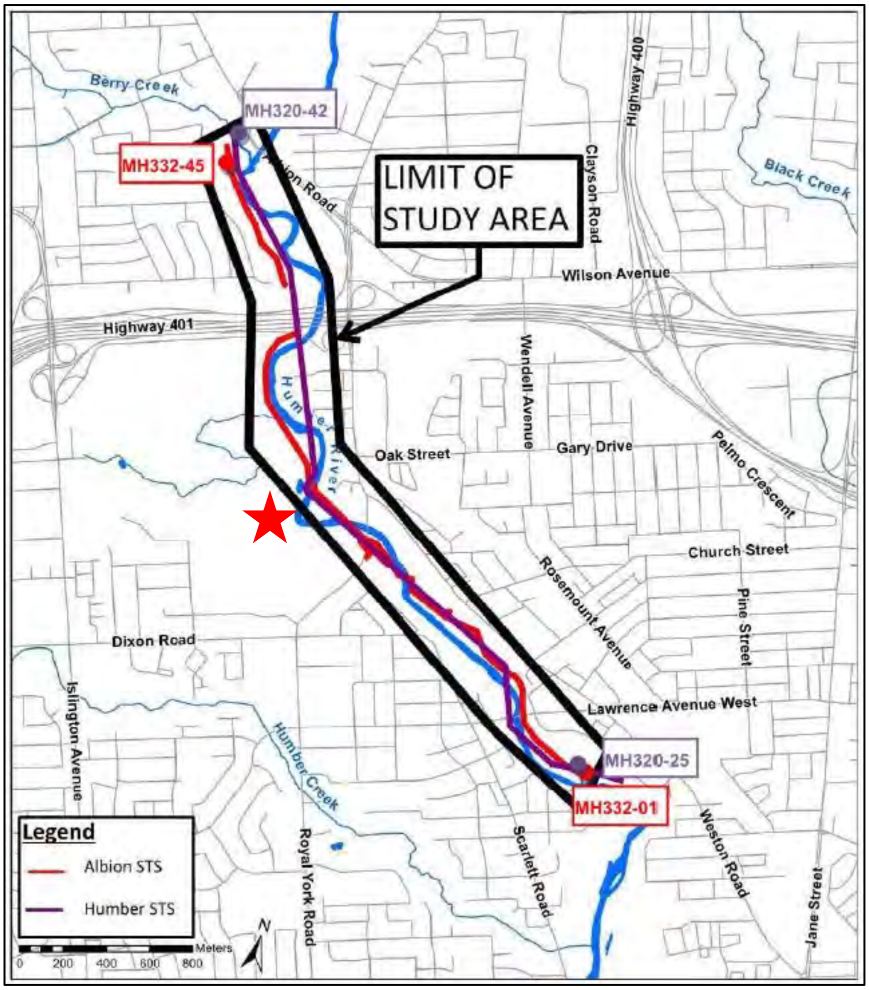

Figure 7 Albion STS Study Area with a Red Star Denoting the Mid Humber Gap Study Area
Source: Hatch Mott MacDonald, 2015

1.1. Stage 1-2 Archaeological Assessment

Review of the Albion STS MCEA Stage 1 Archaeological Assessment indicates that the Mid Humber Gap study area falls within medium and high archaeological potential areas. A Stage 2 Archaeological Assessment will be required to confirm the suitability of any proposed staging areas, access roads and work areas during or following the MCEA phase of this study. Please refer to Figure 1 in Appendix B to see areas of archaeological potential in the Mid Humber Gap study area. As confirmed during the Albion STS MCEA, there are no registered archaeological sites within 1 kilometre of the Mid Humber Gap study area.

1.2. Historic Buildings

Designated historic buildings identified during the Albion STS MCEA, are outside of the Mid Humber Gap study area. There is one listed heritage property at 6 Humberview Crescent, please see Figure 2 in Appendix B for a map showing this information.

1.3. Cultural Environment

The following sections have been adopted from the Stage 1 Archaeological Report completed for the Albion STS MCEA:

1.3.1. Traditional Land Uses

While the (Albion STS MCEA) study area has not been subjected to heavy disturbances, the adjacent area consists of the historic Village of Weston, twentieth century subdivisions, The Weston Golf and Country Club (WGCC) and Highway 401. This demonstrates a history of urban development in the area, and it is possible that evidence of previous settlements has been impacted by these developments or by natural changes near the watercourse.

1.3.2. Aesthetic or Scenic Landscapes

The study area is located within the Humber River valley, between Mallaby Park and Crawford-Jones Memorial Park. This area is of high aesthetic value due to the open green space and vegetative cover. The preferred alternative will consider impacts to this green space and ideally will enhance the usability of this area by members of the public.

1.3.3. Heritage River Systems

The Humber River was designated to the Canadian Heritage Rivers System in 1999 as a result of its outstanding cultural and recreational values. TRCA will engage the Humber River Watershed alliance during the subsequent MCEA stage of this project.

1.4. Surrounding Neighbourhood Community

The majority of the study area is encompassed in Ward 1 – Etobicoke North, on the east bank of the Humber River. The WGCC falls in Ward 5 - York-South Weston, on the west bank of the Humber River. Ward 1 had 805 net new households between 2011 and 2016. For full account of the surrounding neighbourhood community, please refer to Figures 3 through 8 in Appendix B.

2. Existing Infrastructure

2.1. Cyclist and Pedestrian Routes

The existing cycling network (**Figure 8**) necessitates the use of on-street surface routes that do not contain designated cycling infrastructure. Sections of Weston Road, particularly in the vicinity of the Metrolinx rail bridge are extremely narrow, making cycling uncomfortable and unsafe.

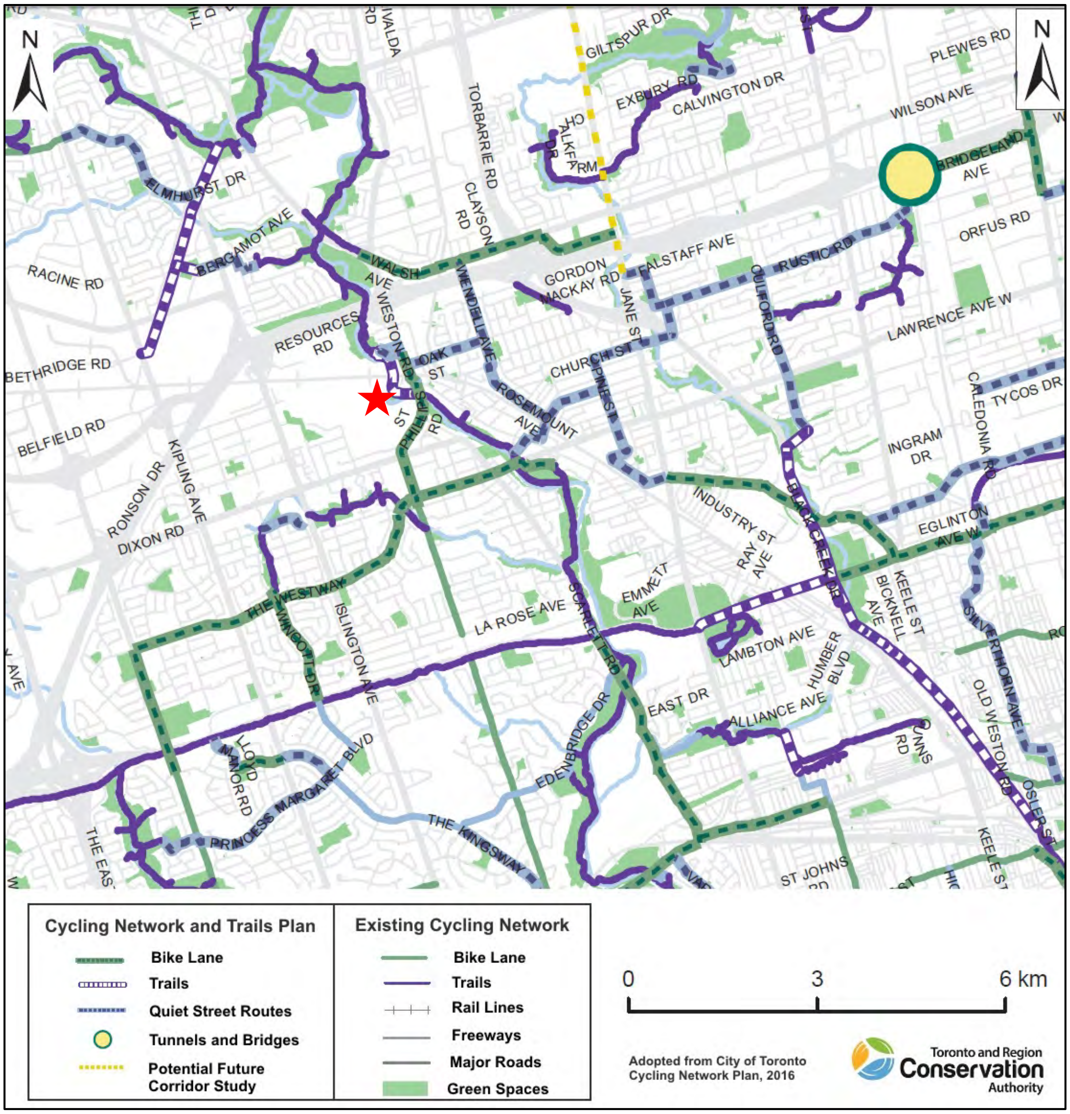

Figure 8 2016 City of Toronto Cycling Network Existing and Planned Trails in the Vicinity of the Study Area Source: City of Toronto, 2018

Figure 9 below highlights barriers for pedestrians traveling between Crawford Jones Memorial Park and Mallaby Park. Local roads that do not contain sidewalks are denoted in red. This barrier is further explored in Section 7.3.4.

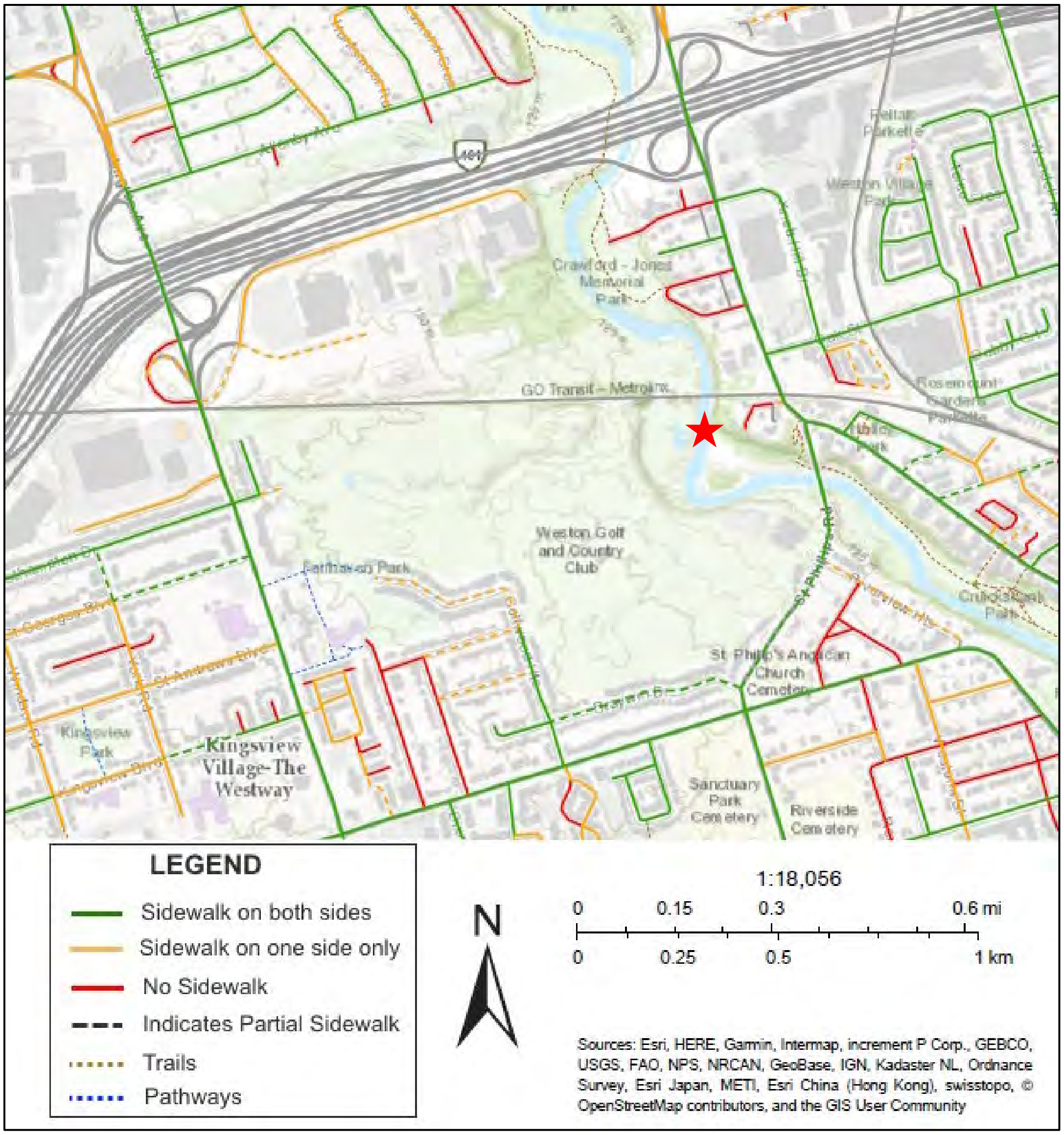

Figure 9 Roadways and Sidewalks in the Vicinity of the Project Area. Sourced from: City of Toronto, 2019

2.2. Retail and Dwellings in the Study Area

2.2.1. Weston Coin Car Wash – 2530 Weston Road

Weston Coin Car Wash is located at the Weston Road and Fairview Crescent intersection. A review of TRCA's available property boundary information indicates a lack of space between this property parcel and the Weston Road right of way to facilitate a trail.

2.2.2. 2464 Weston Road – Commercial Block

Weston on the Humber Condos is a high-rise residential unit located along the east bank of the Humber River in the study area. A 3-storey commercial building containing a nail salon, clothing store and beauty supply store is also located at the front of this property parcel. A review of TRCA's available property boundary information indicates a lack of space between this property parcel and the Weston Road right of way to facilitate a trail.

2.2.3. Country Club Towers - 2450 & 2460 Weston Road

Country Club Towers are two high-rise residential apartment buildings managed by Q Residential on Weston Road. The towers are located near the top of slope on the east bank of the Humber River. Country Club Towers property ownership impacts the feasibility of installing a trail along Weston Road. This barrier is further discussed in Section 7.3.4.

2.2.4. Loblaws – 2425 Weston Road

A Loblaws Grocery store and Loblaws Gas Bar are located on the east side of Weston Road. All property parcels between Weston Road and Knob Hill Drive are owned by Loblaws.

2.2.5. Fine Tuned Auto Services – 2441 & 2443 Weston Road

Fine Tuned Auto Services is an auto repair shop on the east side of Weston Road. A review of TRCA's available property boundary information indicates a lack of space between this property parcel and the Weston Road right of way to facilitate a trail.

2.2.6. Metrolinx

Metrolinx owns three property parcels on the east side of Weston Road located at 2147, 2427 and 2431 Weston Road. Metrolinx also owns four parcels on the west side of the road: 2428, 2426, 2430 and 2434 Weston Road. These property parcels are mostly undeveloped and appear to be used by Metrolinx for storage and maintenance of the rail bridge.

2.2.7. Humberview Crescent

Review of available Aerial Photographs in the study area indicates that homes along Humberview Crescent were built prior to 1946. Please refer Figures 9 to 14 in Appendix B to see historic aerial photos of the project area. The homeowners located along Humberview Crescent jointly own the private land trust on the east side of the Humber River in the study area. Please refer to Section 10.2 for more information regarding private property ownership.

2.2.8. Weston Golf & Country Club

The WGCC was originally constructed as an 9-hole course in the early twentieth century, and has expanded into the 68.3 hectare, 18-hole course that it is today. The WGCC owns all property on the west side of the Humber River in the Mid Humber Gap study area. Please refer to Section 10.1 for more information regarding private property ownership.

2.3. Existing Parks and Trails

2.3.1. Pan Am Path West – Humber River Recreational Trail

The Pan Am Path West begins at the Claireville Dam and connects through urban green space south to the Martin Goodman Trail on the Lake Ontario waterfront. The Mid Humber Gap is one of two gaps in this 29-kilometre trail system.

2.3.2. Crawford-Jones Memorial Park

Crawford-Jones Memorial Park is a 9.4-hectare park named after notable Toronto homicide detective, Jim Crawford, and contractor, Herb Jones. Both men saved dozens of people from the rising flood waters in the Humber River following Hurricane Hazel using a boat to reach rooftops (Albion STS MCEA). Today, this public park features mature forests and is a termination point of the HRT.

2.3.3. Mallaby Park

Mallaby Park is a small park located at the junction of St. Phillips Road and Weston Road. The park features a small path with park benches and connects into the Humber River valley via the Mallaby Park staircase. Mallaby Park is an existing termination point in the HRT.

2.3.4. Cruickshank Park

Cruickshank Park is an 11.9-hectare park located on the east side of the Humber River, downstream of the St. Phillips Road bridge. This park land was donated by the Cruickshank family to the Town of Weston as a memorial to James Cruickshank in 1929 (Albion STS, MCEA). Today, this park contains outdoor fitness equipment and a children's playground. Phase 1 of the Mid Humber Gap project constructed a trail to connect Cruickshank Park and Mallaby Park via the HRT.

2.4. Existing Transportation

2.4.1. Metrolinx Bridge/Rail Corridor

The Metrolinx Bridge, formerly known as the Grand Trunk Railway was constructed for transport between Toronto and Sarnia in 1856. Within the study area, this rail bridge stands 20 metres tall and 170 metres long, on nine piers across the Humber River. The original bridge was brick construction and has since been reinforced with concrete (Albion STS MCEA, 2015). Presently this rail line is used by GO Transit as a means for traveling to Brampton, and has been expanded for the UP Express, linking to the Pearson Airport.

2.4.2. St. Phillips Road Bridge

The St. Philips Road bridge over the Humber River was once known as the Wadsworth Bridge on Humber Street. The original bridge was wood construction and was later re-built as a concrete arch bridge in 1910. The approaches to the arch bridge were washed out during Hurricane Hazel in 1954. Following Hurricane Hazel, the bridge was repaired to its current configuration and the name of the road changed to St. Phillips Road (Albion STS MCEA, 2015).

2.4.3. Weston Road

Weston Road was constructed in the 1800s to connect Dundas Street to the village of Weston (Albion STS MCEA, 2015). In the study area, Weston Road has two north and two south travelling lanes. There are markings on the road for cyclists, but the road is quite narrow and without a shoulder, particularly in the vicinity of the Metrolinx bridge. Weston Road is serviced by the TTC via routes 89 Weston and 73C & 73D Royal York which adds to the volume of traffic on this arterial road.

2.5. Toronto Water and Erosion Control Infrastructure

Conversations with the City of Toronto undertaken during the Albion STS MCEA indicate that the Albion STS was originally built sometime between 1960 and 1962. **Figure 10** below shows the location of Toronto Water Infrastructure in the study area. Table 1 and Figures 15 through 17 in Appendix B summarize TRCA inspection data of Toronto Water assets and erosion control infrastructure in the study area.

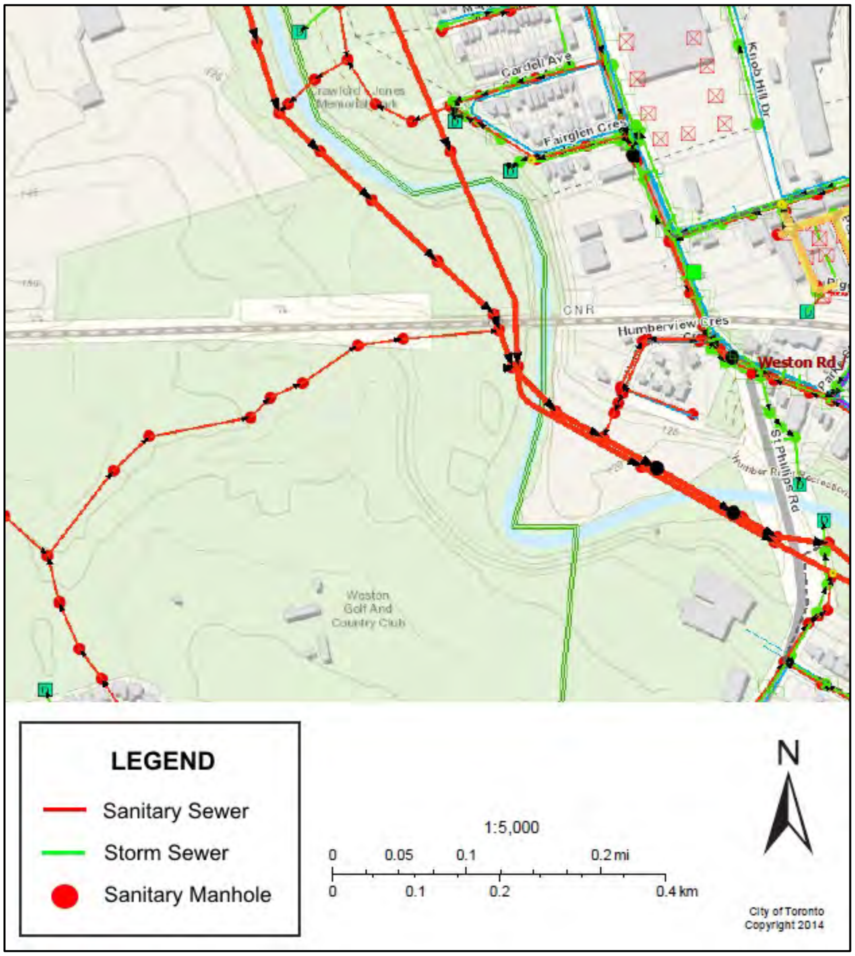

Figure 10 TWAG Imagery in the Study Area Source: TWAG, 2019

2.6. Pre-design Utility Locates

The National Energy Board's interactive pipeline map indicates that there are no known federally regulated pipelines in the study area. There are no known major projects initiated by Infrastructure Ontario in the vicinity of the study area. If required, pre-design utility locates will be completed during subsequent phases of this study. The presence of utilities may influence the selection of the preferred trail alignment.

3. Ecological Data

As noted in TRCA's 2008 Humber River Watershed Plan, the study area contains poor to very poor habitat patch quality. Please refer to the Terrestrial System – Existing Conditions Landscape Analysis Map (Figure 18 in Appendix B) for an illustration of this information.

3.1. Tree Inventory, Flora/Fauna & ELC Data

Ecological Data available from the Albion STS MCEA is summarized in Table 2 and shown in Figures 18 to 23 in Appendix B. As part of the Albion STS MCEA, an Ecological Land

Classification (ELC) was completed for the study area. One parcel of TRCA owned property on the east bank of the Humber River, below the apartment complex at 2640 Weston Road was not assessed. **Figure 11** below shows the ELC codes within the study area.

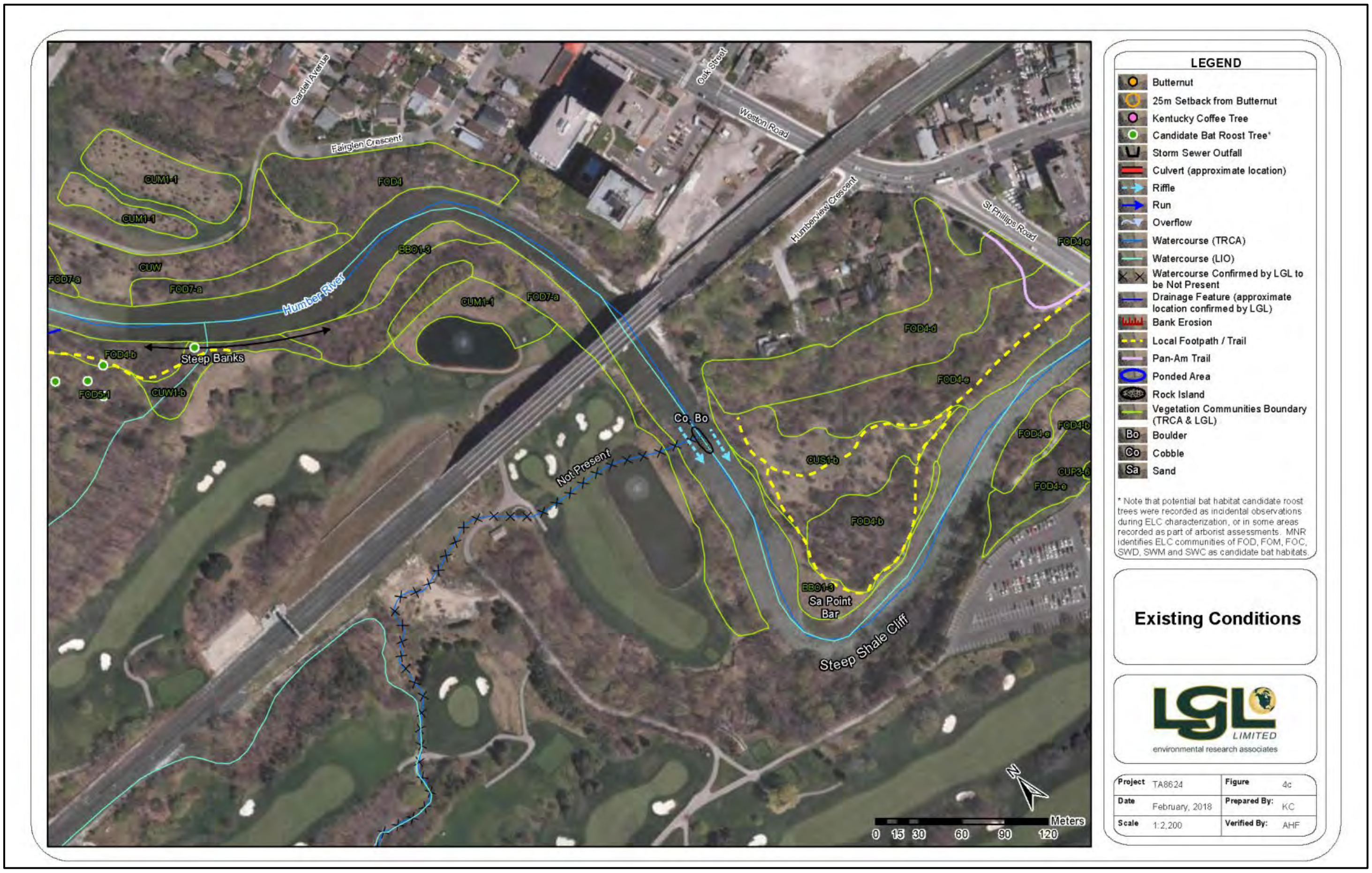

Figure 11 ELC Data for the Study Area Collected by LGL Limited for the Albion STS MCEA
Source: LGL Limited, 2015

TRCA Species and Vegetation Community Level of Concern Rankings

TRCA has ranked and categorized the flora and fauna species and vegetation communities depending on the level of concern for each species; these are known as "L-Ranks." L-Ranks provide a measure of biological significance, or abundance within the context of the Greater Toronto Area. L-Ranks are assigned according to a variety of biological criteria including provincial and national significance and represent a scale of significance ranging from L1 to L5. L1 represents high significance and L5 represents low significance. A ranking of L+ indicates a non-native species or vegetation community, and LX indicates extirpated species. L-Rank descriptions are summarized below in **Table 1**.

Table 1 Typical L-Rank Description. *Source: TRCA, 2011*.

Status	Description
L1	Extremely significant in the TRCA Region due to rarity, stringent habitat needs, and/or threat to habitat.
L2	Highly significant: occurs in high-quality natural areas and is probably declining in the Greater Toronto Area. It is often already considered rare.
L3	Locally significant: generally occurs in the natural area rather than in cultural areas; may be vulnerable to decline.
L4	Generally secure: may be a conservation concern in a few specific situations.
L5	Dependent on degraded, often urban habitats; not of conservation concern.
L+	Non-native species or floral community which generally requires management unless special conservation concern exists.

TRCA L-Ranks for each ELC community in the study area are summarized in **Table 2** below.

Table 2 Summary of ELC Communities in the Study Area

ELC Code	Vegetation Type	Species Association	Community Characteristics
Terrestrial – Natural/Semi Natural **BBO:** Open Beach Bar			
BBOI-3 **L3 – Community of Regional Conservation Concern**	Reed-canary Grass Mineral Open Beach	**Ground Cover:** Reed Canary (*Phalaris arundinaceae*), Field Horsetail (*Equisetum arvensis*), Tall White Aster (*Aster lanceolatus ssp. lanceolatus*), Awnless brome, tufted vetch, Canada goldenrod, wild teasel, Canada thistle.	Cover varies from patchy and barren to more closed and treed. Tree cover ≤ 25% and shrubs ≤ 25%. Subject to active shoreline processes (ice scour, wave energy, erosion and deposition)
Terrestrial – Cultural **CUM1:** Mineral Cultural Meadow			
CUM1-1 **Not Ranked**	Dry-Moist Old Field Meadow	**Ground Cover:** Awn less Brome (*Bromus inermis ssp. inermis*),	Tree cover and shrub cover< 25 % (CUM).

		Common Ragweed (*Ambrosia artemisiifolia*), Red Clover (*Trifolium pratense*), White Sweet Clover (*Melilotus alba*), Black Medic (*Medicago lupulina*), Canada Thistle (*Cirsium arvense*) and Canada Goldenrod (*Solidago canadensis*).	This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1-l). Grass and forb dominant. Community resulting from, or maintained by, anthropogenic-based influences.
CUW1: Mineral Cultural Woodland			
CUW1-b **L+** Community of predominantly introduced species	Exotic Successional Woodland	**Canopy:** composed of a mixture of tree species which include Black Walnut, Austrian Pine (*Pinus nigra*), Blue Spruce (*Picea pungens*), White Elm (*Ulmus americana*), White Cedar, Black Walnut, Manitoba Maple, Apple (*Malus pumila*), and Red Ash (*Fraxinus pensylvanica*)	Cultural communities (CU). Tree cover between 35 and 60 % (W). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (l). Community resulting from, or maintained by, anthropogenic-based influences.
CUS1: Mineral Cultural Savannah			
CUS1-b **L+** Community of predominantly introduced species	Exotic Successional Savannah	**Canopy:** dominated by a mixture of exotic woody species. Hawthorn (*Crataegus sp.*), Russian Olive (*Eleagnus angustifolia*), Siberian Elm, Apple (*Malus pumila*) , Black Walnut **Understory:** Tartarian Honeysuckle, Common Buckthorn, Staghorn Sumac (*Rhus typhica*)	Cultural community (CU) Tree cover between 25 % and 35% (S). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (l) dominated by exotic species (c). Community resulting from, or maintained by,

		Ground Cover: Awnless brome, tufted vetch, Canada goldenrod, wild teasel, Canada thistle, Dog Strangling Vine	anthropogenic-based influences.
Terrestrial – Natural/Semi Natural **FOD4:** Dry – Fresh Deciduous Forest			
FOD4-b **L+** Community of predominantly introduced species	Dry-Fresh Manitoba Maple Deciduous Forest	**Canopy:** dominated by Manitoba Maple (*Acer negundo*), with minor associations of Basswood, White Elm (*Ulmus americana*), Norway Maple (*Acer platanoides*) and Siberian Elm (*Ulmus pumila*)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moderately dry to fresh soils with well to moderate drainage typically occurring in the upper to middle slope (4).
FOD4-d **L+** Community of predominantly introduced species	Dry-Fresh Norway Deciduous Forest	**Canopy:** Dominated by Norway Maple, White Ash (*Fraxinus americana*), Black Cherry (*Prunus serotina*) and Manitoba Maple (*Acer negundo*).	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (0). Moderately dry to fresh soils with well to moderate drainage typically occurring in the upper to middle slope (4)
FOD4-e **L+** Community of predominantly introduced species	Dry-Fresh Exotic Deciduous Forest	**Canopy:** dominated by Siberian Elm (*Ulmus pumila*), with Black Locust, and Manitoba Maple	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moderately dry to fresh soils with well to moderate drainage typically occurring in the upper to middle slope, (4).
FOD7-a **L5**	Fresh - Moist Manitoba Maple Lowland	**Canopy:** Canopy: Manitoba Maple dominant with Hybrid Willow (*Salix x*	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically

Community not of concern at this time	Deciduous Forest	*sepulcralis*), White Elm and Siberian Elm. **Understorey:** Tartarian Honeysuckle (*Lonicera tatarika*), Wild Red Raspberry (*Rubus idaeus ssp. strigosus*), Multiflora Rose (*Rosa multiflora*) and Common Buckthorn (*Rhamnus cathartica*) as associates. **Ground Cover:** Spotted Touch-me-not (*Impatiens capensis*), Canada Goldenrod (*Solidago canadensis*), Yellowish Enchanter's Nightshade (*Circaea lutetiana ssp. canadensis*), Sweet Cicely (*Osmorhiza claytonia*) and Yellow Avens (*Geum aleooicum*).	occurring in the lower slope, bottomlands such as floodplains (7). Dominated by Manitoba (-a).

An Arborist Report was prepared by LGL Limited in December 2017 for the Albion STS MCEA. The Mid-Humber Gap study area is encompassed within this larger tree inventory. Please refer to Appendix B to see this information. Please note that in order to thoroughly assess the ecological impact of each trail alignment concept, the average basal area of ELC vegetation community is required. TRCA does not currently have this information.

3.2. Environmentally Significant Area Screening

Environmentally Significant Areas (ESA) are spaces designated by the City of Toronto as containing environmentally significant qualities. There are no known ESAs in the study area.

3.2.1. ANSI

There are no known areas of natural or scientific interest in the study area. **Figure 12** below shows the location of non-evaluated wetlands in the study area. The non-evaluated wetland just west of St. Phillips Rd. on the west (south) bank may indicate that there is seepage occurring from the coincident slope, complicating the construction of a trail in this area. Please note that TRCA recommends a 10-metre setback of proposed development from wetland features.

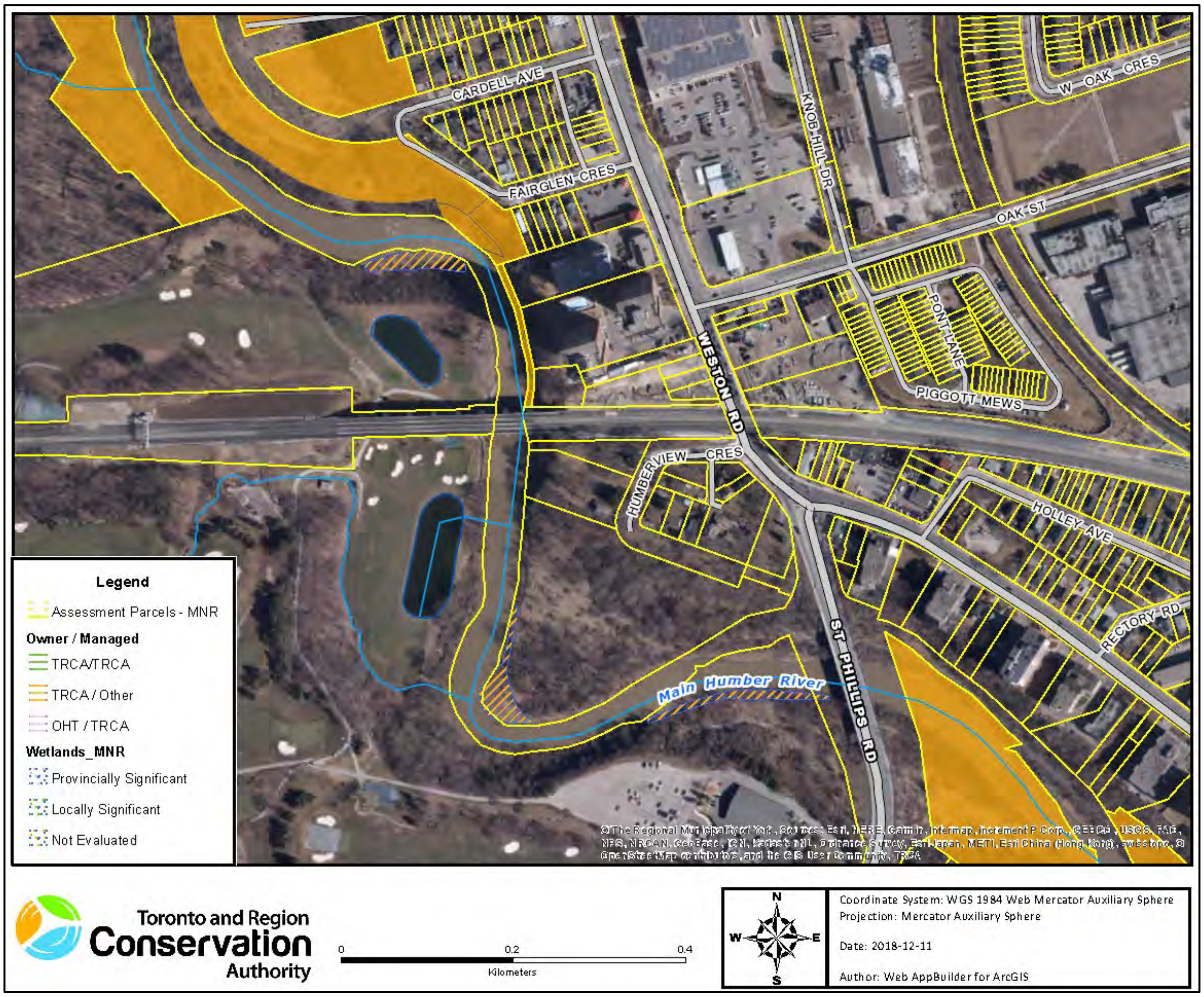

Figure 12 Location of Not Evaluated Wetlands in the Mid Humber Gap Study Area Source: TRCA, 2018

3.2.2. SAR Screening

There are no known SAR in the study area. TRCA submitted a request for screening to the MNRF on October 9, 2018. MNRF confirmed no concerns on January 24, 2019. Data pulled from the Natural Heritage Information Centre website indicate one Eastern Wood Pewee sighting within 1 km of the study area. The Eastern Wood Pewee is categorized as special concern both provincially and federally. TRCA will screen the project area for SAR in subsequent phases of this study. Data collected for the Albion STS MCEA indicates that there are no SAR in the Mid Humber Gap study area.

3.3. Fisheries Station Data

There is one Regional Watershed Monitoring Program (RWMP) Fisheries Monitoring Station (HU007WM) located in the study area. Please refer to Figures 24 and 25 in Appendix B for the location of this Fisheries Monitoring Station and the Fish Management Zones. Fish samples were last collected in 2016 and contained a dominance (50%) of longnose dace, which is a moderately tolerant, cool-water native species. Table 3 contains a summary of the sample collected.

Table 3 Summary of Fish Species Collected from Station HU007WM

Species	Tolerance	Thermal Regime	Native or Introduced	Spawning Period	Percent, by count
Longnose Dace	Intermediate	Cool-water	Native	Spring-summer	50
Common Shiner	Intermediate	Cool-water	Native	Spring	18
Stonecat	Tolerant	Warm-water	Native	Summer	16
River Chub	Tolerant	Cool-water	Native	Spring	9
Rock Bass	Intermediate	Cool-water	Native	Spring	2
Spottail Shiner	Intermediate	Cool-water	Native	Spring	1
Rainbow Darter	Intolerant	Cool-water	Native	Spring	1
Fantail Darter	Intolerant	Cool-water	Native	Spring	< 1
Central Stoneroller	Intermediate	Cool-water	Introduced	Spring	< 1
Rosyface Shiner	Intermediate	Warm-water	Native	Spring-summer	< 1
Johnny Darter	Tolerant	Cool-water	Native	Spring	< 1
White Sucker	Tolerant	Cool-water	Native	Spring	< 1

3.4. Benthic Invertebrates

As noted in the 2008 State of the Humber Watershed Report, 5 of 7 RWMP Fisheries Monitoring Stations were noted as potentially impaired. The two unimpaired stations are in the upper reaches of the Lower Humber. The location of each station is shown below in **Figure 13**.

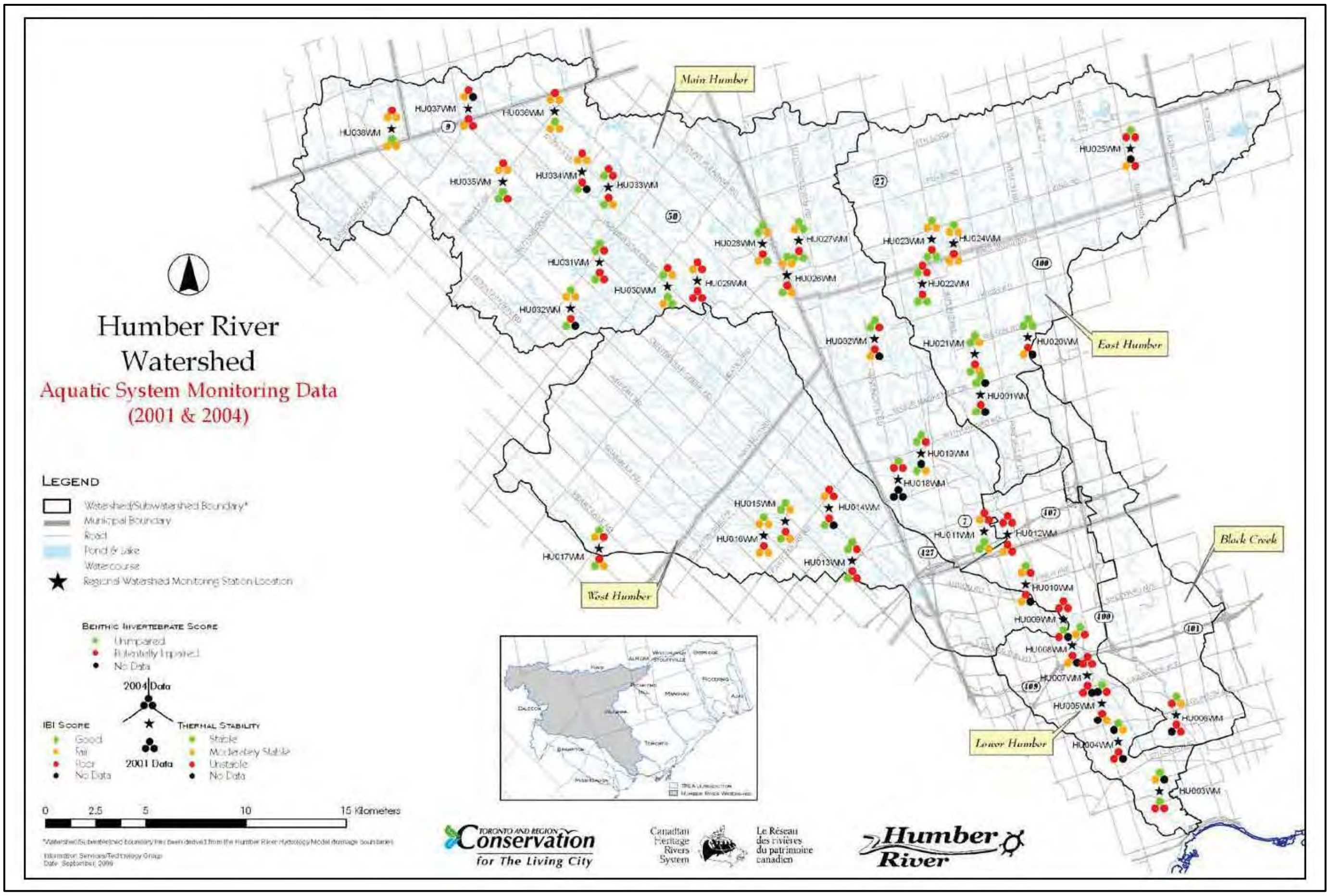

Figure 13 Aquatic System Monitoring Data (2001 and 2004) Source: TRCA, 2008

3.5. Ecological Information Gaps

The following information should be collected for any recommended trail alignment concepts and used to further assess trail alignment concepts in subsequent phases of this study:

- Delineation of the full area of disturbance to the natural feature including all grading areas, temporary access routes, staging/stockpiling areas, clearance along retaining walls for maintenance, crane pads and associated clearing areas to assist in quantifying the amount of all woody vegetation proposed to be removed from the natural system
- An Environmental Impact Study (EIS) or Natural Heritage Evaluation (NHE) to be competed in accordance with TRCA EIS Guidelines
- Restoration Plan to be created in accordance with TRCA's Post Construction Restoration Guidelines and Forest Edge Management Plan Guidelines
- Maintenance and Monitoring plan for the plantings according to TRCA's Guideline for Determining Ecosystem Compensation
- Erosion and Sediment Control Plans
- Water Balance Assessment for Groundwater as the project area is located within a groundwater recharge area (Figure 26 in Appendix B)

- Determination of the extent of cut or fill of all proposed minor earth works.

4. Geotechnical Data

4.1. Ontario Geotechnical Borehole Data

Figure 14 Location of Ontario Geotechnical Borehole Data in the Study Area Source: Google Earth, 2018

Data are available for 6 Ontario Geotechnical Boreholes in the vicinity of the study area, the borehole locations can be seen in **Figure 14**. Available information from these boreholes is summarized below in **Table 4**.

Table 4 Summary of Ontario Geotechnical Borehole Data in the Study Area

Bore-hole ID	Year	Elevation (DEM)	Total Depth	Static Water Level (m)	Depth (m)	Soil
642509	1962	130	5	-	0 - 1.6	fill, sand, silt, clay, brown, loose
					1.6 - 2	silt, sand, organic, black, loose
					2 - 3.1	sand, silt, brown, loose
					3.1 - 5	till, silt, sand, clay, brown, dense

655556	1963	134.9	-999	-	0 - 0.3	soil
					0.3 - 2.7	silt, sand, organic, brown, loose
					2.7	till, silt, clay, sand, grey, hard
650635	1969	128.6	10.4	-	0 - 0.3	soil, black
					0.3 - 2.7	sand, silt, brown, compact, medium grained
					2.7 - 7.6	till, clay, silt, gravel, brown, stiff
					7.6 - 10.4	till, silt, clay, gravel, grey, hard
652194	1965	120.3	4.9	0.1	0 - 1.2	gravel, stones, sand, silt
					1.2 - 4.9	bedrock, shale, limestone, grey
652193	1965	123.9	3.7	-	0 - 1.8	fill, silt, clay, gravel, brown, dense
					1.8 - 3.6	alluvion, silt, sand, organic, wet
					3.6 - 3.7	bedrock, shale
652192	1965	127.5	5.6	-	0 - 2.3	fill, silt, soil
					2.3 - 3.6	sand, gravel, dense
					3.6 - 5.6	bedrock, shale

* -999 for Borehole 655556 reading is assumed to be an error in depth reading

4.2. Albion STS Boreholes

The location of boreholes drilled for the Albion STS are shown below in **Figure 15**. For a view of borehole logs and bedrock core photographs, please refer to Figures 27 and 28 in Appendix B.

Figure 15 Location of Albion STS MCEA Boreholes in the Study Area Source: TRCA, 2018

4.3. Oakridges Moraine Groundwater Program (ORMGP) Geoportal

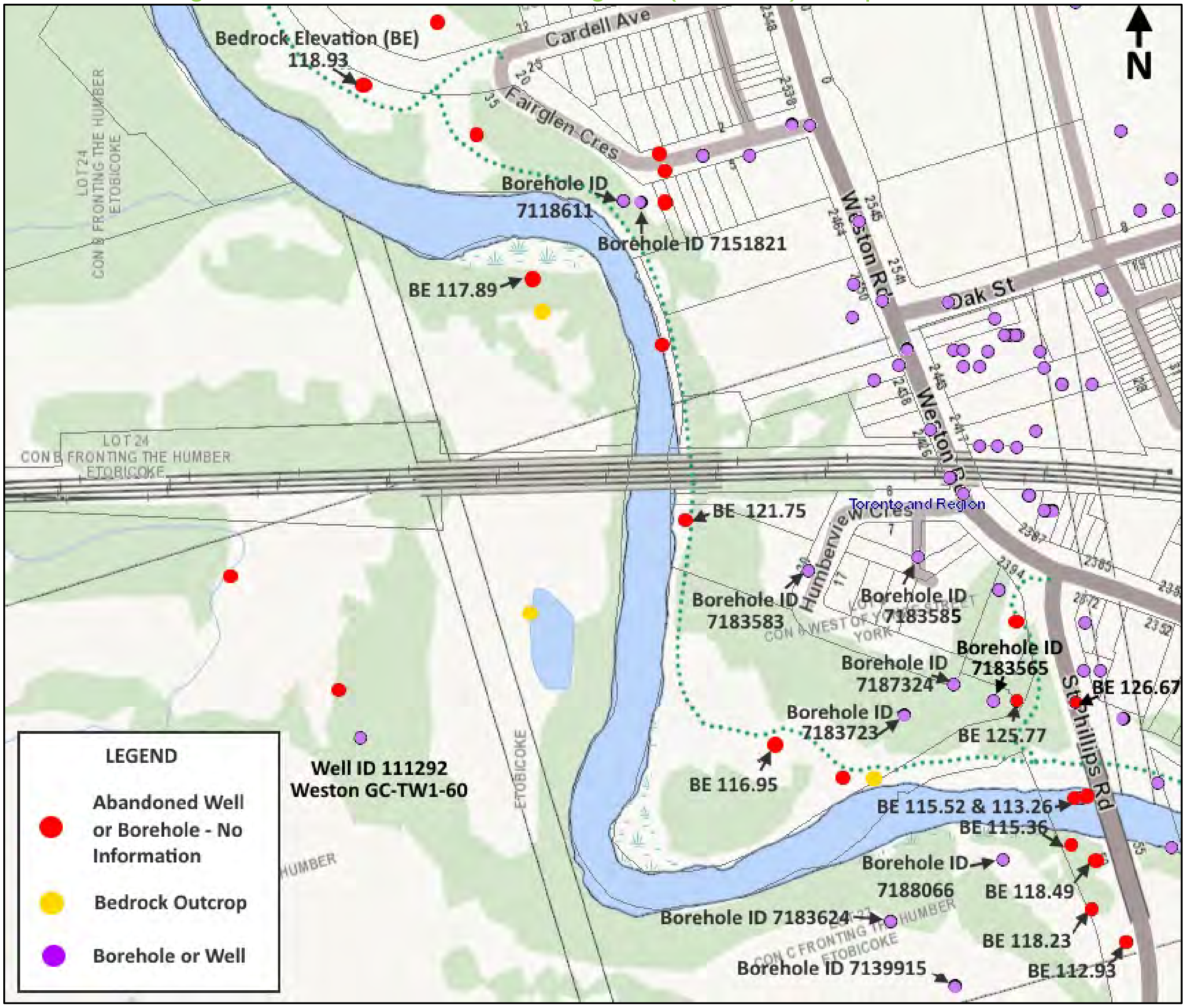

Figure 16 Location of Oak Ridges Moraine Groundwater Program Geoportal Data Points
Source: ORMGP Geoportal, 2018

Data are available for 8 Oak Ridges Moraine Groundwater Program Boreholes in the vicinity of the study area, the borehole locations can be seen in **Figure 16**. Available information from these boreholes is summarized below in **Table 5**.

Table 5 Summary of Oak Ridges Moraine Groundwater Program Geoportal Data Points

Borehole ID	Year	Total Depth	Depth (m)	General Colour	Most Common Material	Other Materials	General Description
7118611	2008	7.0 metres	0 - 1.8	Brown	Sand	Gravel	Fill
			1.8 - 3.2	Brown	Clay	Till	Hard

			3.2 - 7.0	Grey	Silt	Till	Hard
7139915	2009	15 feet (4.572 metres)	0 - 1.2	Brown	Sand	Gravel	Loose
			1.2– 2.4	Brown	Silt	Sand	Moist
			2.4 - 4.6	Grey	Clay	Clay	Soft
7183565	2012	14.5 feet (4.4916 metres)	0 - 1.5	Brown	Gravel	-	Loose
			1.5 - 3.0	Black	Sand	-	Moist
			3.0 - 4.4	Grey	Clay	-	Wet
7183583	2012	11.28 feet (3.438 metres)	0 - 0.46	Brown	Sand	-	Loose Dry
			0.46 - 1.02	Brown	Sand	Gravel	
			1.02 - 1.9	Grey	Clay	Sand	Hard
			1.9 - 3.4	Grey	Clay	Stones, Pebbles	Hard
7183624	2012	2.2 feet (0.67056 metres)	0 - 0.67	Brown	Sand	-	Soft
7183723	2012	16 feet (4.8768 metres)	0 - 1.5	Brown	Gravel	-	Fill
			1.5 - 3.0	Black	Sand	-	Moist
			3.0 - 4.9	Grey	Clay	-	Wet
7183724	2012	16 feet (4.8768 metres)	0 - 1.5	Brown	Gravel	-	Loose
			1.5 - 3.0	Black	Sand	-	Moist
			3.0 - 4.4	Grey	Clay	-	Wet
7188066	2012	1 foot (0.3048 metres)	0 - 0.30	Brown	Topsoil	-	Soft

			0.30 - 0.30	Brown	Coarse Sand	-	Dense

4.4. Geotechnical Information Gaps

The following information should be collected for any recommended trail alignment concepts and used to further assess trail alignment concepts in subsequent phases of this study:

- Should bridge crossings be part of the recommended alternative, a geotechnical investigation will be required at the detailed design phase to collect borehole data at the location of all proposed bridge abutments
- A geotechnical engineer must confirm that all bridge abutments are outside of the long-term stable slope inclination line drawn from the setback of the toe erosion allowance
- Abutments must be designed by a structural engineer at the detailed design phase
- A geotechnical engineer must also complete a global stability analysis (factor of safety of 1.5) for each bridge to ensure that the structures are not undermined in the long term due to erosion and slope instability
- If toe protection will be incorporated into the design, all applicable fluvial geomorphological, water resources, ecological and geotechnical aspects must be assessed and considered
- A global stability analysis is required for all proposed retaining walls to confirm that a minimum factor of safety of 1.5 is met
- Any proposed buttresses must consider the toe erosion allowance and be properly keyed into the bank or slope, as confirmed by a geotechnical engineer.

5. Fluvial Geomorphological and Erosion Assessment

5.1. Summary of Albion STS Fluvial Geomorphic Study

As noted in the Fluvial Geomorphology Report completed for the Albion STS MCEA, a portion of the Mid-Humber Gap study area contains exposed bedrock along the channel bed and toe of the banks. Bedrock is exposed approximately 220 metres upstream of the CNR Bridge for approximately 100 to 150 metres. Elsewhere, the channel bed is comprised of primarily coarse material such as gravels and cobbles with sandy/silty banks.

Watercourse stability was assessed during the Albion STS MCEA using a Rapid Geomorphic Assessment (RGA), which aims to characterize components of channel adjustment and assign a stability score based on field observations. The entire study reach for the Albion STS MCEA was classified as in adjustment, with widening and aggradation noted as the primary forms of adjustment. Indicators of planform adjustment were also noted. Given these channel adjustment indicators, it is essential that specific fluvial assessments, particularly meander beltwidth and 100-year erosion assessments need to be undertaken to support the trail design, especially for those designs where the trail is situated in the river valley corridor and when one or more pedestrian crossing are proposed.

5.2. Rate of Erosion/Deposition

The following was extracted from the Fluvial Geomorphology Report (August 26, 2014) prepared by Water's Edge Limited:

> *High width-depth ratios downstream of Highway 401 reflect tendency of channel to widen and aggrade. However, there is also a trend towards entrenchment as bankfull flows are mostly concentrated to the channel. This can be of concern due to energy being focused within the channel under high flows rather than spreading onto the floodplain and dissipating. Therefore, despite trends of adjustment indicating a lateral change in channel form, there is still a threat of vertical incision.*
>
> *Sediment supply is sourced from silty and sandy channel banks as it widens and migrates, but bed scour into till and bedrock also provides some coarse material which has deposited along medial and point bars. The particle size that becomes mobilized under bankfull flows is rather small (0.009 m) and therefore finer materials will flush out regularly.*

5.3. Flood Risk in Ecosystem

As noted in the 2008 Humber River Watershed Plan, the study area is not located in a flood vulnerable area and has been designated as Open Space and Natural Area in the Approved Official Plan Buildout. Please refer to Figure 29 in Appendix B for view of the Flood Vulnerable Areas and Roads and Figure 30 for the Approved Official Plan Built-Out. A hydraulic analysis comparing the existing condition, and post construction conditions for Concepts 1 and Concept 1A was completed as part of this Feasibility Study. This information can be seen in Table 3 in Appendix B. Please note that stations where water surface elevation increases by more than 25 cm (highlighted in pink) should be reassessed at the detailed design phase. Design changes may be required to reduce the increase of flood risk. A preferred trail alignment should be situated outside of the frequent design storm floodplain.

5.4. Fluvial Geomorphological Information Gaps

A fluvial geomorphic assessment and hydraulic analysis will be required to confirm the stability of the channel throughout the project area. This will include:

- Meander belt width assessment and forecasted channel planform changes using TRCA's Meander Belt Width Delineation Procedures to confirm that abutments are placed beyond the 50-year erosion limit
- 100-year erosion assessment should be completed using historic aerial photos for at least a 30-year interval preceding the most recent aerial/ortho-photo; the historical analyses should also determine the potential form of planform adjustment – lateral migration or downstream meander migration
- Full Crossing Analysis in accordance with TRCA's Crossing Guideline for Valley and Stream Corridors

- Hydraulic modelling to demonstrate that any of the proposed crossings do not adversely affect flooodlines upstream or downstream and estimate shear stress at the crossing locations to aid in the design of erosion protection of channel banks at crossing locations
- Analysis of frequency and extent of flooding to assess risk to public safety.

The above are necessary to determine if the sections of trail will be stable in their proposed locations or whether additional bank stabilization measures would be needed to ensure long term stability for the proposed trail infrastructure assets. Please see Section 7.1 for information that has been incorporated into the trail alignment concepts to date.

6. Forecasted Capital Works (5 to 10 year horizon)

6.1. Toronto Water

The following projects are located within the study area and are planned to be implemented within the next 5 years.

<u>Trunk Sewer, Humber River Trail from Highway 401 to Tilden Crescent</u>

- Construction of new trunk sewers, or the rehabilitation and/or replacement of an existing trunk sewer pipe to extend its service life and improve system performance. May include cleaning the interior of an existing sewer, installing a liner inside an existing pipe, sealing cracks and/or joints, etc., reconstructing or realigning an existing pipe.

Duration: 2018-2019

Impact: None anticipated, this project will be complete prior to the MCEA for this study.

<u>Trunk Sewer Humberview Crescent Area</u>

- Construction of new trunk sewers, or the rehabilitation and/or replacement of an existing trunk sewer pipe to extend its service life and improve system performance. May include cleaning the interior of an existing sewer, installing a liner inside an existing pipe, sealing cracks and/or joints, etc., reconstructing or realigning an existing pipe.

Duration: 2017 – 2018

Impact: None anticipated, this project will be complete prior to the MCEA for this study.

6.2. City of Toronto Parks, Forestry & Recreation

There are no planned capital works projects in the vicinity of Crawford-Jones Park or Mallaby/Cruickshank Park in the next 5 to 10 years.

6.3. Transportation Services

The following projects are located within the study area and are planned to be implemented within the next 5 years.

Humberview Crescent, Local Road Resurfacing

- Replacement of the entire road structure, including the asphalt and underlying support materials. Repair, improvement, or replacement of: road drainage, curbs, boulevards and sidewalks. Also, includes the replacement of the City-owned portion of substandard water service connections. The property owner is encouraged to replace the private portion of the substandard water service connection, as well.

Duration: 2023

Impact: Potential for coordination of implementation if Humberview Crescent is involved in one of the recommended trail alignment concepts.

Weston Road Sewer Replacement/Major Reconstruction

This project was scheduled to be implemented in 2017, current status unknown. Impact cannot be assessed at this time.

7. Assessment of Trail Alignment Concepts

7.1. Water Crossing Design

Water crossing locations were initially selected by the City of Toronto, and were refined by the TRCA and City of Toronto following a site walk (September 13, 2018) and draft report review meetings (February 26, 2019). Each water crossing was placed at a comparatively straight and stable section of the Humber River. Crossing locations have been chosen away from:

- alluvial fans or deltas
- braided channels
- a stream confluence
- wetlands or lakes.

Crossings have been proposed at elevations to satisfy the 50-year storm event. Crossings were also modelled to meet the 25-year storm event, and there was minimal change in the bridge span required.

The following parameters have been explored at a high level to select proposed crossing locations, but should be explored in more depth during the detailed design phase of any trail alignment concept:

- Stream channel stability and self-adjustment
- Crossing location to be confirmed at most stable sections of stream channels (absence of aggrading/degrading stream channel indicators)
- Local stream channel modifications
- Confirmation that bridge abutments are located a sufficient distance away from meanders to ensure future channel migration does not affect the structure
- Deck height should be confirmed as sufficient to prevent blockage from debris and ice (i.e. arched deck over the channel)

- Approaches should minimize fill placement in the floodplain, and where extensive grading is needed boardwalk/ramps should be used instead
- Navigation Requirements
- Future studies can be undertaken to inventory existing problems such as stream-bank erosion.

7.2. Trail Design Guidelines

TRCA's policies for Recreational Use (Section 7.4.5.1 of The Living City Policies) offers guidelines for building a network of trails to connect communities, parks and greenspace. As per section h) TRCA recommends that trail alignments are:

- Established conceptually as early in the planning and development process as possible
- Follow existing linear disturbances (where ecologically appropriate) such as existing informal trails, sanitary easements, gas pipelines, and other infrastructure, rather than through undisturbed areas
- Avoid sensitive habitats, floral and/or faunal species
- Avoid the riparian zone of watercourses
- Not increase risk to public safety from natural hazards by avoiding active erosion zones, such as outside meander bends and valley walls where banks are eroding
- Avoiding incompatible topography, so that grading or filling is avoided or minimized.

These points are explored for each trail alignment concept in Section 7.3. For any recommended trail alignment concepts, a cut vs. fill analysis is required to confirm there is no loss in floodplain riparian storage. Earthworks should be kept to a minimum in the floodplain.

Under all trail alignment concepts, the trail is proposed at the existing grade (122 metre elevation), and there will be no impact from flooding up to the 10-year event. Flood risk signage is recommended at trail heads unless a larger storm event is satisfied. Please note that the proposed trail width has been increased to accommodate The City of Toronto's Multi-Use Trail Guidelines. Trail width is to be 3.5 metres where possible, to accommodate high trail use and maintenance vehicles. In constrained or environmentally sensitive areas, the trail width can be reduced to 3.0 metres with minimum 0.3 metre offset on either side.

7.3. Trail Alignment Concepts

A high-level overview of each trail alignment concept is outlined below. To see plan and profile drawings of each concept, please refer to Appendix A.

7.3.1. Concept 1

Concept 1 begins with a 30-metre boardwalk (grade 4.7%) connecting from Crawford-Jones Memorial Park and leads to a 50-metre span pedestrian bridge across the Humber River. The trail continues for 470 metres along the west bank of the Humber River, traveling through property owned by the WGCC before meeting a second boardwalk structure. This boardwalk has a 5% gradient and is 35 metres long. The boardwalk meets an 18-metre-long bridge that crosses over the Lower Humber River tributary. Another boardwalk structure with a -2.3%

gradient continues for approximately 37 metres before the trail meets existing ground again. The trail continues along the outside meander bend of the Humber River. This confined section of the valley necessitates an armourstone retaining wall. Various configurations of the 175-metre long armourstone retaining wall are included in the typical details drawing. The final segment of the trail includes two boardwalk structures and a 50-metre span pedestrian bridge that brings trail users over to Mallaby Park on the east bank of the Humber River. The first boardwalk structure is 22 metres long with a -1.1% gradient; the second boardwalk is 39 metres long with a -2.2% gradient. The total length of trail under this concept is 1,006 metres. A summary of challenges and advantages of this concept is provided below in **Table 6**:

Table 6 Concept 1 – Challenges and Advantages

Challenges or Information Gaps	Advantages
• This concept proposes trail construction along an outside meander bend, adjacent to a steep valley wall near two inactive erosion hazard monitoring sites.	• User experience as trail users can travel between Crawford-Jones Memorial Park and Mallaby Park without exiting the valley.
• Additional bank stabilization measures may be necessary to protect the proposed trail along the outer meander of the Humber River. The requirement for this should be investigated as part of the MCEA process if this option is selected. Please note that bank stabilization pricing has not been included in any cost estimates in this Feasibility Study.	
• This concept does not avoid the riparian zone of the watercourse.	
• Maintenance of the proposed retaining walls will increase the frequency of disturbance to the environment.	
• The design of all bridges and abutments must be completed by a structural engineer, with stability analysis support confirmed by a geotechnical engineer.	
• A geotechnical investigation will be required to design the proposed retaining wall.	
• One proposed culvert (golf course pond discharge point) will need to be sized during the detailed design phase if this option is selected as the preferred alternative.	

• Presence of non-evaluated wetlands on the south bank poses a constructability challenge and potential need for increased maintenance (due to wet conditions) and does not allow for TRCA's 10 metre development setback from wetland features.	
• Most significant impact to the WGCC.	
• A barrier will need to be incorporated into the design along the trail on the west bank to prevent trail users from entering WGCC and to protect trail users from stray golf balls.	
• Requires a minimum 18 metre span bridge crossing over a tributary of the Humber River.	

As noted in Section 5.1, this section of the Humber River is in adjustment, meaning that there is an increased likelihood that the channel will need to be armoured in the future to protect the proposed trail. The challenges associated with this trail alignment concept appear to outweigh the advantage of user experience. It should be noted that there are four inactive erosion hazard sites on WGCC's property dating back to 2013. TRCA staff completed erosion hazard inspections and WGCC subsequently opted to complete their own repair works. Two of these erosion hazard sites (EMS 265 & EMS 268) are near conceptual trail alignment 1 and scored 36 and 53 out of 100 respectively. These scorings are low and indicate that at the time of inspection there was no evidence of persistent, worsening erosion or nearby infrastructure at risk. Please note that placing infrastructure in these locations would increase the scoring of these sites.

7.3.2. Concept 1A

Concept 1A begins with a 30-metre boardwalk (grade 4.7%) connecting from Crawford-Jones Memorial Park to a 50-metre span pedestrian bridge across the Humber River. The trail continues for 395 metres along the west bank of the Humber River, traveling through property owned by the WGCC. A 43-metre-long boardwalk with a 2.9% gradient is required to bring users up to the second 55 metre pedestrian bridge across the Humber River. On the east bank, a 27-metre-long boardwalk with a -3.2% gradient is proposed. The trail continues for 216 metres through the private land trust, following an existing informal footpath before meeting the existing trail in Mallaby Park. The total length of trail under this concept is 816 metres. A summary of challenges and advantages of this concept is provided below in **Table 7**:

Table 7 Concept 1A – Challenges and Advantages

Challenges or Information Gaps	Advantages
• The design of all bridges and abutments must be completed by a structural engineer, with stability analysis support confirmed by a geotechnical engineer.	• User experience, as trail users can travel between Crawford-Jones Memorial Park and Mallaby Park without exiting the valley.
• Impact to two private landowners: WGCC and private land trust.	• Reduced impact to WGCC compared to Concept 1.
• A barrier will need to be incorporated into the design along the trail on the west bank to prevent trail users from entering WGCC, and to protect trail users from stray golf balls.	• The proposed trail location avoids the steep slope on west and east banks of the Humber River.
• This concept requires removal of riparian vegetation, although a reduced amount compared to Concept 1.	• Retaining walls are not proposed under this trail alignment concept.
• The proposed boardwalk at bridge #2 may result in minor flow constriction and requires future study and analysis to quantify.	• This trail alignment concept does not propose encroachment into the Humber River.
• One proposed culvert (golf course pond discharge point) will need to be sized during the detailed design phase if this option is selected as the preferred alternative.	• This trail alignment concept avoids the non-evaluated wetland.
	• This trail alignment concept avoids the outside meander bends of the Humber River.
	• Both crossings are located at straight sections of the river likely through riffles/runs where the expected erosive forces are not as high as those through pools in meander bends.
	• This concept does not require a crossing/bridge over the tributary.

Trail Alignment Concept 1A has a better balance of challenges and advantages compared to Concept 1.

7.3.3. Concept 2

Concept 2 does not propose any bridge crossings, and instead proposes to construct the trail entirely on the east bank of the Humber River. This trail alignment begins with a 90-metre tail extension from Crawford-Jones Memorial Park. Trail users will then continue on a proposed cantilever boardwalk structure that follows the eastern valley wall of the Humber River (approximately 230 metres long). The cantilever trail is proposed over an existing TRCA-owned armourstone retaining wall. Please note that this proposed trail alignment concept will require a geotechnical investigation to confirm appropriate loading on the armourstone retaining wall and assess the stability of the eastern valley wall. The trail continues for 130 metres through Metrolinx property before meeting Weston Road. The formalized section of trail ends at this point, and trail users will then follow the existing sidewalk, turning down Humberview Crescent to meet the final segment of trail proposed through the City of Toronto's road allowance parcel. Please note that Humberview Crescent does not have sidewalks, and trail users will be required to walk on the shoulder of the road. A 140-metre-long trail is proposed through City of Toronto property. The final segment of trail is a 193-metre-long boardwalk structure (-7% gradient) that connects users down into Mallaby Park. The total length of trail under this concept is 955 metres. A summary of challenges and advantages of this concept is provided below in **Table 8**:

Table 8 Concept 2 – Challenges and Advantages

Challenges or Information Gaps	Advantages
• Construction of trail adjacent to steep slope on an outside meander bend of the east bank of the Humber River.	• No impact to the WGCC, minimal impact to the private land trust.
• Bio-engineering options for bank treatment should be investigated as part of the Feasibility Study if this option is selected.	• This trail alignment concept utilizes existing publicly owned land.
• A geotechnical investigation will be required to confirm loading on top of the existing armourstone retaining wall and stability of the east valley slope under proposed conditions.	
• Maintenance and/or reconfiguration of the existing armourstone retaining walls may be required.	
• Steep gradient on the east bank necessitates use of a cantilever trail which will require maintenance.	
• Trail users are required to travel along a narrow section of sidewalk along Weston Road and down Humberview Crescent, which does not contain sidewalks.	

• Ramp connecting the trail down into Mallaby Park is quite steep (- 7% gradient) and has a maximum elevation of 9 metres above the existing ground.	
• Requires acquisition of Metrolinx property or negotiation of an easement or license agreement.	

The major challenge with this concept is the steep gradient on the east bank, and requirement for a geotechnical investigation to confirm upper slope stability under existing and proposed conditions. The steep gradient also limits the trail's connectivity down into the valley. Maintaining the trail on City-owned property requires a boardwalk structure 9 metres above existing ground and a -7% gradient.

7.3.4. Concept 3

This trail alignment concept makes use of existing street routes and brings trail users out of Crawford-Jones Memorial Park along Fairglen Crescent (230 metres) and down Weston Road (250 metres) before traveling 140 metres along Humberview Crescent. This concept proposes the construction of a 140-metre-long trail behind Humberview Crescent, on City of Toronto owned property. This section of the trail is bounded by two armourstone retaining walls due to the steep gradient in this area. The final 50-metre segment of the trail has a 2H:1V side slope. The total length of trail under this concept is 221 metres, not including street routes. A summary of challenges and advantages of this concept is provided below in **Table 9**:

Table 9 Concept 3 – Challenges and Advantages

Challenges or Information Gaps	Advantages
• Absence of sidewalks on Humberview Crescent and Fairglen Crescent (Figure 4).	• Smallest disturbance from an ecological perspective.
• This concept requires trail users to exit the valley to travel between Crawford-Jones Memorial Park and Mallaby Park.	• No impact to the WGCC.
• Maintenance of the proposed retaining walls will increase the frequency of disturbance to the environment.	• This concept is proposed on City of Toronto property and does not require engagement with private land owners.
• A geotechnical/structural engineering support will be required to design the proposed retaining wall.	• This concept is proposed outside of the regulatory floodline.
• Portions of the trail proposing a buttress of 2H:1V, toe erosion is required to be considered and the buttress to be properly keyed to the bank/slope.	

The major advantage of this concept is the potential low cost of implementation and minimal environmental disturbance. The largest drawback is user experience, although this concept is an improvement over the existing conditions. A preliminary, high-level assessment was completed to explore alternate street routes in the study area that may be more suitable for cyclists and pedestrians. There does not appear to be space in the Weston Road right-of-way to facilitate construction of a trail.

7.3.5. Existing Conditions – Do Nothing

The final concept is the 'do nothing approach' which requires trail users to use Fairglen Crescent for 230 metres and Weston Road for 310 metres to connect to the existing path and staircase at Mallaby Park. This concept requires trail users to exit the valley to travel between Crawford-Jones Memorial Park and Mallaby Park.

8. Constructability and Cost Estimate Breakdown

8.1. Cost Estimate Breakdown

The following cost estimates are for high-level estimating purposes only. Many assumptions and generalizations have been made, since detailed designs have not been created for the trail alignment concepts. These cost estimates do not contain any overhead for project management staff time, and only include the cost of construction services time and materials. Inflation factors should be added to all costs to account for elapsed time since estimate preparation in 2019.

Please note that the cost of tree removals and compensation plantings have not been included in these cost estimates. TRCA does not have basal area information which is required to estimate the area of trees to be removed under each concept. Considering the information available, the concepts have been ranked from highest to lowest ecological disturbance (and would therefore have the highest tree removal and compensation cost): Concept 1, Concept 1A, Concept 2, Concept 3.

A summary of construction estimates is provided below in **Table 10**. Please note that these high-level estimates and can vary +/- 40%.

Table 10 Preliminary Cost Estimates

Trail Alignment Concept	Cost Estimate
Concept 1	$ 3,400,000.00
Concept 1A	$ 2,800,000.00
Concept 2	$ 3,500,000.00
Concept 3	$ 1,600,000.00

These estimates should be updated during the detailed design phase. The difference in cost of each concept is largely driven by footprint size, type of equipment required, and ease of construction access. A high-level constructability assessment is provided below:

8.2. Constructability

A high-level constructability assessment was completed for each proposed trail alignment concept. This assessment considers the following parameters:

- Equipment type: Requirement for specialized equipment that may be more difficult or very costly to source
- Material type: costly or difficult to source
- Specialized knowledge or consultation required to inform the design of the trail as proposed
- Impact to existing infrastructure including private property and municipal infrastructure.

The constructability of each proposed trail alignment concept is outlined below:

- Concept 1 has the largest footprint and requires the use of temporary bridges for access. This concept also requires the use of cranes and specialized labour. This concept has moderate constructability.
- Concept 1A has similar constructability challenges to Concept 1, but a smaller overall footprint. This concept has high constructability.
- Concept 2 is of low constructability – the steep gradient on the east bank of the Humber River necessitates the use of a cantilever boardwalk and a steep boardwalk ramp.
- Concept 3 has the smallest footprint, and does not involve temporary crossings, heavy equipment such as cranes, or concrete foundations. This concept appears to have the highest constructability.

9. Selection of the Recommended Conceptual Trail Alignment(s) to be Proposed for Future MCEA

A goal of this Feasibility Study is to select recommended trail alignment concepts to be further explored under the MCEA process. Considering the summaries provided in Section 7, and cost estimate breakdown in Section 8, TRCA has compiled **Table** 11 below to summarize the assessment of each proposed concept. TRCA's 2015 Crossings Guideline for Valley and Stream Corridors offer the natural hazard and natural heritage function objectives for new crossing locations, which have been integrated into the table.

Table 11 Preliminary Conceptual Trail Alignment Assessment

Objective and Criteria	**Do Nothing**	**Concept 1**	**Concept 1A**	**Concept 2**	**Concept 3**
		West Bank Trail (3 Water Crossings)	West and East Bank Trail (2 Water Crossings)	East Bank Cantilever Trail	Surface Route
Satisfactory Water Crossing Location					
Stream Channel Stability					
Minimize the risks of damage to the crossing infrastructure from watercourse channel migration, erosion and scour through proper crossing siting and design			Crossing away from outside meander bend	Does not meet	
Avoid the need for future channel realignment or hardening by minimizing the probability of channel crossing with the crossing infrastructure	Meets	Does not meet		Toe already hardened	Meets
Rank	**5**	**0**	**3**	**1**	**4**
Geotechnical Hazards					
Minimize risk to crossing infrastructure by avoiding sites of active erosion and locations with risk of slope instability (I.e. over-steepened slopes and locations where the watercourse is coincident with the toe of the slope)	Meets	Does not meet	Meets	Does not meet	Meets
Ensure that the construction of the crossing does not aggravate valley slope instability	Meets	Does not meet	Meets	Does not meet	Meets

Ensure proper restoration of valley slopes where slope treatments are necessary	Meets	Does not meet	Meets	Does not meet	Meets
Rank	**5**	**0**	**3**	**0**	**4**
Physical and Natural Environment					
Flooding					
Ensure that flood risk does not increase as a result of the proposed crossing for all design storm events, up to, and including, the Regulatory event	Meets	Does not meet	Does not meet	Does not meet	Meets
Assessment of impact on surface drainage	0	0	0	0	0
Ability meet legislated criteria for conveyance considering implications on future land use planning	5	1	1	3	4
Rank	**5**	**1**	**1**	**3**	**4**
Erosion and Impacts to Water Quality					
Impacts on soils, geology, rate of erosion and water temperature	No Impact	High	Medium	Low	Low
Requirement for permanent erosion control measures	No Impact	Highest	Medium	Existing	Minimal
Rank	**5**	**1**	**4**	**2**	**3**
Terrestrial Habitat					
Impact on connectivity, diversity and sustainability	No Impact	High	Medium	High	Low
Avoid siting infrastructure in locations of existing forests, wetlands, seepage areas, and other sensitive habitats	No Impact	High	Medium	High	Medium

Minimize footprint impacts of crossings on important terrestrial features and their ecological functions through site selection and design					
Maintain terrestrial habitat and wildlife connectivity functions by avoiding priority areas or by siting and designing crossings to structurally connect habitat patches and to permit wildlife movement	No Impact	High	High - utilizes some pre-disturbed areas	High	Low
Rank	**5**	**1**	**3**	**2**	**4**
Aquatic Habitat					
Impact on connectivity, spawning and sustainability	No Impact	High	Low	Low	Low
Avoid sensitive aquatic habitat features such as critical spawning areas, important feeding or refuge areas for sensitive/locally rare/indicator species	Meets	Unknown	Meets	Meets	Meets
Avoid channel realignment, hardening or other modifications	Meets	Does not meet	Meets	Meets	Meets
Minimize footprint impacts of crossings on important aquatic features and their ecological functions (groundwater upwelling and discharge areas, maintaining natural sediment transport) through site selection and design	Meets	Does not meet	Meets	Meets	Meets

Maintain aquatic habitat and fish passage functions by avoiding the priority areas or by siting and designing crossings to permit fish passage	No Impact	Minimal	Minimal	Medium; pre-disturbed	None
Rank	**5**	**1**	**3**	**2**	**4**
Social/ Cultural Environment					
Aesthetic Value					
Impact on existing and proposed development aesthetic value	No Impact	Medium	Medium	Medium	Not enhanced
Rank	**0**	**3**	**5**	**4**	**0**
Benefit to Community					
Access to trails, enjoyment of valley	No Benefit	High	High	High	Low
Rank	**0**	**3**	**4**	**5**	**0**
Trail Accessibility					
Ease of trail use and compliance with AODA	not AODA compliant	High	High	not AODA compliant	not AODA compliant
Rank	**0**	**3**	**4**	**0**	**0**
Financial Criteria					
Capital Costs					
For detailed design, permitting and installation of the proposed concept	N/A	High	Moderate	High; significant unknown	Low
Cost to maintain the structure	Low	High	Moderate	High	Low
Rank	**0**	**2**	**3**	**1**	**4**
Constructability					
Complexity of Treatment	N/A	High	Medium	High	Low
Requirement for the specialized services to design or install unique specifications	N/A	Medium	Medium	High	Low
Difficulty of equipment access, estimated footprint of impact, and anticipated impacts to existing infrastructure	N/A	High	Medium	High	Low

Rank	**0**	**1**	**2**	**1**	**3**
Public Safety					
Potential Risks to Trail and Park Users					
Establish the requirements for crossing size while considering ingress/egress within the surrounding area in consultation with local municipal emergency managers					
***Please note that consultation with Municipal emergency response has not been completed as part of this Feasibility Study**					
Requirements for safety features to mitigate public safety risk (i.e. Fencing)	N/A	Fencing/ Cage	Fencing/ Cage	Fencing	Fencing
Rank	**0**	**2**	**2**	**3**	**4**
Combined Rank	**N/A - Baseline**	**12.5**	**30.5**	**20**	**30.5**

The results above indicate that Concept 1A and Concept 3 are the recommended trail alignment concepts. These concepts are recommended for presentation under the MCEA process for public review and comment.

During the detailed design phase, this trail arrangement should be further explored and refined considering the information gaps identified at the end of Sections 3, 4 and 5 of this report. A high-level overview of stakeholder impacts is provided below.

10. Stakeholder Impacts

10.1. Weston Golf and Country Club

Trail Alignment Concepts 1 and 1A are proposed to be constructed on WGCC property. To date, the WGCC has not been approached regarding this study. During the MCEA process, the City of Toronto should engage the WGCC to assess their interest in this project.

To construct the trail alignment concepts in their current configuration, a barrier or cage is required to protect the public from stray golf balls, and to ensure that trespassers are not able to enter the WGCC property. Traditional sports netting would likely pose a barrier for birds, a shorter fence with an arched top is likely sufficient to protect trail users. An example is shown below in **Figure 17**.

Figure 17 Example of trail fencing with arched top from Mule Hill Trail Source: Hiking San Diego County, 2018

This barrier should be explored in more detail during the detailed design phase.

10.2. Private Land Trust

Concepts 1A and Concept 3 both propose trail construction through the private land trust property. To date, the land trust has not been approached regarding this study. During the MCEA process, this private land trust should be engaged to assess their interest in this project. There may be possibility for a land swap between the land trust and the City of Toronto since the City owns the road allowance parcel adjacent to Humberview Crescent.

10.3. Metrolinx

The recommended trail alignment concepts do not propose trail construction through Metrolinx property. As noted in Appendix A, trail alignment concept 2 is proposed to be constructed through Metrolinx property. To date, Metrolinx has not been approached regarding this study. The City of Toronto should consider engaging Metrolinx to gauge their interest in participating in this project.

10.4. Ministry of the Environment Conservation and Parks

Phase 1 of the Mid Humber Gap Project required a work permit under the Public Lands Act to construct a trail on the original bed of the Humber River. Knowing this, a work permit will be required during implementation of any of the trail alignment concepts in this Feasibility Study.

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