Toronto and Region Conservation Authority

Board of Directors Meeting
Agenda

The meeting will be conducted via a video conference
Members of the public may view the livestream at the following link:
https://video.isilive.ca/trca/live.htm

November 22, 2024
9:30 A.M.

Pages

1. CALL TO ORDER

2. ACKNOWLEDGEMENT OF INDIGENOUS TERRITORY

3. DISCLOSURE OF PECUNIARY INTEREST AND THE GENERAL NATURE THEREOF

4. MINUTES OF THE TRCA BOARD OF DIRECTORS MEETING #8/24, HELD ON OCTOBER 25, 2024

   Minutes Link

5. DELEGATIONS

6. PRESENTATIONS

6.1 PORT LANDS FLOOD PROTECTION PROJECT UPDATE

Port Lands Flood Protection Project Update presented by George Zegarac, CEO, Waterfront Toronto; David Kusturin, CPO, Waterfront Toronto; and Ken Dion, Project Director, Waterfront Toronto.

7. CORRESPONDENCE

8. SECTION I - ITEMS FOR BOARD OF DIRECTORS ACTION

9.2 FINALIZING TRCA STRATEGIES AND PLANS REQUIRED BY REGULATION UNDER THE CONSERVATION AUTHORITIES ACT

To inform the Board that Toronto and Region Conservation Authority (TRCA) staff are finalizing the Strategies and Plans required of all conservation authorities by Ontario Regulation 686/21: Mandatory Programs and Services (the Regulation) under the Conservation Authorities Act by December 31, 2024, as prescribed in the Regulation.

10. MATERIAL FROM EXECUTIVE COMMITTEE MEETING

Executive Committee Minutes

10.1 SECTION I - ITEMS FOR BOARD OF DIRECTORS ACTION

10.1.1 GREENSPACE ACQUISITION PROJECT FOR 2021-2030 (2 KEVI LANE)

Acquisition of property located east of Martin Grove Road and north of Rathburn Road, municipally known as 2 Kevi Lane, in the City of Toronto under the “Greenspace Acquisition Project for 2021-2030,” Flood Plain and Conservation Component, Mimico Creek watershed.

(Link to report excluding appendices: Executive Committee RES.#B 70/24)

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10.1.2 LEASE RENEWAL AKACHI FARMS

Seek authority to renew the urban-agricultural lease with Akachi Farms on Toronto and Region Conservation Authority (TRCA)-owned land at the Kortright Centre for Conservation, located south of Major Mackenzie Drive and west of Pine Valley Drive, municipally known as 9788 Pine Valley Drive, in the City of Vaughan, Regional Municipality of York, Humber River watershed (CFN 44640).

(Link to report excluding appendices: Executive Committee RES.#B 71/24)

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10.2 SECTION II - ITEMS FOR EXECUTIVE COMMITTEE ACTION

10.3 SECTION III - ITEMS FOR THE INFORMATION OF THE BOARD

10.3.1 2024 Q3 COMMUNICATIONS, MARKETING AND EVENTS REPORT SUMMARY

Information report regarding Toronto and Region Conservation Authority (TRCA) corporate media communication activities during the third quarter of 2024 (July 1 - September 30, 2024).

(Link to report excluding appendices: Executive Committee RES.#B 72/24)

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10.4 SECTION IV - PERMITS ISSUED UNDER SECTION 28.1 OF THE CONSERVATION AUTHORITIES ACT

10.4.1 STANDARD DELEGATED PERMITS FOR RECEIPT - STAFF APPROVED AND ISSUED - NOVEMBER 8, 2024

STANDARD DELEGATED PERMITS FOR RECEIPT – STAFF APPROVED AND ISSUED (Page 47/95)

PERMISSION FOR ROUTINE INFRASTRUCTURE WORKS FOR RECEIPT – STAFF APPROVED AND ISSUED (Page 77/95)

PERMITS AFTER THE FACT / RESOLUTION OF VIOLATIONS FOR RECEIPT – STAFF APPROVED AND ISSUED (Page 90/95)

(Link to report excluding appendices: Executive Committee RES.#B 73/24)

10.5 CLOSED SESSION

10.5.1 CYBERSECURITY UPDATE - RESPONSE TO CITY OF TORONTO EXPANSION OF CISO MANDATE

Pursuant to Section C.4.(j) of the TRCA Board of Directors Administrative By-Law, a trade secret or scientific, technical, commercial, financial or labour relations information, supplied in confidence to TRCA, which, if disclosed, could reasonably be expected to prejudice significantly the competitive position or interfere significantly with the contractual or other negotiations of a person, group of persons, or organization.

RES.#B 74/24

11. CLOSED SESSION

11.1 RIZMI HOLDINGS LTD. – UPDATE ON OLT APPEALS

Pursuant to Section C.4.(e) of the TRCA Board of Directors Administrative By-Law, as the subject matter consists of litigation or potential litigation, affecting TRCA.

12. NEW BUSINESS

NEXT MEETING OF THE BOARD OF DIRECTORS AND ANNUAL GENERAL MEETING #1/25, TO BE HELD ON JANUARY 24, 2025 AT 9:30AM

John MacKenzie, Chief Executive Officer

/jh

13. ADJOURNMENT

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Linda Charlebois, Director, Corporate Services

RE: **2025 MUNICIPAL BUDGET UPDATE**

KEY ISSUE

As part of the 2025 municipal budget process, the legislation requires the Board vote on and approve the apportionment of operating expenses and capital costs owed to the TRCA among the participating municipalities.

RECOMMENDATION:

IT IS RECOMMENDED THAT the apportionment of operating expenses and capital costs among the participating municipalities, owed to TRCA, as part of the 2025 budget process, be approved.

BACKGROUND

In accordance with Regulation 402/22, Budgets and Apportionment of the Conservation Authorities' Act, the TRCA has provided the opportunity for the respective municipalities to review the draft budget approved in June 2024 and to consult with the TRCA. TRCA staff has met with municipal partners throughout the year to develop the draft budget so as to align with municipal objectives. Moreover, each municipality has been provided with thirty (30) days' notice of this meeting.

The amounts owed by each municipality are outlined in this report as well as by partner municipality in Attachment 1. Additionally, TRCA's 2025 Preliminary Budget for both Operating and Capital are attached in Attachment 2.

In relation to the Capital budget, it should be noted that TRCA conducts extensive fee for service capital project work for our municipal partners in the City of Toronto, Peel, York and Durham Regions. The funding envelopes and amounts for this work will not be fully determined in consultation with our municipal partners until later in 2024 or early 2025 prior to consideration by the Board in its 2025 budget approval meeting.

RATIONALE

Municipal Capital Levy

Regional Municipality of Durham

Durham Region budget guidelines are in line with previous years at a 2% increase to the funding envelope from the previous year. TRCA requested a 2025 funding envelope in the amount of $1,376,671, which compares to $1,271,671 in 2024. The increase reflects an 8% overall increase with a portion of the adjustment tied to cost of living (3%) and the remaining (5%) related to inflation associated with the transition of Category 1 and Category 2 projects and programs provided on behalf of or requested by the Region.

TRCA will continue to work with the Region in creating a budget that is sustainable and precise that will address the mandatory requirements to continue to deliver key services across the jurisdiction.

Regional Municipality of Peel

Annually, Peel Region guidelines provide for an approximate 3% increase to the funding envelope from the previous year. Peel Region's 2025 funding envelope is anticipated to be in the amount of $19,052,800, comparable to $19,529,800 in 2024. TRCA's preliminary budget for Peel reflects a 2.8% decrease on the base and is consistent with the 2025 targets contained in the 2024 submission. The decrease on the base is reflective of transitions of Category 1 and Category 2 and is not related to a change in service delivery standard. TRCA will attend Peel Council (November/December 2024) to deliver the budget presentation.

City of Toronto

City of Toronto guidelines for TRCA established during the 2018 – 2027 capital budget cycle provide for a 2025 capital funding envelope in the amount of $22,503,400, comparable to an approved $21,941,400 in 2024. The 2.6% increase in 2025 funding is driven by potential funding enhancements related to Scarborough Waterfront Project - West Shoreline and The Meadoway Multi-Use Trail for 2025.

Scarborough Waterfront Project – West Shoreline

In partnership with the City of Toronto, TRCA initiated a study in 2014 under the Environmental Assessment Act (the Scarborough Waterfront

Project) with a vision to create a system of greenspaces along the Lake Ontario shoreline which respect and protect the significant natural and cultural features of the Bluffs, enhance the terrestrial and aquatic habitat, and provide a safe and enjoyable waterfront experience. This component of the project focuses on access to and along the shoreline between Bluffer's Park, the existing beach environment, and Meadowcliffe (West Shoreline) along with shoreline improvements at Bluffers Park to help address erosion impacts and maintenance concerns. Detailed design work for the West Shoreline commenced in Fall 2020, and has continued through to 2024, with tender ready designs scheduled for completion in Fall 2024. Permits and approvals along with preliminary site preparations can begin in 2025 with construction estimated to start in 2026 once the Brimley Road South Multi-use Trail (funded) is complete.

The Meadoway Multi-Use Trail

The Meadoway is transforming the Gatineau Hydro Corridor in Scarborough into a vibrant 16-kilometre stretch of urban greenspace and meadow habitat. It stitches together over 15 parks and greenspaces, seven watercourses, employment centres, and transportation hubs across 34 neighbourhoods. The multi-use trail will provide a critical connection between downtown Toronto and Rouge National Urban Park. Completing this connection will increase opportunities for alternative, non-vehicular modes of transportation in southeast North York and Scarborough, helping to reduce car dependency and promoting equitable access. In addition to the revitalization of the 16 km corridor, the project seeks to build meaningful community engagement and educational opportunities that will facilitate an increased sense of community pride and ownership of this important natural connection.

Regional Municipality of York

York Region's 2025 funding envelope in the amount of $4,952,000, is comparable to $5,340,000 in 2024. The 7.3% decrease for 2025 is related to reduced cash flow requirements in the Erosion Monitoring and Maintenance Program in the Water Risk Management service area. Funding for this program was enhanced over a ten-year period beginning in 2021. TRCA met with York staff in July to review the 2025 budget and ensure alignment. TRCA is not required to attend York Council for budget deliberations this year, however, TRCA has requested to provide an update to York Council on the status of certain projects and programs in June 2025.

Municipal Operating Levy

The operating levy anticipated funding envelopes for the regional municipalities of Durham, Peel, and York are in line with the amounts proposed in the multi-year targets for TRCA, and approximate recent historical average increases. Table 1 provides the 2025 operating levy break down by partner municipality and Table 2 provides the 2025 operating levy Modified Current Value Assessment (MCVA) as provided by the Province. For the City of Toronto there is a requested increase of $660,000 beginning in 2025 related to the Port Land Management program.

Port Lands Management

TRCA will provide environmental expertise, management and coordination services to support the City in the operation and stewardship of new unique infrastructure in the Port Lands that provides long term flood protection and recreational opportunities for the City. This includes monitoring and management of elements like sediments and debris, wildlife, invasive species, water quality and ice.

Table 1: 2025 Operating Levy

Partner Municipality	2024 Operating Levy ($)	2025 Operating Levy ($)	2025 over 2024 Change ($)	2025 over 2024 Change (%)
Adjala-Tosorontio	1,112	1,469	357	32.10%
Durham	663,175	685,000	21,825	3.29%
Mono	1,954	1,718	(236)	-12.08%
Peel	2,167,966	2,112,219	(55,747)	-2.57%
Toronto*	11,593,600	11,935,408	341,808	2.95%
York	4,141,356	4,328,503	187,147	4.52%
TOTAL	**$18,569,163**	**$19,064,317**	**495,154**	2.67%

**Does not include request related to Port Land Management program*

Table 2: 2025 Total Operating breakdown by Modified Current Value Assessment (MCVA)

Partner Municipality	Matching Levy ($)	MCVA (%)	Matching Non-Levy ($)	Property Tax Adjustment ($)	Non-MCVA ($)	Operating Levy Total ($)	Actual Municipal (%)
Adjala-Tosorontio	32	0.01%	1,438	-	-	1,469	0.01%
Durham	11,823	2.96%	539,086	110,225	23,866	685,000	3.59%
Mono	25	0.01%	1,149	544	-	1,718	0.01%
Peel	43,381	10.85%	1,977,946	90,893	-	2,112,219	11.08%
Toronto*	256,036	64.06%	11,673,985	5,386	-	11,935,407	62.61%
York	88,395	22.12%	4,030,358	209,750	-	4,328,503	22.70%
TOTAL	**399,692**	**100.00%**	**18,223,961**	**416,798**	**23,866**	**19,064,317**	**100.00%**

**Does not include request related to Port Land Management program*

Relationship to TRCA's 2023-2034 Strategic Plan

This report supports the following Pillars and Outcomes set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 4 Service Excellence:

4.3 Responsive relationships and a trusted brand with a reputation for excellence

Pillar 4 Service Excellence:

4.4 Transparent decision making and accountable results

DETAILS OF WORK TO BE DONE

Staff will continue to work with partner municipality staff to align strategic priorities and budget to ensure the 2025 partner municipality envelopes are met. TRCA's 2025 municipal budgets are anticipated to be finalized in the fourth quarter of 2024 and first quarter of 2025 and will include municipal levy projects and programs anticipated to be approved by the respective participating municipalities.

In addition, for partner municipally supported projects, TRCA will continue to work closely with municipal staff to scope out TRCA's potential role in

the delivery of approved capital projects or projects pending decisions by senior levels of government. This includes major federally and municipally funded capital projects in the Regions of Durham, Peel, and York as well as the City of Toronto. TRCA capital budget projections may change subject to decisions related to any potential fee-for-service projects.

Staff will bring forward a detailed 2025 budget in April 2025, following all partner municipal council approvals which are anticipated to be during the first quarter 2025. As required by regulation, TRCA will provide 30 days' written notice to its partner municipalities of the date of the meeting at which the Board of Directors will approve the final budget.

Report prepared by: Jenifer Moravek, Senior Manager Strategic Business Planning & Performance
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Email: linda.charlebois@trca.ca
Date: October 11, 2024

Attachment 1: 2025 Municipal Levy
Attachment 2: TRCA 2025 Preliminary Budget

Attachment 1: 2025 Municipal Levy

	TRCA Service Areas	Adjala-Tosorontio	Durham	Mono	Peel	Toronto	York	Total
1	Watershed Studies and Strategies Total	-	101,000	-	1,428,000	279,000	233,000	2,041,000
2	Water Risk Management Total	-	361,000	-	2,613,000	10,679,000	1,669,000	15,322,00
3	Regional Biodiversity Total	-	587,000	-	4,850,000	1,727,600	1,133,000	8,297,600
4	Greenspace Securement and Management To	-	17,900	-	1,744,900	64,100	180,100	2,007,000
5	Tourism and Recreation Total	-	101,000	-	1,090,000	5,921,000	269,000	7,381,000
6	Planning and Development Total	-	14,600	-	54,300	320,400	110,700	500,000
7	Education and Outreach Total	-		-	2,003,000	189,000	201,000	2,393,000
8	Sustainable Communities Total	-	108,000	-	3,187,000	1,400,000	398,000	5,093,000
9	Corporate Services Total	-	86,171	-	2,082,600	1,923,300	758,200	4,850,271
	Total Capital	**-**	**1,376,671**	**-**	**19,052,800**	**22,503,400**	**4,952,000**	**47,884,871**
	Total Operating	**1,469**	**685,000**	**1,718**	**2,112,219**	**12,595,408**	**4,328,503**	**19,724,317**
	TOTAL	**1,469**	**2,061,671**	**1,718**	**21,165,019**	**35,098,808**	**9,280,503**	**67,609,188**

TRCA's 2025 Preliminary Operating Budget

	Expenditures	Authority Generated	Government Funded	Levies	Reserves	Net
Watershed Studies and Strategies						
Watershed Planning and Reporting	336,000	-	-	336,000	-	-
Climate Science	-	-	-	-	-	-
Water Risk Management						
Water Resource Science	-	-	-	-	-	-
Erosion Management	182,000	-	50,000	132,000	-	-
Flood Management	1,933,000	-	305,000	1,628,000	-	-
Regional Biodiveristy						
Biodiversity Monitoring	-	-	-	-	-	-
Ecosystem Management Research and Directions	-	-	-	-	-	-
Forest Management	136,000	-	-	136,000	-	-
Restoration and Regeneration	745,000	720,000	25,000	-	-	-
Greenspace Securement and Management						
Greenspace Securement	-	-	-	-	-	-
Greenspace Management	912,000	300,000	-	612,000	-	-
Rental Properties	1,168,000	1,970,000	-	-	-	802,000
Tourism and Recreation						
Waterfront Parks	-	-	-	-	-	-
Conservation Parks	7,145,000	6,145,000	175,000	1,040,000	-	215,000
Trails	-	-	-	-	-	-
Bathurst Glen Golf Course	1,615,000	1,571,000	-	-	- -	44,000
Black Creek Pioneer Village	3,751,000	1,450,000	220,000	720,000	- -	1,361,000

TRCA's 2025 Preliminary Operating Budget

	Expenditures	Authority Generated	Government Funded	Levies	Reserves	Net
Events and Festivals	472,000	1,188,000	-	-	-	716,000
Planning and Development Review						
Development Planning and Regulation Permitting	9,478,500	8,851,500	-	999,000	-	372,000
Environmental Assessment Planning and Permitting	6,229,000	3,442,000	2,327,000	496,000	-	36,000
Policy Development and Review	796,000	-	-	388,000	-	- 408,000
Education and Outreach						
School Programs	6,902,000	5,247,000	225,000	780,000	-	- 650,000
Newcomer Services	1,258,000	8,000	1,250,000	-	-	-
Family and Community Programs	1,287,000	673,000	160,000	-	-	- 454,000
Sustainable Communities						
Living City Transition Program	-	-	-	-	-	-
Community Engagement	150,000	150,000	-	-	-	-
Social Enterprise Development	-	-	-	-	-	-
Corporate Services						
Financial Management	4,496,000	1,925,000	50,000	2,373,317	-	- 147,683
Corporate Management and Governance	6,177,000	218,500	-	3,040,000	-	- 2,918,500
Human Resources	2,348,000	-	-	2,541,000	-	193,000
Corporate Communications	1,523,000	40,000	-	1,483,000	-	-
Information Infrastructure and Management	3,227,000	-	-	3,020,000	-	- 207,000
Project Recoveries	- 2,311,183	-	-	-	-	2,311,183
Vehicles and Equipment	- 1,545,000	-	-	-	-	1,545,000
Grand Total	**58,410,317**	**33,899,000**	**4,787,000**	**19,724,317**		**-**

TRCA's 2025 Preliminary Capital Budget

	Expenditures	Authority Generated	Government Funded	Levies	Reserves	Net
Watershed Studies and Strategies						
Watershed Planning and Reporting	1,166,000	-	476,000	**690,000**	-	-
Climate Science	1,351,000	-	-	**1,351,000**	-	-
Water Risk Management						
Water Resource Science	4,147,000	197,000	2,355,000	**1,595,000**	-	-
Erosion Management	39,147,000	2,035,000	25,100,000	**12,012,000**	-	-
Flood Management	2,643,300	80,000	848,300	**1,715,000**	-	-
Regional Biodiversity						
Biodiversity Monitoring	2,225,000	740,000	160,000	**1,325,000**	-	-
Ecosystem Management Research and Directions	6,651,000	2,420,000	3,154,000	**1,077,000**	-	-
Forest Management	1,198,000	-	45,000	**1,153,000**	-	-
Restoration and Regeneration	12,836,100	4,459,000	3,634,500	**4,742,600**	-	-
Greenspace Securement and Management						
Greenspace Securement	1,615,000	1,515,000	-	**100,000**	-	-
Greenspace Management	7,907,000	1,052,000	4,948,000	**1,907,000**	-	-
Tourism and Recreation						
Waterfront Parks	8,554,000	-	3,990,000	**4,564,000**	-	-
Conservation Parks	94,000	-	-	**94,000**	-	-
Trails	3,077,000	-	725,000	**2,352,000**	-	-
Black Creek Pioneer Village	371,000	-	-	**371,000**	-	-
Events and Festivals	-	-	-	-	-	-
Development Planning and Review						
Environmental Assessment Planning and Permitting	520,000	-	520,000	-	-	-
Policy Development and Review	500,000	-	-	**500,000**	-	-

TRCA's 2025 Preliminary Capital Budget

	Expenditures	Authority Generated	Government Funded	Levies	Reserves	Net
Education and Outreach						
School Programs	1,683,000	-	-	**1,683,000**	-	-
Newcomer Services	168,000	-	-	**168,000**	-	-
Family and Community Programs	542,000	-	-	**542,000**	-	-
Sustainable Communities						
Living City Transition Program	3,724,000	750,000	405,000	**2,569,000**	-	-
Community Engagement	2,524,000	-	-	**2,524,000**	-	-
Corporate Services						
Financial Management	152,200	-	-	**152,200**	-	-
Corporate Management and Governance	6,798,071	-	-	**4,198,071**	2,600,000	-
Human Resources	-	-	-	**-**	-	-
Corporate Communications	-	-	-	**-**	-	-
Information Infrastructure and Management	500,000	-	-	**500,000**	-	-
Project Recoveries	-	-	-	-	-	-
Vehicles and Equipment	-	-	-	-	-	-
Grand Total	**110,093,671**	**13,248,000**	**46,360,800**	**47,884,871**	**2,600,000**	**-**

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Sameer Dhalla, Director, Development and Engineering Services

RE: **APPLICATIONS FOR PERMITS PURSUANT TO SECTION 28.1.2 OF THE CONSERVATION AUTHORITIES ACT (MINISTER'S ZONING ORDER, ONTARIO REGULATION 483/22)**
PER-DPP-2024-00397, 0 and 12245 Torbram Road, Caledon, Ontario (Part of Lots 17-20, Concession 6, Town of Caledon, Regional Municipality of Peel) by Rice Group.

KEY ISSUE

Issuance of permit pursuant to Section 28.1.2 of the Conservation Authorities Act for lands subject to a Minister's Zoning Order (MZO) under the Planning Act to undertake alterations within a Toronto and Region Conservation Authority (TRCA) Regulated Area to facilitate topsoil stripping associated with a future industrial development at 12245 Torbram Road, Town of Caledon, Region of Peel.

RECOMMENDATION:

WHEREAS the Minister of Municipal Affairs and Housing (MMAH) issued an MZO for the subject property on September 9, 2022, as Ontario Regulation 483/22;

WHEREAS Section 28.1.2 of the Conservation Authorities Act requires TRCA to issue a permit for a development project that has been authorized by an MZO issued under the Planning Act, and where the lands in question are not located within a Greenbelt Area as identified through Section 2 of the Greenbelt Act;

WHEREAS Section 28.1.2(6), of the Conservation Authorities Act, allows TRCA to attach conditions to the permit, including conditions to mitigate any effects the development may have on the control of flooding, erosion, dynamic beaches, or unstable soil or bedrock and/or in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property;

WHEREAS Section 28.1.2(17), of the Conservation Authorities Act, provides that where a permit is to be issued, the applicant is required to enter into an agreement with TRCA;

AND WHEREAS Section 28.1.2(18), of the Conservation Authorities Act, provides that the agreement shall set out actions or requirements that the holder of the permission must complete or satisfy to compensate for ecological impacts and any other impacts that may result from the development project;

AND WHEREAS, in the absence of an approved MZO, TRCA would normally issue a permit for the construction of an industrial plan of subdivision, if it has been demonstrated there will be no impact on the control of flooding, erosion, dynamic beaches, and unstable soils or bedrock, or jeopardize the health or safety of persons or result in the damage or destruction of property;

THEREFORE, LET IT BE RESOLVED THAT Rice Group, in the Town of Caledon be issued a permit to strip topsoil in advance of a future industrial development at 12245 Torbram Road, Town of Caledon, Region of Peel;

THAT TRCA staff seek full cost recovery in accordance with TRCA's Administrative Fee Schedule; and

AND FURTHER THAT the required agreement reflect and secure the approved conditions, and any actions or requirements that the permit holder must complete or satisfy to compensate for ecological impacts and any other impacts that may result from the development project.

BACKGROUND

Permit Applications, Property Descriptions and Background

The owner has applied for permission pursuant to Section 28.1.2 of the Conservation Authorities Act (CA Act) to conduct the final topsoil stripping phase within TRCA's Regulated Area in advance of an industrial development at lands known municipally as 0 and 12245 Torbram Road, Caledon, Ontario (Location of Subject Lands – **Attachment 1**). The lands subject to the MZO are located East of Torbram Road, West of Airport

Road, and immediately North of Mayfield Road (MZO Map #314 - **Attachment 2***)*.

The entirety of the industrial subdivision lands is approximately 174.80 hectares. The subdivision contains the remaining portion of a tributary to the West Humber River, approximately 3.84 ha of riparian wetlands, as well as the floodplain and erosion hazards associated with the tributary, and the regulated allowance to these features (Constraints Analysis Map – **Attachment 3**).

Previous permissions have been issued by TRCA for topsoil stripping on the property, which resulted in the removal of regulated features. The first permit was approved on June 23, 2023 (CFN 68146 - RES.#A 112/23) and a second permit approved on May 10, 2024 (CFN 70685 - RES.#B 37/24). The subject application is for the final topsoil stripping stage within areas regulated by TRCA and involves the removal of two online ponds and the remaining portions of the tributary and riparian wetlands.

TRCA staff confirmed the limits of the slopes, wetlands and the dripline of contiguous valley and stream corridor vegetation with the applicant's consultants in 2021. Applications for an Official Plan Amendment, Draft Plan of Subdivision and Zoning Bylaw Amendment were deemed complete by the Town of Caledon in September 2021 and circulated to TRCA staff for review. A Comprehensive Environmental Impact Study and Management Plan (CEISMP), a similar study to a Master Environmental Servicing Plan (MESP), was submitted with the applications to characterize the features on site and conduct the typical impact analyses and mitigation proposed to minimize impacts.

A Minister's Zoning Order (Ontario Regulation 483/22) was issued on September 9, 2022, to convert the zoning on the property from agricultural to prestige industrial to permit a warehouse distribution centre and prestige industrial uses on the subject land holdings. The MZO did not protect the existing natural hazards and regulated features in a suitable Environmental Policy Area (EPA). The lands subject to the MZO abut lands within the Greenbelt Plan area to the southwest. The lands within the Greenbelt contain a larger valley corridor of the West Humber River and do not form part of the MZO.

The 2021 Draft Plan of Subdivision application proposes the creation of 7 industrial blocks, 3 environmental protection area blocks, 2 stormwater management blocks, and internal public streets. In total, the development is planned to include 8 industrial, warehouse and distribution buildings, with a total area of approximately 555,268 m^2 (5,976,855 ft^2). Several application submissions with supporting technical work have been reviewed by TRCA staff culminating with TRCA staff supporting approval of the latest submission on July 23, 2024, subject to several recommended conditions (Draft Plan of Subdivision Map - **Attachment 4**). Blocks 12 and 13 within the proposed plan of subdivision contain the regulated hazards associated with this permit application.

After extensive collaboration with the Town, Region of Peel, and applicant, a compensation block containing a restored natural heritage system is proposed on the subdivision lands to not only replicate the loss of features associated with this application and the overall subdivision plan, but to also provide an enhancement to the system, which has been historically altered on the lands. The final configuration of the block has been determined and it will be 8.54 hectares in size (Block 12 EPA Concept Restoration Design - **Attachment 5)**. A total of 4.47 hectares of non-Provincially Significant Wetland (PSW) will be removed within the overall subdivision. TRCA Planning Ecology staff have indicated that the compensation block would provide sufficient compensation for the removal of the features on site. The proposed compensation is discussed in detail under the rationale section in this report.

The 8.54-hectare compensation block proposed for compensation addresses the requirement for ecological compensation under the CA Act s.28.1.2 (18). Conditions have been proposed with this application to ensure that the compensation block is implemented. Additional mechanisms to ensure the block's implementation will be included in the anticipated approval of the Draft Plan of Subdivision and eventual subdivision agreement. The applicant has agreed to the additional TRCA permit conditions related to the compensation block.

Mandatory Permits for MZO Development Projects
Section 28.1.2 of the CA Act applies to a development project that has been authorized by an MZO under the Planning Act, within an area regulated under the CA Act, outside of the Greenbelt Area. The provisions of Section 28.1.2m of the Act are summarized as follows:

- The CA shall issue a permit;
- CAs may only impose conditions to the permit, including conditions to mitigate:
    - Any effects the development project is likely to have on the control of flooding, erosion, dynamic beaches or unstable soil or bedrock;
    - Any conditions or circumstances created by the development project that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property; or
    - Any other matters that may be prescribed by the regulation.
- An applicant has the right to a Hearing if there is an objection to the permit conditions being imposed by the CA. No hearing was requested for this permit application and the applicant has confirmed their consent to the conditions;
- If the applicant objects to conditions following a decision of the Hearing Board, the applicant has the option to either request a Minister's review (MNR) or appeal to the OLT;
- All MZO-related CA permits must have an agreement with the permittee (and include additional parties, e.g., municipalities, on consent of applicant);
- The agreement shall set out actions that the holder of the permission must complete or satisfy to compensate for ecological impacts, and any other impacts that may result form the development project; and
- The agreement must be executed before work commences on the site; it is an offence to commence the works without a signed agreement.

In summary, TRCA must issue a permit for development projects on lands subject to a MZO, outside of the Greenbelt, and can make that permission subject to conditions and must enter into an agreement with the landowner/applicant. Consistent with current practice, Board/Executive Committee approval is required for all TRCA MZO permit applications.

RATIONALE

Review of Permit Application by TRCA Staff

The application has been reviewed by TRCA's technical staff. The proposed site alteration does not impact:

- the control of flooding – portions of the lands are within the floodplain

associated with the tributary to be removed on site; impacts are not anticipated up and downstream of the site; temporary sediment ponds have been sized to accommodate flood flows in the construction phase and flood storage will be replicated within the compensation block;

- erosion – no erosion concerns are anticipated, and the proposed watercourses have been designed to accommodate flows from the site to mitigate any potential for bed scour or bank erosion;
- dynamic beaches – the lands are not located along the Lake Ontario shoreline;
- unstable soil – there are no unstable soils impacted by the proposed development;
- unstable bedrock – karst topography or other forms of unstable bedrock are not located within or immediately adjacent to the site;
- and/or in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property – the temporary culverts have been sized in accordance with TRCA's guidelines. The application does not result in development, which would render areas inaccessible during a Regulatory Storm event or as a result of natural hazards.

Under existing conditions, the remaining portion of the tributary on site flows through two online ponds (an upper pond and lower pond). Two large anthropogenic embankment dams restrict outflows from the ponds. Each online pond has a perched outlet culvert through its respective embankment dam, restricting fish passage. Flows from the lower pond pass under Mayfield Road eventually converging with the West Humber River approximately 850 metres downstream.

The remaining riparian wetlands totaling approximately 3.84 ha and the portion of the remaining tributary will be removed as a result of this application. The development associated with this application, including the removals, is proposed to occur in the Spring of 2025. The riparian wetland Ecological Land Classification (ELC) communities to be removed with this phase of construction include the following:

- Pondweed Mixed Shallow Aquatic - SAM1-4 – 0.31 ha
- Reed-canary Grass Mineral Meadow Marsh - MAM2-2 – 2.84ha
- Mineral Shallow Marsh / Shallow AquaticMAS2/SA – 0.46 ha

- Mineral Meadow Marsh - MAS2 – 0.18 ha
- Willow Mineral Thicket Swamp - SWT2-2 – 0.05 ha

The wetland communities on site were identified by GEI Consultants Inc. and the boundaries, as noted above, later confirmed by TRCA staff in 2021. GEI evaluated the wetlands and determined that the wetlands do not meet the scoring criteria to be considered PSWs under the Ontario Wetland Evaluation System (OWES). The CEISMP submitted with the noted planning applications identifies that the wetlands proposed for removal have been altered by present and historical anthropogenic land use (e.g., construction of online ponds and agricultural land practices that affect the extent and conditions of wetlands).

Compensation for the removals will occur in the proposed Block 12, which is to be designated Environmental Protection Area (EPA) through the implementing OPA providing protection of the block and compensation in perpetuity. The construction of the EPA block is proposed to occur starting in mid-2025. A total of 862 linear metres of new watercourse will be created in the proposed EPA block. Natural channel design principles have been incorporated into the proposal. Wetland removals from the earlier two phases and this phase will be replicated on site in the EPA block at a ratio of greater than 1:1. While 4.47 hectares of wetland across the entirety of the subdivision will be removed (Note: 0.63 ha of wetland removed through two previous TRCA permits), 5.01 hectares of wetland will be created within the Compensation/EPA block. The wetland communities to be created include Submerged Shallow Aquatic (SA), Mineral Shallow Marsh (MAS), and Meadow Marsh (MAM) and these communities have been proposed based on the water depths and hydrological inputs anticipated and based on the communities targeted for this planning area. The wetlands will be constructed over clay soil with an added 300mm deep layer of hydric soils to support wetland vegetation growth.

The EPA block will also include a variety of habitat types including three woodland community types over 2.96 hectares (Fresh-moist Oak-Maple – Hickory Deciduous Forest (FOD9), Fresh-Moist Sugar Maple Forest (FOD6), and Dry-Fresh Sugar Maple Forest (FOD5), 0.11 hectares of thicket (Upland Thicket, Speckled Alder Mineral Thicket Swamp (SWT2-1), and Willow Mineral Thicket Swamp (SWT2-2), and a 0.24 hectares upland meadow on one of the created side slopes. The planting densities proposed are 2,000 trees per hectare with a minimum canopy coverage of

60% and 4,444 shrubs per hectare for thickets. Turtle and amphibian overwintering habitat potential is built into the design as well.

The extent of the existing and proposed Regulatory floodplain conditions has been mapped through a hydraulic analysis completed by the applicant's engineering consultant. Floodplain storage will be replicated within the natural heritage system block. An embankment is proposed immediately north of Mayfield Road in order to passively control the increases in peak flows during a Regional Storm event that result from the proposed tableland development. The embankment would only function to hold back peak flows during a Regional Storm/Hurricane Hazel event as proposed stormwater management facilities would provide quantity controls up to a 100-year event. No long-term maintenance is anticipated to the embankment given its limited function. While the embankment serves a functional purpose by controlling peak flow increases, MNR guidance does not permit such controls to be relied upon for the establishment of flood hazard limits (i.e., the embankment cannot be used to reduce the Regional Storm peak flows for floodplain modelling purposes). Thus, the floodplain modelling, in the absence of such upstream facilities, has shown that flood waters would overtop Mayfield Road in a regulatory storm event. To avoid overtopping Mayfield Road, relief culverts are proposed adjacent to the existing Region of Peel culvert under Mayfield Road. Analysis completed by the consulting engineer demonstrates that the relief culverts would only be required once the most northerly block in the subdivision is developed and fully serviced (i.e., Block 7). A specific condition of Draft Plan approval has been recommended by TRCA staff to address the relief culvert requirement. As a result, no floodplain impacts are anticipated resulting from the proposed application or eventual industrial subdivision development.

Two hybrid wetland stormwater facilities are proposed upstream of the compensation/EPA block within a portion of what is now the upper online pond. TRCA's stormwater criteria have been met based on the latest pond designs. The stormwater facilities are slated to be constructed in 2026 once 50% of the subdivision blocks are paved and serviced.

As detailed above, the applicant has agreed to recommended conditions that secure the implementation of the proposed compensation in Block 12, which will compensate for ecological impacts in accordance with requirements under the CA Act. Staff are working with the applicant to

finalize the construction plans for the compensation area. A staff recommended condition for Board approval would require finalization of the construction plans prior to the execution of the required permit agreement. The implementation of compensation within the EPA block is also recommended TRCA condition of Draft Plan approval. The costs of implementing the compensation will be secured through the related subdivision agreement.

Policy Guidelines:
The proposed works are consistent with Section 8.4 (General Regulation Policies) and 8.5 (Valley and Stream Corridors) of the Living City Policies for Planning and Development in TRCA Watersheds.

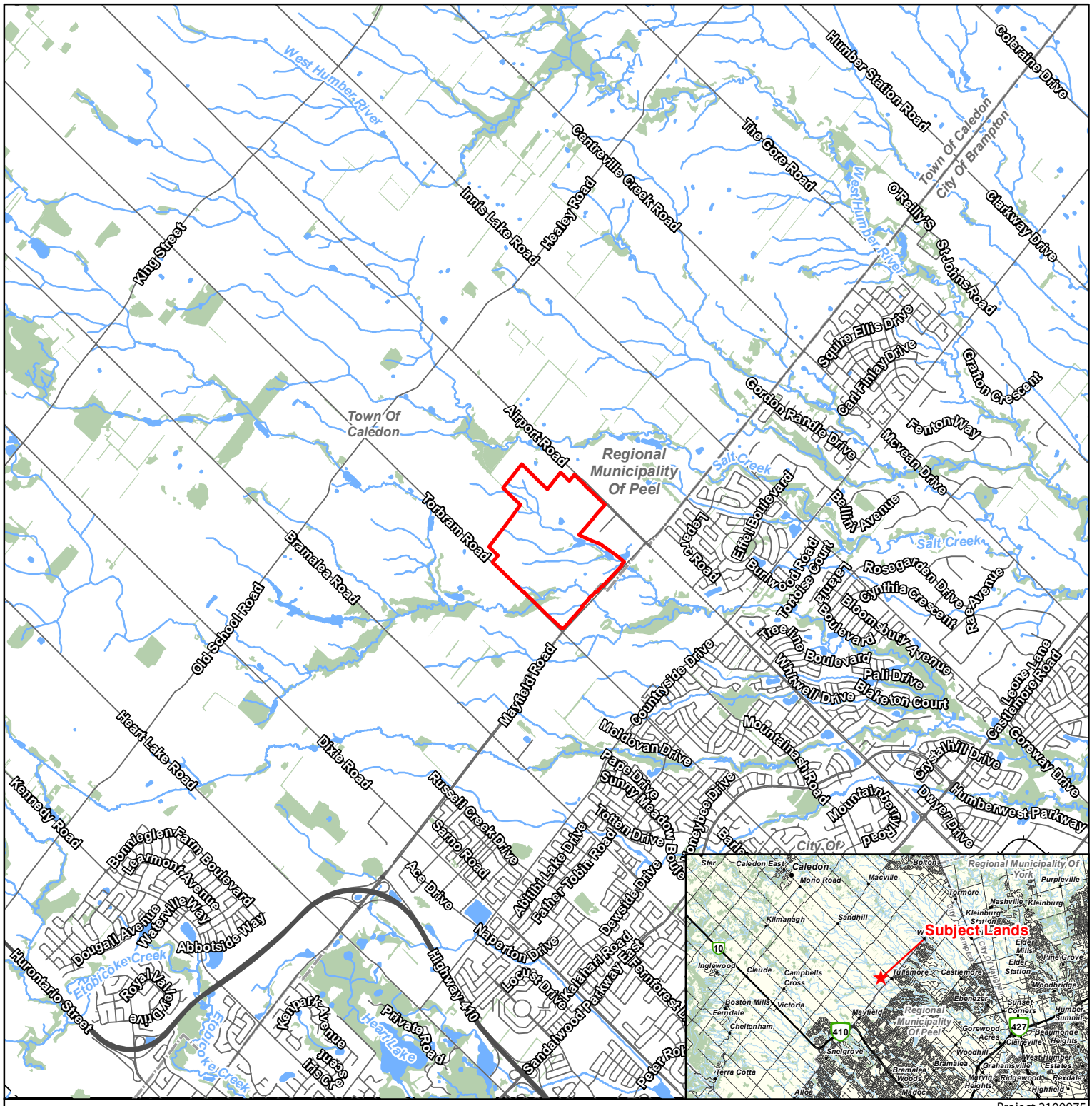
SUMMARY CONCLUSION
Approval of permission for development within the TRCA's regulated area is required to allow development to commence. Staff are recommending the approval and issuance of a permit related to this application based upon the applicant's agreement to TRCA's standard permit conditions (Standard Conditions - **Attachment 7**), and additional conditions to ensure plans are finalized prior to works initiating, to ensure related approvals are obtained, and to ensure that the features removed are replicated on site (Additional Conditions – **Attachment 8**).

Prior to the approval of the MZO, TRCA staff anticipated that alterations would be proposed, which would improve ecological function and connectivity within the natural heritage system on site. The online ponds and past agricultural activity have degraded the features on site and have contributed to thermal loading within the watercourse downstream of the ponds. The proposed compensation block and enhancements proposed will replicate the loss of features on site and will improve connectivity with the broader system. The CA Act requires TRCA to issue a permit on these lands as they are subject to a MZO, issued under the Planning Act. Staff has therefore reviewed the application and have recommended additional conditions to ensure that compensation will be implemented to mitigate ecological impacts, as prescribed in the CA Act.

Report prepared by: Jason Wagler, Senior Manager, Planning & Permits
Email: jason.wagler@trca.ca
For Information contact: Jason Wagler, (437) 880-1941

Email: jason.wagler@trca.ca
Date: October 25, 2024
Attachments: 8

Attachment 1: Location of Subject Lands
Attachment 2: Minister's Zoning Order (MZO) from Ontario Regulation 483/22 – Map 314
Attachment 3: Constraints Analysis Map
Attachment 4: Draft Plan of Subdivision Map
Attachment 5: Block 12 EPA Concept Restoration Design
Attachment 6: Proposed Works
Attachment 7: Standard Permit Conditions
Attachment 8: Additional Permit Conditions



Project 2100975

Comprehensive Environmental Impact Study and Management Plan, Tullamore Employment Lands
Tullamore Industrial LP

Figure 1
Location of Subject Lands

NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.

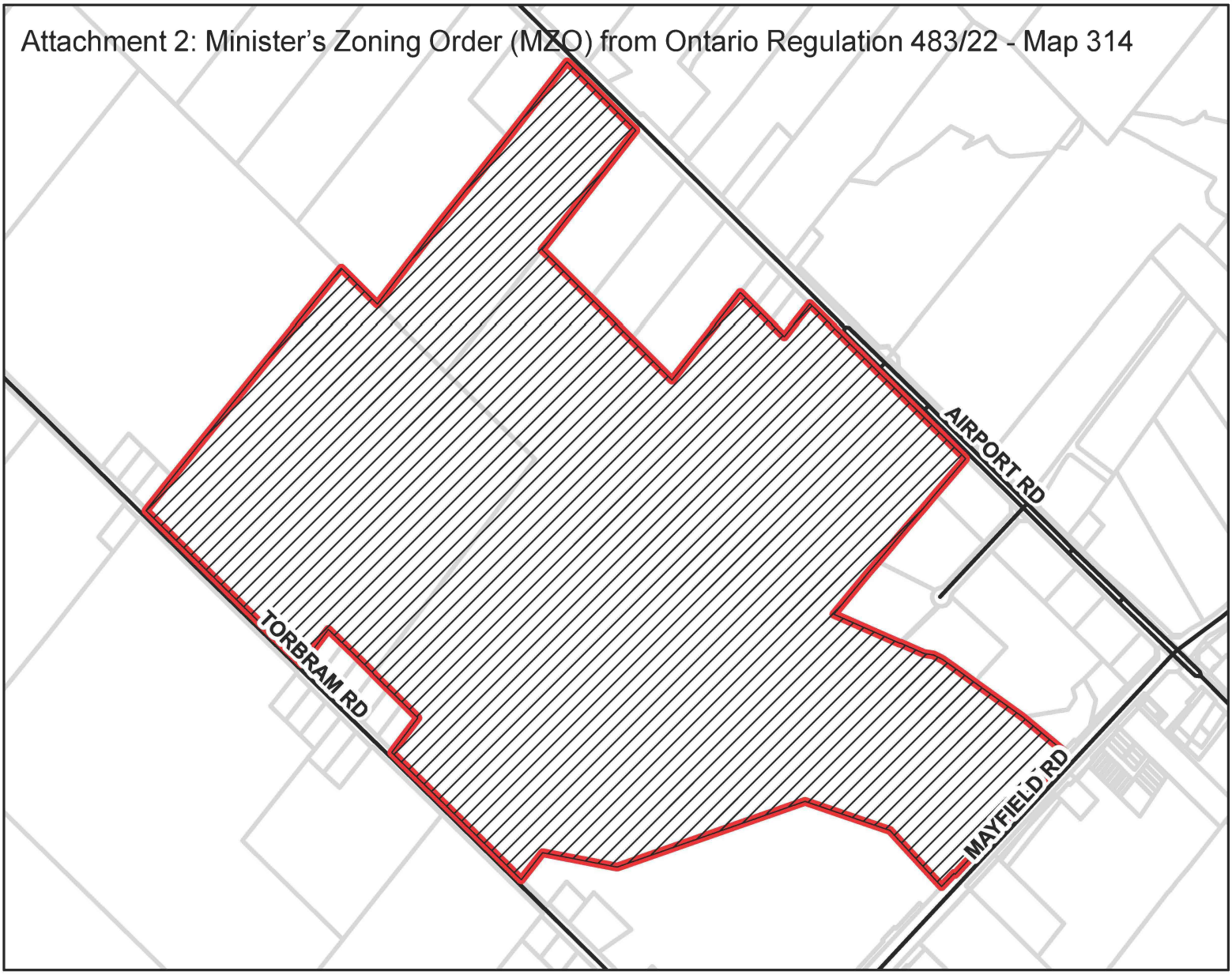
Legend
- Subject Lands
- Highway
- Road
- Railway
- Municipal Boundary, Lower/Single Tier
- Municipal Boundary, Upper Tier
- Watercourse
- Waterbody
- Wooded Area

0 500 m
1:60,000

N

GEI Consultants
Savanta Division

Part of Lots 17-20 and the Road Allowance Between Lots 17 and 18, Concession 6, East of Hurontario Street, (Chinguacousy), Town of Caledon, Regional Municipality of Peel



MAP NO. 314

Map filed at the office of the Ontario Ministry of Municipal Affairs and Housing, 777 Bay St., Toronto, Ontario,
Planning Act

Ontario Regulation: 483/22

Date: September 9, 2022

Original Signed By: Minister of Municipal Affairs and Housing

LEGEND

- Roads
- Lands Subject to Zoning Order
- Parcels
- Prestige Industrial Zone

Map North (Degrees): 0°

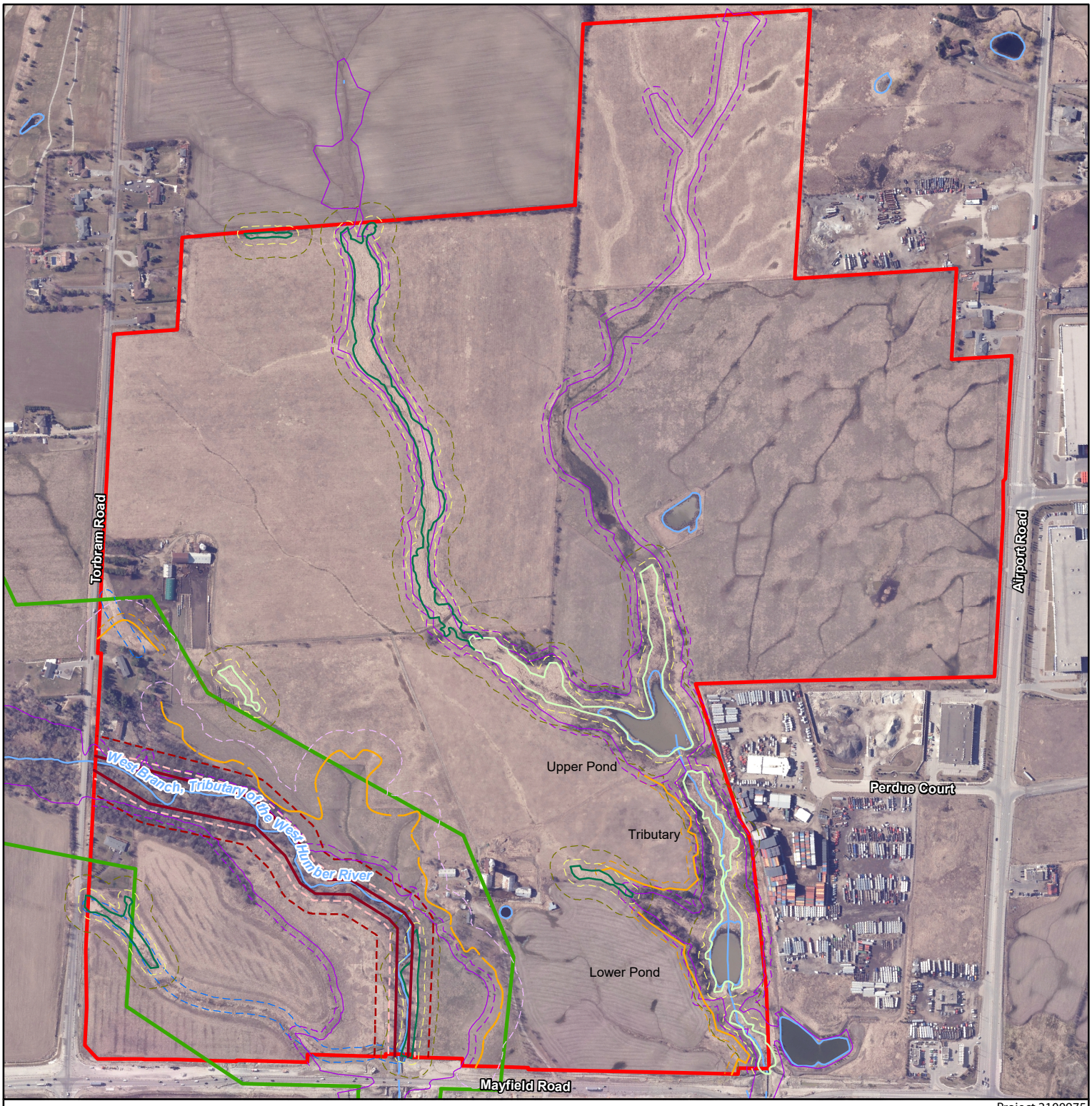
0 100 200 400
Metres

1 cm equals 130 metres

Map Description:
The map represents no. 314 referred to in a Minister's Zoning Order.
It shows lands located in, Part of Lots 17-20 and the Road Allowance Between Lots 17 and 18, Concession 6, East of Hurontario Street, (Chinguacousy), Town of Caledon, Regional Municipality of Peel. We are committed to providing accessible customer service (https://www.ontario.ca/page/accessible-customer-service-policy). On request, we can arrange for accessible formats and communications supports. Please contact MMAH by email (mininfo@ontario.ca) for regulation details.

Ontario

Attachment 3: Constraints Analysis Map



NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022; Toronto Region Conservation Authority, 2022.
3. Orthoimagery © First Base Solutions, 2021. Imagery taken in 2019.

Legend

- Subject Lands
- Watercourse (TRCA)
- Waterbody (LIO)
- Greenbelt Plan Line
- TRCA Staked Wetland
- TRCA Staked Natural Features (Top of Slope/Dripline)
- Savanta ELC Wetlands (Ground-Truthed, Not Staked)
- Regional Floodline (Croziers 2022)
- Meander Belt
- Contributing Redside Dace Habitat*
- Meander Belt +10m
- Existing Redside Dace Habitat (Meander Belt +30m)
- Regional Floodline +10m
- Staked Natural Features (Top of Slope/Dripline) +10m
- Staked Natural Features (Top of Slope/Dripline) + 30m
- Wetland +10m
- Wetland +30m

** Contributing Redside Dace Habitats would also include wetlands and their associated setbacks*

Project 2100975

Comprehensive Environmental Impact Study and Management Plan, Tullamore Employment Lands
Tullamore Industrial LP

Figure 11
Existing Ecological Constraints Analysis

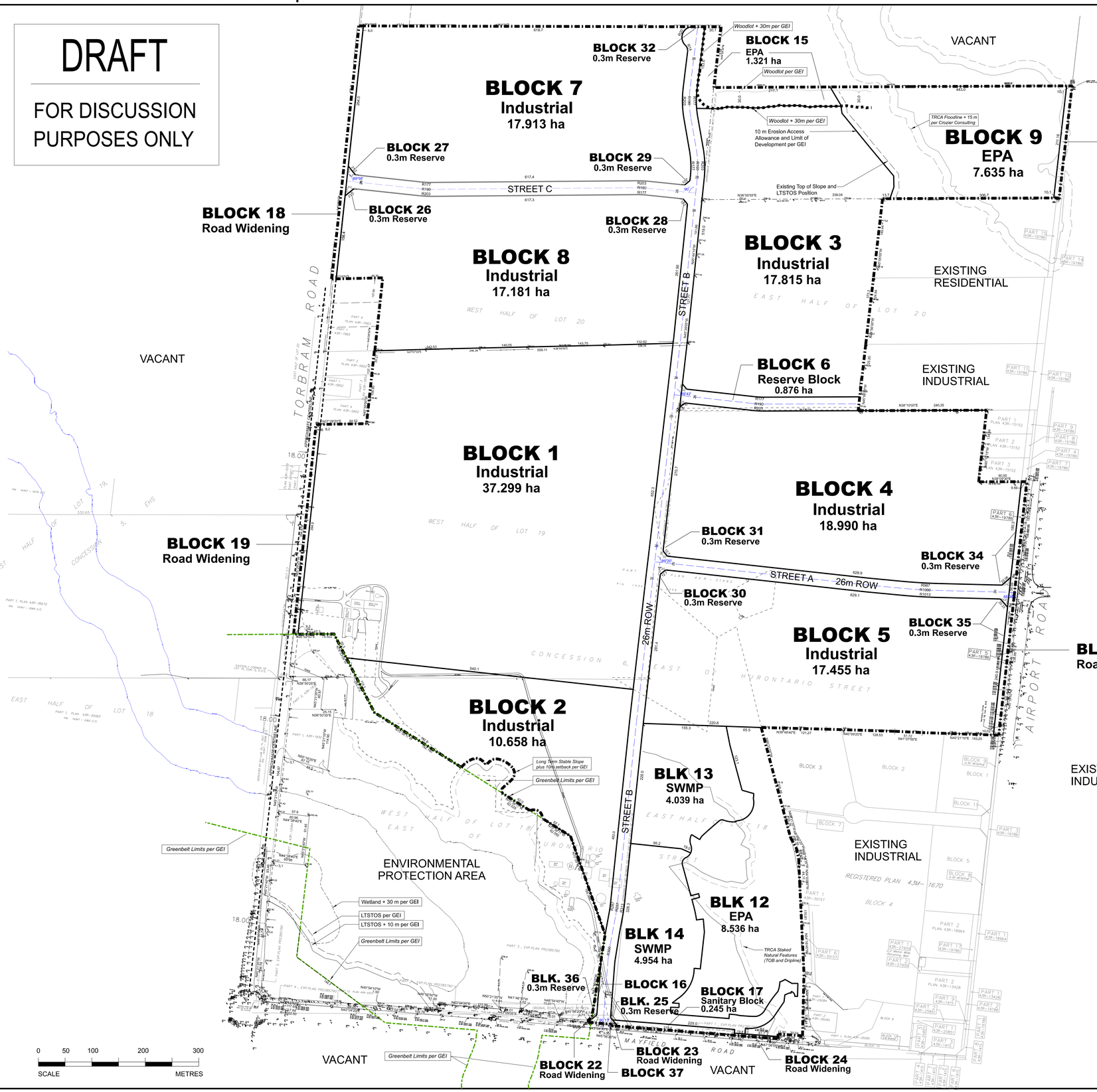
0 100 m
1:8,000

GEI Consultants
Savanta Division

Path: C:\SAVANTA\2100975 - Tullamore Emp Lands\figures\report_figures\2021 06 22 eis\2100975_rpt_fig11_Constraints Analysis.mxd Date Saved: Thursday, February 17, 2022

DRAFT

FOR DISCUSSION PURPOSES ONLY



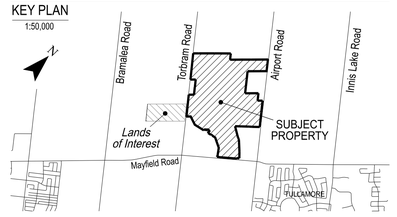
TOWN OF CALEDON
PLANNING
RECEIVED

April 24, 2024

DRAFT PLAN OF SUBDIVISION

PART OF LOTS 18, 19 AND 20, CONCESSION 6
EAST OF HURONTARIO STREET
PART OF LOTS THE ROAD ALLOWANCE
BETWEEN LOTS 17 AND 18, CONCESSION 6
EAST OF HURONTARIO STREET
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

KEY PLAN
1:50,000



OWNER'S CERTIFICATE:

I authorize Weston Consulting Group Inc. to prepare and submit this plan for draft approval.

Date: _____

Tullamore Industrial GP Limited
John McGovern, Senior Vice President, Policy and Planning
75 Tiverton Court, Markham, Ontario L3R 4M8
TEL: 905.888.1277 x 228
e: john.mcgovern@rlcgroup.ca

SURVEYOR'S CERTIFICATE:

I hereby certify that the boundaries of the lands being subdivided and their correct relationship to the adjacent lands are accurately and correctly shown on this plan.

Date: _____

Name of Surveyor, OLIP
Ontario Land Surveyor

YOUNG & YOUNG SURVEYING INC.
2 HOLLAND DRIVE, UNIT 5, BOLTON,
ONTARIO L7E 1E1
PHONE: 905.951.6000,FAX: 905.857.4811
www.youngsurveying.ca, info@youngsurveying.ca

ADDITIONAL INFORMATION:

[Section 51(17) of the Planning Act, R.S.O. 1990, c. P.13], as amended to March 24, 2024.
a), b), e), f), g), & j) - on plan.
c) - on key plan
d) - see statistics
h) - piped water to be installed by developer
i) - clay loam / loam
k) - all services to be made available by developer
l) - nil

DEVELOPMENT STATISTICS:

BLOCKS	AREA(HA)
Industrial [Block 1-5,7-8]:	137.311 ha
Reserve Block [Block 6]:	0.876 ha
Environmental Protection Area [Block 9,12,15]:	17.492 ha
SWMP [Blocks 13,14]:	8.993 ha
Block 16:	0.043 ha
Block 17 Sanitary Block:	0.245 ha
Road Widening [Block 18-24]:	1.432 ha
0.3m Reserve [Block 25-36]:	0.033 ha
Block 37:	0.005 ha
Roads:	8.373 ha
Total:	174.803 ha

WESTON CONSULTING

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T. 905.738.8080 F. 905.738.6637

Toronto: 268 Berkeley St.
Toronto, Ontario M5A 2X1
T. 416.640.9917 F. 905.738.6637

1-800.363.3558 westonconsulting.com

REVISIONS LIST

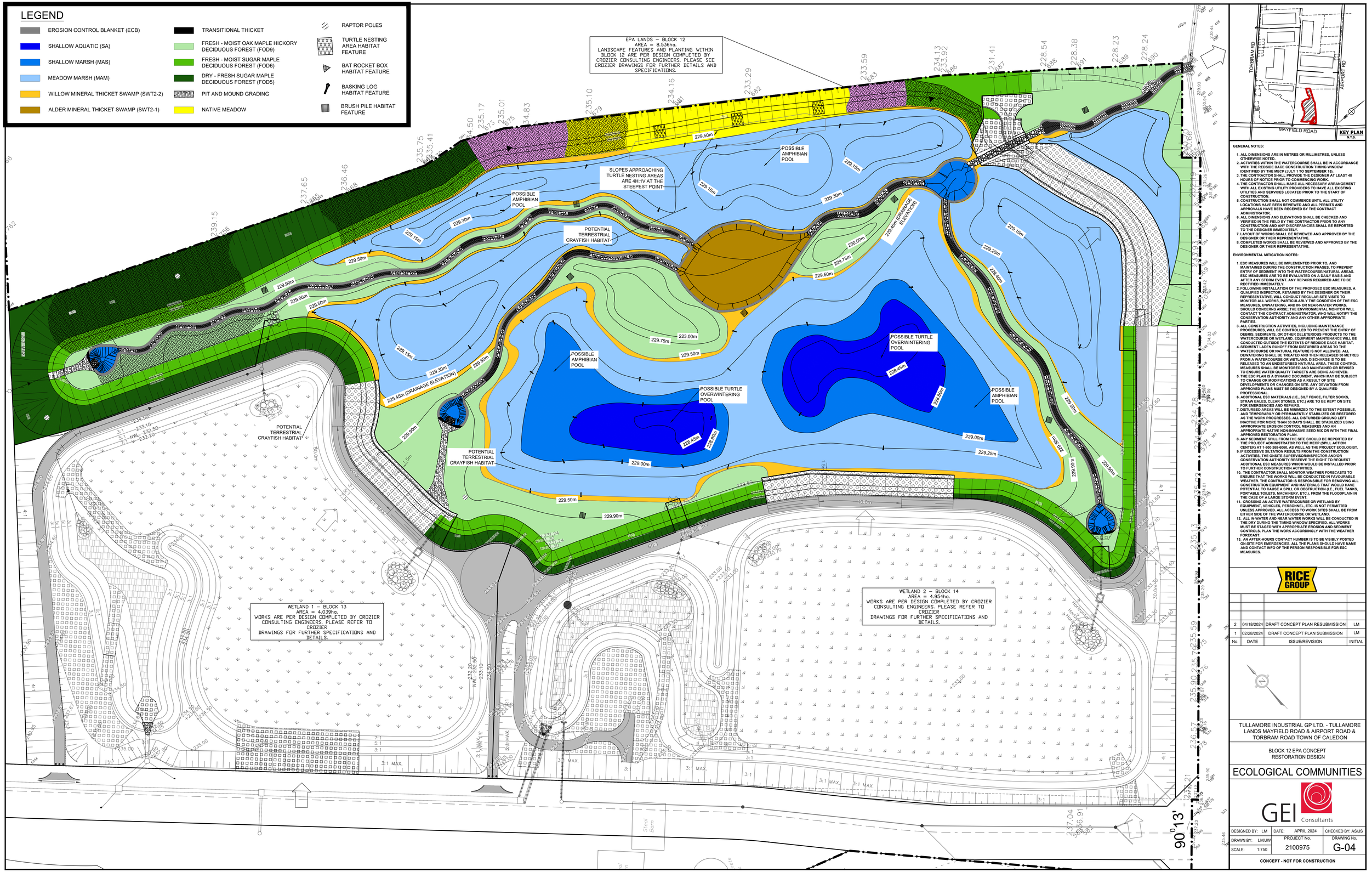
16 APR 2024	Remove Greenbelt lands & Future Community Block. Add Blk 36 reserve.
12 APR 2024	Add blocks 36-39 per GEI. Remove original Wetlands. Overlay updated GEI linework.
12-22 FEB 2024	Revise Blks 3/9 limits & Greenbelt per GEI & EPA Blk 12 & SWMP Blks 13&14 per Crozier
07-09 FEB 2024	Revise Blks 1,2, 2-14 per Crozier 2024-02-07 site plan. Digitize revised road widening
11-16 JAN 2024	Revise EPA Blk 12 & SWMP Blks 13 & 14 per Crozier. Add/remove 9m Blk 2 easement
24 OCT 2023	Revise Crest of Slope & Woodlot+setbacks per GEI Mapping & SWM-EPA-Buffer per Crozier
28 MAR 2023	Revise block limits per Site Plan. Modify Park blk to include parking area & ilink.
18 JAN 2023	Revise block limits per 2023-01-12 Site Plan & TRCA limits
16 DEC 2022	Exclude NHS Constraints. Modify Blk 4 & per Turner Fleischer 2022-12-13 Site Plan
13 DEC 2022	Revise per Crozier Street A modifications & Crest of Slope - NHS Constraints per GEI
23 NOV 2022	Adjusted Blocks per Crozier site plan & R-Plan boundaries
18 FEB 2022	Adjusted Blocks and updated TRCA survey with natural features
13-20 OCT 2021	Combine blocks 1 and 2. Adjust plan with ground topo survey
23-24 AUG 2021	Increased SWMP Revise Street A & B sight triangles

Drawing Number:

File Number:	10208
Drawn By:	SM
Planner:	DC
Scale:	1:3500
CAD:	10208/Draft plans/D13_V2_2024-04-16.dgn

D13

Attachment 5: Block 12 EPA Concept Restoration Design



GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES, UNLESS OTHERWISE NOTED.
2. ACTIVITIES WITHIN THE WATERCOURSE SHALL BE IN ACCORDANCE WITH THE REDSIDE DACE CONSTRUCTION TIMING WINDOW IDENTIFIED BY THE MECP (JULY 1 TO SEPTEMBER 15).
3. THE CONTRACTOR SHALL PROVIDE THE DESIGNER AT LEAST 48 HOURS OF NOTICE PRIOR TO COMMENCING WORK.
4. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENT WITH ALL EXISTING UTILITY PROVIDERS TO HAVE ALL EXISTING UTILITIES AND SERVICES LOCATED PRIOR TO THE START OF CONSTRUCTION.
5. CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL UTILITY LOCATIONS HAVE BEEN REVIEWED AND ALL PERMITS AND APPROVALS HAVE BEEN RECEIVED BY THE CONTRACT ADMINISTRATOR.
6. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION AND ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY.
7. LAYOUT OF WORKS SHALL BE REVIEWED AND APPROVED BY THE DESIGNER OR THEIR REPRESENTATIVE.
8. COMPLETED WORKS SHALL BE REVIEWED AND APPROVED BY THE DESIGNER OR THEIR REPRESENTATIVE.

ENVIRONMENTAL MITIGATION NOTES:

1. ESC MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATERCOURSE/NATURAL AREAS. ESC MEASURES ARE TO BE EVALUATED ON A DAILY BASIS AND AFTER ANY STORM EVENT. ANY REPAIRS REQUIRED ARE TO BE RECTIFIED IMMEDIATELY.
2. FOLLOWING INSTALLATION OF THE PROPOSED ESC MEASURES, A QUALIFIED INSPECTOR, RETAINED BY THE DESIGNER OR THEIR REPRESENTATIVE, WILL CONDUCT REGULAR SITE VISITS TO MONITOR ALL WORKS, PARTICULARLY THE CONDITION OF THE ESC MEASURES, UNWATERING, AND IN- OR NEAR-WATER WORKS. SHOULD CONCERNS ARISE; THE ENVIRONMENTAL MONITOR WILL CONTACT THE CONTRACT ADMINISTRATOR, WHO WILL NOTIFY THE CONSERVATION AUTHORITY AND ANY OTHER APPROPRIATE PARTIES.
3. ALL CONSTRUCTION ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF DEBRIS, SEDIMENTS, OR OTHER DELETERIOUS PRODUCTS TO THE WATERCOURSE OR WETLAND. EQUIPMENT MAINTENANCE WILL BE CONDUCTED OUTSIDE THE EXTENTS OF REDSIDE DACE HABITAT.
4. SEDIMENT LADEN RUNOFF FROM DISTURBED AREAS TO THE WATERCOURSE OR NATURAL FEATURE IS NOT ALLOWED. ALL DEWATERING SHALL BE TREATED AND THEN RELEASED 30 METRES FROM A WATERCOURSE OR WETLAND. DISCHARGE IS TO BE RELEASED TO AN UNDISTURBED NATURAL AREA. THESE CONTROL MEASURES SHALL BE MONITORED AND MAINTAINED OR REVISED TO ENSURE WATER QUALITY TARGETS ARE BEING ACHIEVED.
5. THE ESC PLAN IS A DYNAMIC DOCUMENT, WHICH MAY BE SUBJECT TO CHANGE OR MODIFICATIONS AS A RESULT OF SITE DEVELOPMENTS OR CHANGES ON SITE. ANY DEVIATION FROM APPROVED PLANS MUST BE DESIGNED BY A QUALIFIED PROFESSIONAL.
6. ADDITIONAL ESC MATERIALS (I.E., SILT FENCE, FILTER SOCKS, STRAW BALES, CLEAR STONES, ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES AND REPAIRS.
7. DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES. ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED USING APPROPRIATE EROSION CONTROL MEASURES AND AN APPROPRIATE NATIVE NON-INVASIVE SEED MIX OR WITH THE FINAL APPROVED RESTORATION PLAN.
8. ANY SEDIMENT SPILL FROM THE SITE SHOULD BE REPORTED BY THE PROJECT ADMINISTRATOR TO THE MECP (SPILL ACTION CENTER) AT 1-800-268-6060, AS WELL AS THE PROJECT ECOLOGIST.
9. IF EXCESSIVE SILTATION RESULTS FROM THE CONSTRUCTION ACTIVITIES, THE ONSITE SUPERVISOR/INSPECTOR AND/OR CONSERVATION AUTHORITY RESERVE THE RIGHT TO REQUEST ADDITIONAL ESC MEASURES WHICH WOULD BE INSTALLED PRIOR TO FURTHER CONSTRUCTION ACTIVITIES.
10. THE CONTRACTOR SHALL MONITOR WEATHER FORECASTS TO ENSURE THAT THE WORKS WILL BE CONDUCTED IN FAVOURABLE WEATHER. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL CONSTRUCTION EQUIPMENT AND MATERIALS THAT WOULD HAVE POTENTIAL TO CAUSE A SPILL OR OBSTRUCTION (I.E., FUEL TANKS, PORTABLE TOILETS, MACHINERY, ETC.), FROM THE FLOODPLAIN IN THE CASE OF A LARGE STORM EVENT.
11. CROSSING AN ACTIVE WATERCOURSE OR WETLAND BY EQUIPMENT, VEHICLES, PERSONNEL, ETC. IS NOT PERMITTED UNLESS APPROVED. ALL ACCESS TO WORK SITES SHALL BE FROM EITHER SIDE OF THE WATERCOURSE OR WETLAND.
12. ALL IN-WATER AND NEAR WATER WORKS WILL BE CONDUCTED IN THE DRY DURING THE TIMING WINDOW SPECIFIED. ALL WORKS MUST BE STAGED WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS. PLAN THE WORK ACCORDINGLY WITH THE WEATHER FORECAST.
13. AN AFTER-HOURS CONTACT NUMBER IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES. ALL THE PLANS SHOULD HAVE NAME AND CONTACT INFO OF THE PERSON RESPONSIBLE FOR ESC MEASURES.

RICE GROUP

No.	DATE	ISSUE/REVISION	INITIAL
2	04/18/2024	DRAFT CONCEPT PLAN RESUBMISSION	LM
1	02/28/2024	DRAFT CONCEPT PLAN SUBMISSION	LM

TULLAMORE INDUSTRIAL GP LTD. - TULLAMORE LANDS MAYFIELD ROAD & AIRPORT ROAD & TORBRAM ROAD TOWN OF CALEDON

BLOCK 12 EPA CONCEPT RESTORATION DESIGN

ECOLOGICAL COMMUNITIES

GEI Consultants

DESIGNED BY: LM	DATE: APRIL 2024	CHECKED BY: AS/JS
DRAWN BY: LM/JW	PROJECT No. 2100975	DRAWING No. G-04
SCALE: 1:750		

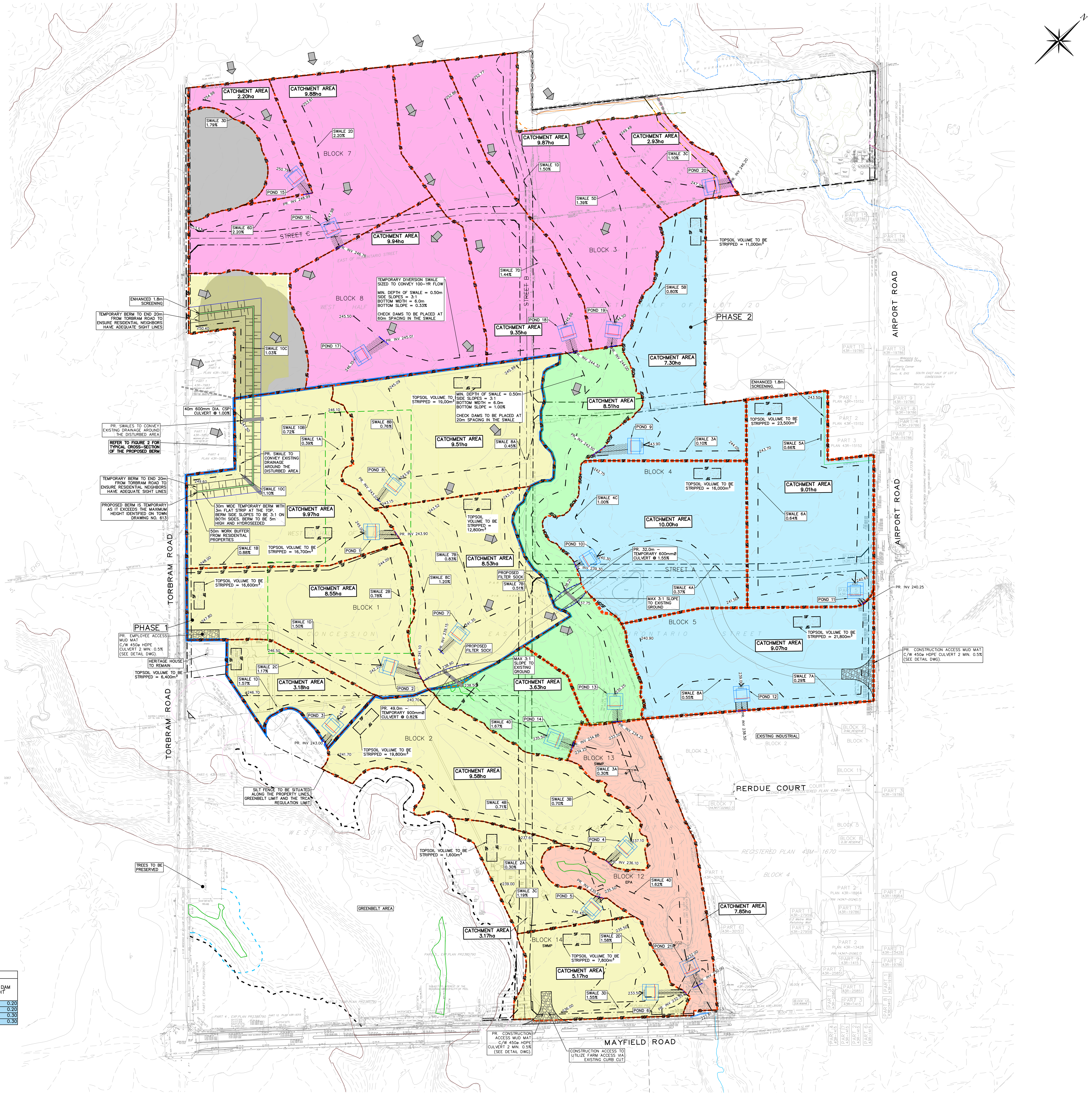
CONCEPT - NOT FOR CONSTRUCTION

B:\Working\RICE GROUP\2100975 Tullamore Employment Lands\06_FLUVIAL\CAD\Redesign\2100975 - Channel Design_Restoration - 2024.04.18.dwg - 4/18/2024

Attachment 6: Proposed Works

CONTRUCTION SEQUENCING FOR TEMPORARY CULVERTS:

1. THIS WORK IS ONLY TO BE COMPLETED DURING DRY WEATHER.
2. INSTALL TEMPORARY SILT FENCE 20m UPSTREAM AND DOWNSTREAM OF THE TEMPORARY CULVERT LOCATIONS.
3. FOR NATURALLY OCCURRING STREAM FLOWS INSTALL TEMPORARY PUMP AND HOSE TO ROUTE ANY FLOWS PAST THE CULVERT AREA. NATURALLY OCCURRING STREAM FLOWS WITHIN THE NHS SHOULD BE MAINTAINED AT ALL TIMES, INCLUDING PRIOR TO AND DURING THE PROPOSED DISTURBANCE ASSOCIATED WITH THE INSTALLATION OF THE CULVERTS/TEMPORARY CROSSING, FROM UPSTREAM OF THE PROPOSED DISTURBANCE AREA TO DOWNSTREAM OF IT. THESE FLOWS ARE CLEAN STREAM FLOWS THAT SHOULD NOT BE TREATED.
4. FOR WET WEATHER FLOWS, INSTALL TEMPORARY PUMP AND HOSE TO ROUTE ANY WET WEATHER FLOWS AND WATER ACCUMULATION WITHIN THE DISTURBANCE AREA. THE WORK AREA FLOW WOULD NEED TO BE TREATED THROUGH A TREATMENT TRAIN BEFORE BEING DISCHARGED DOWNSTREAM. DEWATERING TREATMENT TRAIN SYSTEM IS ON DRAWING TSP-02
5. INSTALL TEMPORARY CULVERT.
6. CONSTRUCT TEMPORARY ROAD ON TOP OF THE CULVERT AND ASSOCIATED MATCH 3:1 GRADING.
7. INSTALL FILTER SOCK AT BASE OF 3:1 GRADING.
8. REMOVE TEMPORARY SILT FENCE UPSTREAM AND DOWNSTREAM OF THE CULVERTS



FILTREXX SPACING CALCULATIONS					
INTERCEPTOR SWALE	LENGTH OF CHANNEL BETWEEN CHECK DAMS	SWALE SLOPE (%)	SWALE/CHANNEL SLOPE m/m	CHANGE IN ELEVATION FROM U/S TO D/S DAM	CHECK DAM HEIGHT
A	65	0.30	0.0030	0.20	0.20
B	28	0.70	0.0070	0.20	0.20
C	27	1.10	0.0110	0.30	0.30
D	20	1.50	0.0150	0.30	0.30

NOTE: REFER TO DRAWINGS TSP-02 FOR FILTREXX DETAIL

LEGEND

- PROPERTY LINE
- PROPOSED SWALE
- EXISTING CONTOUR (1.0m)
- EXISTING CONTOUR (5.0m)
- GREENBELT BOUNDARY
- CURRENT PHASE TOPSOIL STRIPPING AREA CATCHMENTS
- SILT FENCE (TOWN STD 304)
- DOUBLE SILT FENCE (PER DETAIL ON DWG TSP-02)
- WETLAND LIMIT (30m BUFFER, GEI 2022)
- WETLAND LIMIT (GEI 2022)
- EX. WATERCOURSE
- PR. SEDIMENT CURTAIN (OPSS 219.260 AND OPSD 219.261)
- FLOODLINE
- FLOODLINE + 15m BUFFER
- ENCHANCED 1.8m SCREENING
- 50m WORK BUFFER FROM RESIDENTIAL PROPERTIES
- DRIPLINE (GEI 2023)
- WOODLAND + 10m BUFFER (GEI 2023)
- PROPOSED BUILDING OUTLINE
- TOPSOIL STRIPPING - BLOCK 1 AREA
- PROPOSED SLOPE (3:1 MAX.)
- EXISTING WETLANDS (GEI 2022)
- EXISTING WOODLANDS (GEI 2022)
- EXISTING OVERLAND FLOW DIRECTION
- +235.86 BELOW PROPOSED SURFACE
- +235.86 MATCH EXISTING ELEVATION
- TEMPORARY POND WITH FOREBAY
- STOCKPILE LOCATION SURROUNDED BY SILT FENCE (OPSD-219.100)
- 200mm DEPTH, 200mm DIAMETER RIP-RAP UNDERLAID WITH GEOTEXTILE
- FIRST PHASE OF TOPSOIL STRIPPING WORKS
- SECOND PHASE OF TOPSOIL STRIPPING WORKS
- THIRD PHASE OF TOPSOIL STRIPPING WORKS
- FOURTH PHASE OF TOPSOIL STRIPPING WORKS
- FIFTH PHASE OF TOPSOIL STRIPPING WORKS
- 50m ARCHAELOGICAL BUFFER
- FILTREXX CHECK DAM

NOTE:
1. CONTRACTOR TO ENSURE POSITIVE DRAINAGE FROM EXTERNAL PROPERTIES IS MAINTAINED AND DRAINAGE FROM EXTERNAL PROPERTIES IS NOT BLOCKED
2. STOCKPILE TO BE STABILIZED USING EROSION CONTROL MATS AND TERRA SEED WITH 50mm DEPTH OF MULCH

NOTE: PLANT MATERIAL AND LEAF LITTER, EXCEPT FOR INVASIVE SPECIES, THAT ARE GENERATED BY CLEARING THE SITE, ARE TO BE CHIPPED AND REMOVED FROM THE SITE

NOTE: ANY TOPSOIL STOCKPILED FOR OVER 6 MONTHS SHOULD BE AMENDED WITH COMPOST

NOTE: STABILIZE STOCKPILE AND ANY OTHER EXPOSED SOILS ON AREAS INACTIVE FOR 30 DAYS. (REFER TO TSP-02)

NOTE: SEED MIX AND COIR MATTING WILL BE REQUIRED TO STABILIZE DISTURBED SURFACES THAT ARE LEFT EXPOSED FOR 30 DAYS OR MORE. (REFER TO TSP-02)

NOTE: TOPSOIL STOCKPILES ARE NOT TO EXCEED 3.0m IN HEIGHT, IF APPLICABLE.

NOTE: CATCHMENT AREAS & BLOCKS CAN BE PRE-GRADED AT DIFFERENT TIMES

NOTE: REFER TO DRAWINGS TSP-02 FOR POND AND SWALE DESIGN DETAILS

50 0m 50 100 150 200
SCALE: 1:2500

No.	ISSUE / REVISION	YYYY/MMM/DD
6	ISSUED TO TRCA	2024/AUG/29
5	ISSUED TO TRCA	2024/MAY/24
4	ISSUED TO TRCA	2024/APR/10
3	ISSUED TO TRCA	2023/DEC/13

Stamp | Stamp

BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVATION USING THE "TOPNET" GPS NETWORK OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (1997.0)

ELEVATION NOTE:
ELEVATIONS HERON ARE GEODETIC IN ORIGIN AND WERE DERIVED FROM GPS OBSERVATION USING THE "TOPNET" GPS NETWORK AND REFERED TO THE CGVD-1928: 1987 DATUM

SITE BENCHMARK:
A CUT CROSS HAVING ELEVATION 242.51 m WAS SET ON THE NORTHEAST CORNER OF THE INTERSECTION BETWEEN MAYFIELD ROAD AND TORBRAM ROAD

DRAFT PLAN NOTES:
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY WESTON CONSULTING INC.
DRAWING No.: TBD
PROJECT No.: TBD

DRAWING NOTES:
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.
THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.
ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project
TULLAMORE LANDS
TOWN OF CALEDON

Drawing
TOPSOIL STRIPPING BLOCK 1, PHASE 1-5 AREAS

CROZIER CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA

Drawn L.E.	Design I.C.	Project No. 2022-5842
Check I.C.	Check J.S.	Scale 1:2500 / Fig. TSP-01

Attachment 7

Standard conditions for Approval by the Board of Directors, November 22, 2024

1. The Owner shall strictly adhere to the approved TRCA permit, plans, documents and conditions, including TRCA redline revisions, herein referred to as the "works", to the satisfaction of TRCA. The Owner further acknowledges that all proposed revisions to the design of this project that impact TRCA interests must be submitted for review and approval by TRCA prior to implementation of the redesigned works.

2. The Owner shall notify TRCA Enforcement staff 48 hours prior to the commencement of any of the works referred to in this permit and within 48 hours upon completion of the works referred to herein.

3. The Owner shall grant permission for TRCA staff, agents, representatives, or other persons as may be reasonably required by TRCA, in its opinion, to enter the premises without notice at reasonable times, for the purpose of inspecting compliance with the approved works, and the Terms and Conditions of this permit, and to conduct all required discussions with the Owner, their agents, consultants or representatives with respect to the works.

4. The Owner acknowledges that this permit is non-transferrable and is issued only to the current owner of the property. The Owner further acknowledges that upon transfer of the property into different ownership, this permit shall be terminated and a new permit must be obtained from TRCA by the new owner. In the case of municipal or utility projects, where works may extend beyond lands owned or easements held by the municipality or utility provider, landowner authorization is required to the satisfaction of TRCA.

5. This permit is valid for a period of two years from the date of issue unless otherwise specified on the permit. The Owner acknowledges that it is the responsibility of the owner to ensure a valid permit is in effect at the time works are occurring; and, if it is anticipated that works will not be completed within the allotted time, the Owner shall notify TRCA at least 60 days prior to the expiration date on the permit if an extension will be requested.

6. The Owner shall ensure all excess fill (soil or otherwise) generated from the works will not be stockpiled and/or disposed of within any area regulated by TRCA (on or off-site) pursuant to Ontario Regulation 166/06, as amended, without a permit from TRCA.

7. The Owner shall install effective erosion and sediment control measures prior to the commencement of the approved works and maintain such measures in good working order throughout all phases of the works to the satisfaction of TRCA.

8. The Owner acknowledges that the erosion and sediment control strategies outlined on the approved plans are not static and that the Owner shall upgrade and amend the erosion and sediment control strategies as site conditions change to prevent sediment releases to the natural environment to the satisfaction of TRCA.

9. The Owner shall repair any breaches of the erosion and sediment control measures within 48 hours of the breach to the satisfaction of TRCA.

10. The Owner shall make every reasonable effort to minimize the amount of land disturbed during the works and shall temporarily stabilize disturbed areas within 30 days of the date the areas become inactive to the satisfaction of TRCA.

11. The Owner shall permanently stabilize all disturbed areas immediately following the completion of the works and remove/dispose of sediment controls from the site to the satisfaction of TRCA.

12. The Owner shall arrange a final site inspection of the works with TRCA Enforcement staff prior to the expiration date on the permit to ensure compliance with the terms and conditions of the permit to the satisfaction of TRCA.

13. The Owner shall pay any additional fees required by TRCA in accordance with the TRCA Administrative Fee Schedule for Permitting Services, as may be amended, within 15 days of being advised of such in writing by TRCA for staff time allocated to the project regarding issues of non-compliance and/or additional technical review, consultation and site visits beyond TRCA's standard compliance inspections.

Attachment 8

Additional Permit Conditions for Approval by the Board of Directors, November 22, 2024

Additional Conditions:

15. The Owner shall provide revised plans and drawings to the satisfaction of TRCA staff to address all outstanding TRCA technical comments prior to the commencement of any Works.

16. Prior to the execution of the Agreement, the Owner agrees to provide final Compensation Plans, detailing the ecological compensation proposed to meet the requirements of TRCA's Guideline for Determining Ecosystem Compensation.

17. As a component of the agreement the Permit Holder agrees to implement the final Compensation Plans for ecological impacts resulting from the development project to the satisfaction of TRCA staff. And that the Permit Holder agrees to provide Securities to ensure that the Compensation Plans are implemented to the satisfaction of TRCA staff.

18. Prior to the commencement of any Works, the Permit Holder shall provide a copy of any permit, license or clearance, where required, under the Endangered Species Act (ESA) from the Ministry of Environment, Conservation and Parks (MECP), under the Fish Wildlife and Conservation Act, from the Ministry of Natural Resources (MNR) and under the Fisheries Act, from Fisheries and Oceans Canada (DFO) for the Works.

19. Prior to the commencement of any Works, the Permit Holder shall obtain any required approval or clearance, where required, under the Municipal Act and Planning Act, from the Town of Caledon, for the Works.

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Sameer Dhalla, Director, Development and Engineering Services

RE: **ENDORSEMENT OF THE ETOBICOKE CREEK WATERSHED PLAN 2024-2034**

KEY ISSUE

The purpose of this report is to provide an overview of the Etobicoke Creek Watershed Plan (ECWP) and to request approval of the watershed plan by the Board of Directors.

RECOMMENDATION:

WHEREAS TRCA, its partner municipalities, Mississaugas of the Credit First Nation, and the Greater Toronto Airports Authority (GTAA) have developed the new ECWP;

WHEREAS the watershed plan outlines current and potential future watershed conditions and identifies measures to protect, enhance, and restore watershed health and build resiliency to land use and climate changes;

WHEREAS the 60-day public review period of the draft ECWP concluded on September 29, 2023;

WHEREAS the ECWP was endorsed by the City of Toronto Council on April 17, 2024, adopted by the City of Mississauga Council on April 17, 2024, endorsed by the Region of Peel Council on June 13, 2024, endorsed by the City of Brampton Council on September 11, 2024, and endorsed by the Town of Caledon Council on October 22, 2024;

IT IS RECOMMENDED THAT the overview of the ECWP be received and that the Board of Directors approve the final watershed plan;

THAT staff be directed to communicate the final approval of the ECWP to all partners and stakeholders;

AND FURTHER THAT staff be directed to establish an Implementation Steering Committee and commence work on implementing the ECWP in collaboration with the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, Mississaugas of the Credit First Nation, and the GTAA.

BACKGROUND

A watershed refers to an area that is drained by a river and its tributaries. Healthy watersheds provide numerous ecosystem services and benefits (e.g., flood and erosion protection, clean water, biodiversity, climate resiliency) as well as recreational opportunities. These services and benefits are critical to sustaining healthy and resilient ecosystems and safer communities over the long term.

The purpose of a watershed plan is to help understand current and potential future watershed conditions more comprehensively at the watershed scale. This mainly relates to natural hazards, natural heritage/urban forest, water resources, and water quality. Watershed plans also identify strategic measures and actions to protect, enhance, and restore watershed health to build safer and more resilient communities in the face of land use and climate changes. Watershed planning accounts for the integrated nature of natural systems and human systems and helps inform sustainable land use and infrastructure planning decision-making and climate adaptation planning.

Provincial policy recognizes the watershed as the most ecologically meaningful scale for integrated and long-term planning. Watershed planning is required for large and fast-growing municipalities (and encouraged for other municipalities) by Provincial plans and policies, including the Provincial Planning Statement, 2024 and Greenbelt Plan, 2017. These policies require that watershed planning be undertaken to identify and protect natural resources and areas and to protect the quantity and quality of water resources.

Watershed plans are not land use plans and do not determine land use planning decisions. However, as supported by provincial policy, the data, scientific analysis, scenario modelling, and management actions generated through a watershed planning process are used by municipalities to help inform future land use and infrastructure planning decisions.

In addition, the watershed plans can be an excellent resource for municipalities to inform various municipal initiatives to improve watershed health and create safer communities. This includes sustainability planning,

climate change adaptation, green space securement and management, and ecosystem restoration and management. These plans can also help inform best practices for rural land uses, low impact development and green infrastructure implementation, stormwater management planning and retrofit, flood and erosion remediation, and urban revitalization initiatives.

Etobicoke Creek is a heavily urbanized watershed with eight subwatersheds at the western end of TRCA's jurisdiction. The watershed is approximately 22,404 hectares in size. Its headwaters originate in the Greenbelt in the Town of Caledon, before flowing south through the City of Brampton and the City of Mississauga, and ultimately entering Lake Ontario in the City of Toronto.

The City of Toronto represents 9.2% of the watershed and the Region of Peel represents 90.8% of the watershed (32.7% in Mississauga, 33.2% in Brampton, and 24.9% in Caledon). As of 2019, 59.5% of the watershed was urban, 28.2% was rural, and 12.3% was natural. There was 47.9% impervious cover across the watershed.

One important role that the ECWP plays is to ensure that the growth decisions occurring in the upstream communities, such as those currently being planned or underway in the Headwaters of the Etobicoke Creek watershed, do not adversely affect downstream communities.

The development of the ECWP was a collaborative effort that commenced in 2020 with the formation of a Steering Committee. Members included staff from TRCA, the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, Mississaugas of the Credit First Nation, and the GTAA.

Credit Valley Conservation was engaged as the ECWP was developed to ensure consistency in watershed planning approaches between the two conservation authorities. Additional First Nations and Indigenous communities, watershed stakeholders, and public representatives were also engaged and involved throughout the watershed plan development process.

The development of the ECWP involved the following three key stages:

Stage 1 Watershed Characterization (2020-2021): provided an understanding of current watershed conditions and trends over the last 20 years, such as habitat quality and quantity, sensitive species, surface and groundwater quality and quantity conditions, and flooding and erosion issues. This stage culminated in the release of the Watershed

Characterization Report in June 2021.

Stage 2 Future Management Scenarios (2021-2022): examined different potential future land use scenarios and the impacts of climate change (where possible) to understand how watershed conditions may change over time. A Future Management Scenario Analysis Report was released in July 2022. This report contains detailed information on the various scenarios analyzed and presents the findings from extensive watershed modelling and technical analyses for each technical component. The information contained in both the Watershed Characterization and Future Management Scenario Analysis Reports was used to inform the next stage of the watershed planning process.

Stage 3 Implementation Planning (2022-2024): developed a realistic management framework consisting of three goals, eight objectives, and 36 priority management actions to protect, enhance, and restore watershed health, and led to the development of the draft ECWP document. The management framework and draft ECWP were developed with extensive input and review by TRCA's internal Technical Committee and the ECWP Steering Committee. Information on the inventory, monitoring, and evaluation required to track implementation progress and watershed conditions was also included in the watershed plan.

The draft ECWP was released in Summer 2023 for a 60-day public review period (from August 1 to September 29, 2023). TRCA, with input from the Steering Committee, has addressed the feedback received on the draft ECWP and updated the watershed plan. TRCA staff have worked closely with municipal staff to take the updated ECWP to municipal Committees and Councils for endorsement/adoption from April to October 2024 and is now requesting that TRCA's Board of Directors approve the ECWP.

RATIONALE

Etobicoke Creek Watershed Plan Overview

The ECWP (Attachment 1) is divided into nine sections. A brief summary of each section is provided below. In addition, prior to the Executive Summary, the ECWP includes a section on 'The Land and Water' which was developed in collaboration with Mississaugas of the Credit First Nation (the Treaty-holding First Nation in the watershed) and includes information on the treaties within the watershed, the history of the land, and the Mississaugas' relationship to water.

a) **Section 1 Introduction and Background**: provides an overview of the rationale and policy basis for watershed planning, the local context and considerations, and details of engagement;
b) **Section 2 Water Resource and Natural Heritage Systems:** describes the key components of each system and provides an overview of how these two integrated systems provide essential ecosystem services;
c) **Section 3 Existing Watershed Conditions**: describes the current watershed conditions for four key watershed components, including the Water Resource System, Natural Heritage System and Urban Forest, Water Quality, and Natural Hazards, and a comparison of trends over the last 20 years. The findings show that the key issues in the Etobicoke Creek watershed that will need to be addressed to improve watershed health include:
    - **Water Resource System:** aquatic habitat conditions are poor, and the watershed has a high amount of runoff entering streams and in-stream barriers that affect aquatic ecosystem health;
    - **Natural Heritage System and Urban Forest**: there is a low amount of natural cover and habitat quality is generally 'poor'. The remaining natural cover is highly vulnerable to the effects of climate change;
    - **Water Quality**: surface water quality is generally poor compared to other TRCA watersheds; and
    - **Natural Hazards**: the watershed can be categorized as medium/high erosion sensitivity and has six Flood Vulnerable Clusters (two in Brampton, three in Mississauga, and one in Toronto);
d) **Section 4 Future Watershed Conditions**: outlines the four potential future management scenarios that were assessed to help understand how watershed conditions may change in the future. This included examining the impacts of different levels of land use change, climate change (where possible), and the benefits of watershed enhancements on watershed health. Watershed enhancements included improvements to natural cover, urban forest canopy cover, and stormwater management practices, such as low impact development measures. Generally, the scenario analysis determined that as urbanization increases and climate changes, there will be negative impacts to all four watershed components, which affects watershed health and resilience. However, the watershed enhancements help mitigate these impacts and contribute to a safer, healthier, and more resilient watershed;
e) **Section 5 Management Framework**: outlines what needs to be done to protect, enhance, and restore the health of the watershed. The framework includes eight objectives, 10 indicators, and 36 management

actions under three main goals related to: 1) Land Use; 2) Water Resource System; and 3) Natural Heritage System and Urban Forest;

f) **Section 6 Implementation, Monitoring and Evaluation**: provides an overview of the process to be used for implementation, tracking, and reporting of the ECWP. This includes identifying resources and funding required for implementation. Also, this section provides information on the inventory, monitoring, and analysis that will take place to evaluate watershed health over time and inform adaptive management; and
g) **Sections 7-9 Maps, Glossary, References, and Appendices**: these sections contain supporting resources in the form of key maps showing priority areas to help focus implementation, a glossary of terms, references, and two appendices with supporting information.

Overall, the ECWP provides a comprehensive and integrated science-based foundation to minimize and mitigate the existing and potential future watershed issues associated with land use and climate changes (related to water resources, natural heritage and urban forest, water quality, and natural hazards). The management framework identifies implementable management actions that will improve overall watershed health by reducing the risks associated with flooding and erosion, increasing natural and urban forest cover, connectivity, and biodiversity, and generally helping to sustain healthy and resilient ecosystems and safer human communities over the long term.

Engagement Approach and Feedback

Since project initiation, the development of the ECWP has been a collaborative process with TRCA, municipal partners, Mississaugas of the Credit First Nation, and the GTAA guiding the process as Steering Committee members.

In addition, engagement with Credit Valley Conservation, additional First Nations and Indigenous communities, watershed stakeholders, and the public has taken place throughout the watershed plan development process. The purpose of this engagement was to receive input and feedback on the watershed plan and to raise awareness about key issues in the watershed.

Engagement has occurred using a variety of methods and activities to ensure the greatest degree of engagement possible. This included regular updates to the ECWP project webpage and social media posts, as well as seeking input using online interactive tools. TRCA also circulated direct notifications at key milestone points to the following:

- First Nations and Indigenous communities;
- Local and regional Councillors whose wards are in the watershed;
- TRCA Board of Directors members;
- Regional Watershed Alliance members;
- Webpage subscribers (active since 2020);
- Watershed stakeholders and the public on the project stakeholder list; and
- Steering Committee members for distributions through their channels.

Watershed stakeholders who were directly engaged throughout ECWP development included Building Industry and Land Development Association (BILD) and other developers in the watershed, community groups and resident associations, golf courses, major private landowners, and non-governmental organizations. In addition, TRCA completed a series of targeted engagement sessions from 2020 to 2023, including four webinars, five open houses, and one watershed tour.

Below is a summary of key engagement activities that have taken place over the course of development of the ECWP:

a. **Dedicated project webpage:** 15,642 page views and 10,924 unique visitors (September 2020 – June 2024);
b. **Project webpage/email subscribers:** 75 subscribers (as of August 2024);
c. **Project specific email:** maintained and monitored since 2020;
d. **Project stakeholder list:** ~80 stakeholders;
e. **Fall 2020 online engagement survey** related to issues of concern/watershed vision: 50 responses;
f. **Spring 2022 online engagement survey** related to results of characterization and scenario analysis and soliciting feedback on the management framework:145 responses;
g. **Spring 2022 open houses and webinars**: three public open houses in May 2022 held in Mississauga, Brampton, and Caledon (20 participants); two virtual webinars in May 2022 (30 participants);
h. **Summer 2023 open houses and webinars for draft ECWP**: two public open houses in September 2023 held in Mississauga and Brampton (21 participants); two virtual webinars in September 2023 (18 participants); approximately 420 watershed stakeholders, residents, and the public directly engaged during draft ECWP public review period (excluding social media/media campaign);
i. **Online interactive ECWP**: 2201 views since publication (July 2023 – August 2024); and

j. **Fall 2023 watershed tour**: hosted by TRCA staff on October 17, 2023 for TRCA Board members, municipal Councillors, municipal senior leadership staff, and ECWP Steering Committee members (31 participants).

Engagement Summary Reports were prepared throughout the watershed planning process to document feedback from watershed stakeholders and the public, and are publicly available on the project webpage. Overall, the completed engagement activities indicated that watershed stakeholders and the public are highly concerned about the state of the Etobicoke Creek watershed and there is strong support for an integrated watershed planning process.

Public Review of the Draft ECWP in 2023

The most recent Engagement Summary Report (Attachment 2) outlines all comments received on the draft ECWP and responses as well as a summary of the key changes made to the ECWP based on engagement feedback. The most popular method of engagement for the draft ECWP was through the online comment form, which was available through the project webpage.

In summary, many members of the public noted the importance of many of the priority actions outlined in the management framework. These actions included LID/green infrastructure implementation, reduction in impervious cover, aquatic health, naturalization and restoration in the watershed, land acquisition, trail network, invasives species management, and spills management. Members of the public also noted the need to include/clarify the following in the ECWP:

- Include information on implementation, tracking, and reporting;
- Emphasize the level of commitment required by TRCA, municipalities, and other partners/stakeholders to ensure successful implementation of the ECWP, and the role of municipalities in the development and implementation of the ECWP;
- Clarify that the ECWP outlines the actions required to protect, enhance, and restore watershed health at the watershed scale, and that detailed site-level investigations and technical studies will be required to obtain local/site level information to help inform and assess the suitability for implementation of some of the management actions. More detailed information may need to be collected as part of subwatershed planning,

environmental assessments, development and planning applications/approvals, etc.;
- Clarify the purpose of the future management scenario analysis stage; and
- Simplify the messages in the ECWP and during the engagement presentations and provide online/interactive maps.

Municipal Committee and Council Endorsement/Adoption

It is important that partner municipalities within the watershed take the ECWP to their respective decision-making bodies and/or Councils for endorsement (or equivalent) to emphasize that the ECWP is a collaborative and shared plan developed by all partners. This will help to ensure that all partner organizations continue to be committed to the watershed plan and its implementation.

The ECWP aligns with, and the management actions will largely be implemented through, various municipal policies, programs, studies, and initiatives including recently updated Official Plans. The following provides details of the endorsements/adoptions of the ECWP that were obtained, or are anticipated, from municipal Committees and/or Councils:

- The ECWP was endorsed by City of Toronto Council on April 17, 2024 (after consideration/adoption by Planning and Housing Committee on April 5, 2024);
- The ECWP deputation/presentation was adopted by City of Mississauga Council on April 17, 2024 (after recommendation from the Mississauga Environmental Action Committee on April 2, 2024, and consideration at General Committee on April 10, 2024);
- The ECWP was endorsed by Region of Peel Council on June 13, 2024;
- The ECWP was endorsed by City of Brampton Council on September 11, 2024 (after recommendation from Committee of Council on September 4, 2024); and
- The ECWP was endorsed by Town of Caledon Council on October 22, 2024 (after recommendation from General Committee on October 15, 2024).

Relationship to TRCA's 2023-2034 Strategic Plan

This report supports the following Pillars and Outcomes set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 1 Environmental Protection and Hazard Management:

1.3 Maintain healthy and resilient watershed ecosystems in the face of a changing climate

Pillar 1 Environmental Protection and Hazard Management:

1.4 Balance development and growth to protect the natural environment ensuring safe sustainable development

Pillar 2 Knowledge Economy:

2.1 Research and development that drives innovation and climate-based solutions

Pillar 2 Knowledge Economy:

2.4 Integrate environmental considerations and science into decision making

FINANCIAL DETAILS

The development of the ECWP and engagement for the ECWP was supported by capital funding from the Region of Peel and the City of Toronto (capital levy accounts 120-02). TRCA technical staff involvement was also supported through a variety of other accounts. Additionally, TRCA staff secured external funding in the form of grants from Mitacs Inc. to complete parts of the project.

DETAILS OF WORK TO BE DONE

The ECWP provides a strong basis for the protection and enhancement of the watershed, and can be used by the City of Toronto, Region of Peel, and local municipalities to inform future land use and infrastructure planning processes and other initiatives.

Following TRCA's Board of Directors approval, if received, the ECWP will be considered final and TRCA will communicate the final approval of the ECWP to partners, watershed stakeholders, and the public. TRCA staff will also establish an Implementation Steering Committee and commence work on implementing the ECWP in collaboration with the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, Mississaugas of the Credit First Nation, and the GTAA.

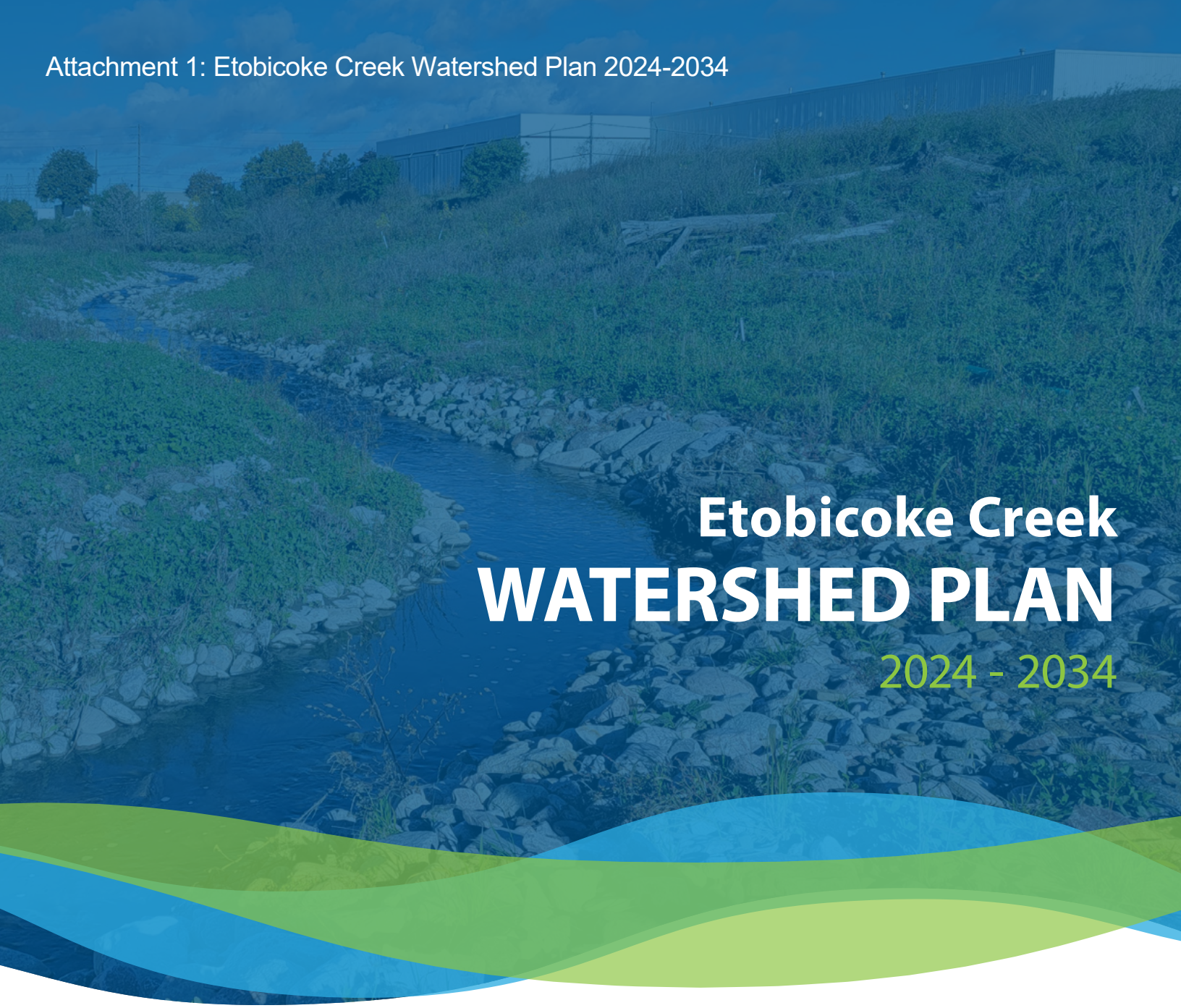
Opportunities to leverage existing partnerships, committees, and forums, such as the Peel Climate Change Partnership, Partners in Project Green, Rural Water Quality Program, Sustainable Neighbourhood Action Plan, and Sustainable Technologies Evaluation Program to implement elements of

the watershed plan will be explored. In collaboration with our municipal partners, TRCA staff will also continue to facilitate engagement with additional First Nations and indigenous communities, watershed stakeholders, and public, as needed, to ensure effective implementation of the ECWP.

The ECWP is intended to be in effect for 10 years from when it is finalized and approved (2024-2034). Collaborative and comprehensive implementation, tracking, and reporting of all aspects of the watershed plan will be essential to fully realize the vision for the watershed, demonstrate accountability and transparency, improve watershed health, and ensure safe and sustainable waterways, ecosystems, and human communities.

Report prepared by: Namrata Shrestha, Senior Manager, Watershed Planning & Reporting; Elizabeth Speller, Senior Project Manager, Watershed Planning & Reporting
Email: namrata.shrestha@trca.ca; elizabeth.speller@trca.ca
For Information contact: Namrata Shrestha, (437) 772 - 3025
Email: namrata.shrestha@trca.ca
Date: September 13, 2024
Attachments: 2

Attachment 1: Etobicoke Creek Watershed Plan 2024-2034
Attachment 2: Engagement Summary 3 - Etobicoke Creek Watershed Plan



Etobicoke Creek
WATERSHED PLAN
2024 - 2034

The Land and Water

Etobicoke Creek Watershed is covered by Treaty 13 (Toronto Purchase), Treaty 14 (Head of the Lake Purchase), and Treaty 19 (Ajetance Purchase) signed with the Mississaugas of the Credit. The land in the watershed is the territory of the Mississaugas of the Credit, and the traditional territory of the Haudenosaunee and the Wendat peoples, and is now home to many diverse First Nations, Inuit, and Métis peoples. Treaties 13 and 14 reserved Etobicoke Creek as a fishery for the Mississaugas of the Credit.

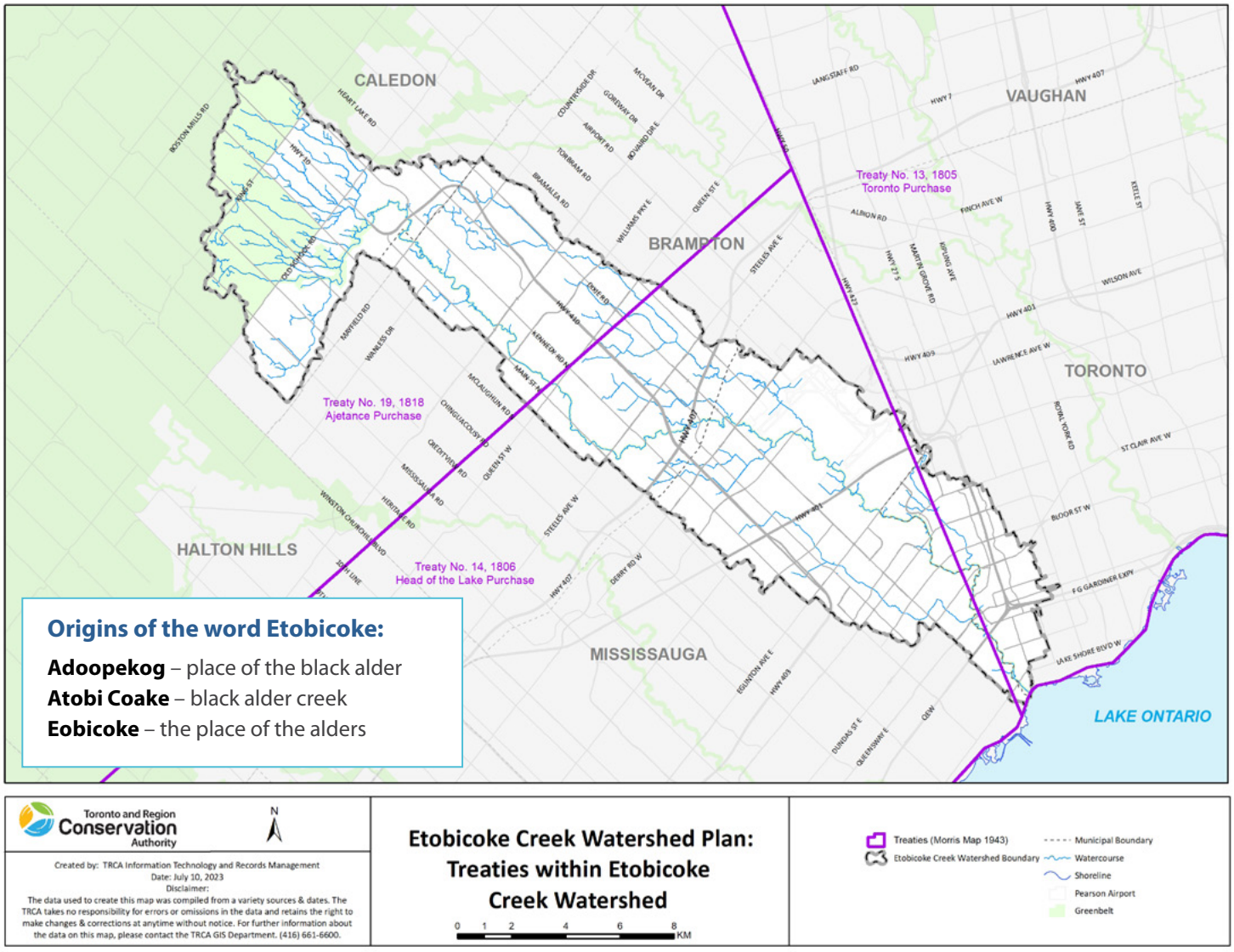


FIGURE 1: Treaties Map

The Mississauga peoples used the land around Etobicoke Creek seasonally and as a salmon fishery before being displaced by settlers. This led to a collapse of the traditional economy.

The Mississaugas' relationship to water is embedded in their creation story, its teaching, and prophecies. This story, Kiinwi Debaadjmowin, tells us that everything is interconnected as intricate systems. This interconnectedness is explained in the first seven fires of creation. Creation birthed life through the projection of first thought and heartbeat. The seven fires grew in succession – the stars, the sun, the moon, movement, seeds of life, Earth, and human beings.

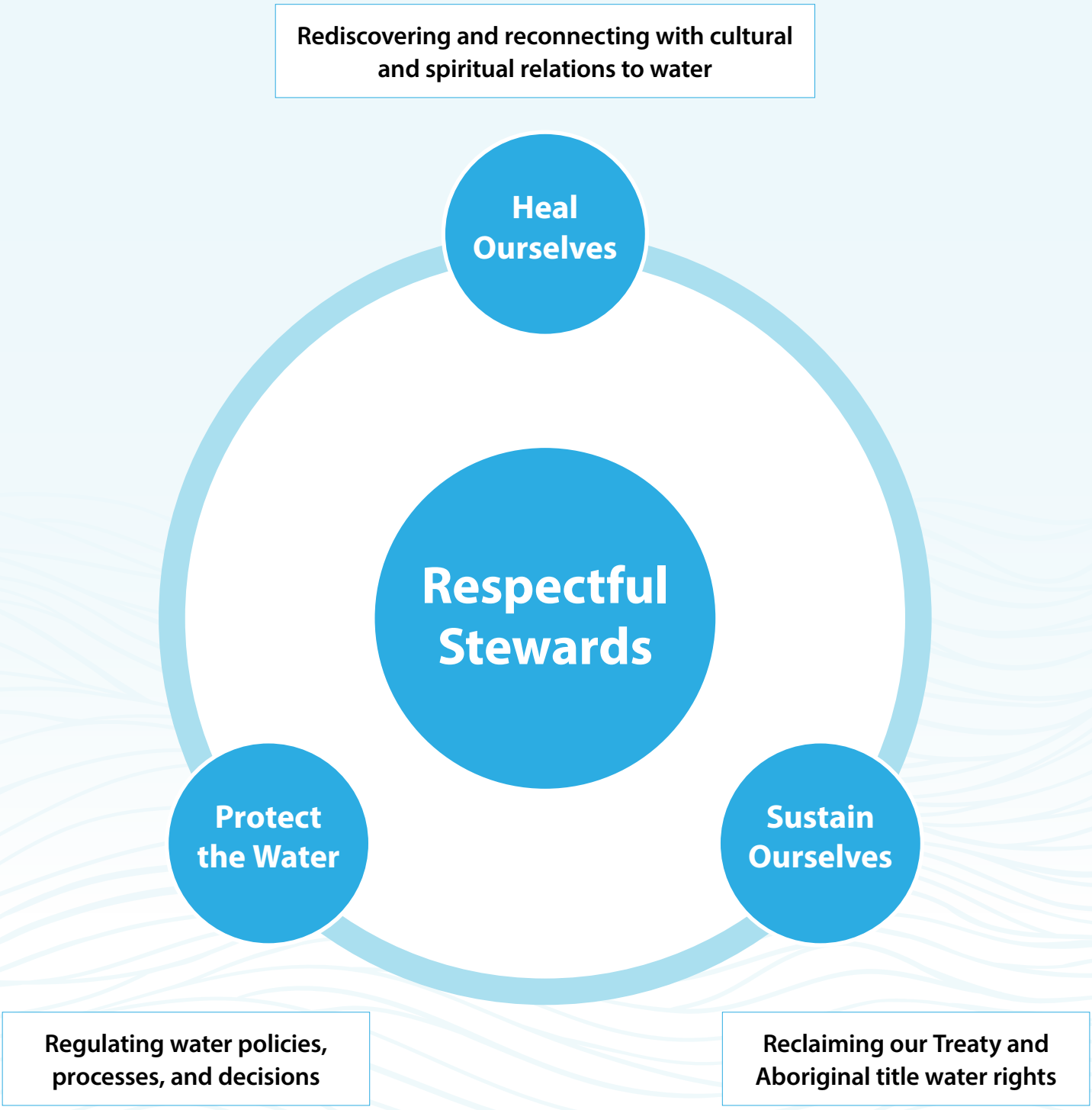


FIGURE 2:
Mississaugas of the Credit First Nation Water Framework Principles for Reconciliation

Executive Summary

A watershed is an area that is drained by a river and its tributaries. Healthy watersheds provide numerous ecosystem services such as supporting biodiversity, providing clean drinking water, reducing flood and erosion hazards, protecting the quality and quantity of water, and improving climate resiliency. Due to the importance of healthy watersheds, they merit collaborative efforts to ensure their long-term sustainability.

Ontario's provincial planning framework recognizes that watershed planning is important to inform land use and infrastructure planning decisions. The purpose of a watershed plan is to understand current and potential future watershed conditions, and identify measures to protect, enhance, and restore watershed health. Watershed planning integrates natural systems into land use and infrastructure decision-making, and climate adaptation planning. It helps identify natural features and areas to protect and develop mitigation measures to minimize the impacts of various land use types and climate change.

The development of this watershed plan has been a collaborative effort between Toronto and Region Conservation Authority (TRCA), the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, Mississaugas of the Credit First Nation (MCFN), and the Greater Toronto Airports Authority (GTAA). Additional First Nations and Indigenous communities, stakeholders, and members of the public have been involved throughout the watershed planning process. Reflecting the collective input, a vision for the watershed was developed at the beginning of the watershed planning process which guided the development of the Etobicoke Creek Watershed Plan.

WATERSHED VISION:

Etobicoke Creek watershed is protected and restored to a cleaner, healthier, and more natural state, to sustain its waterways, ecosystems, and human communities.

Etobicoke Creek is a heavily urbanized watershed with eight subwatersheds at the western end of TRCA's jurisdiction. Urbanization and climate change continue to be major stressors for the health and resiliency of the watershed. This watershed plan recognizes these challenges and identifies actions to protect, enhance, and restore the health of the Etobicoke Creek watershed.

The Etobicoke Creek Watershed Plan focused on assessing four main components that are important for watershed health and identifies priorities for improving them:

Water Resource System
(i.e. aquatic habitat, in-stream barriers, and groundwater conditions)

Natural Heritage System and Urban Forest
(i.e. terrestrial habitat quantity, quality, and connectivity, tree canopy cover, and sensitive species)

Water Quality
(i.e. surface water quality)

Natural Hazards
(i.e. flooding and erosion)

The development of the Etobicoke Creek Watershed Plan was a multi-stage process that consisted of:

1 **Watershed Characterization (i.e. Existing Conditions)**

The key issues with the Etobicoke Creek watershed are:

- Aquatic habitat conditions are poor and the watershed has a high amount of runoff and in-stream barriers that affect aquatic ecosystem health.
- Natural cover is low, mostly of poor quality, and is vulnerable to climate changes.
- Surface water quality is generally poor compared to other TRCA watersheds.
- The watershed has six Flood Vulnerable Clusters with a total area of 508 hectares and can be categorized as medium or high erosion sensitivity.

2 **Future Management Scenario Analysis (i.e. Future Conditions)**

Four potential future management scenarios were assessed to understand the impacts of different levels of land uses, climate change (where possible), and watershed enhancements (e.g. improvements to natural cover, urban forest canopy, and stormwater management) on watershed health.

- **Scenario 1: Urban Expansion with Minimal Enhancements** – further urbanization in the Headwaters with no enhancements to natural cover and stormwater management.
- **Scenario 2: Urban Expansion with Mid-Range Enhancements** – further urbanization in the Headwaters with moderate enhancements to natural cover and stormwater management.
- **Scenario 3: Urban Expansion with Optimal Enhancements** – further urbanization in the Headwaters with optimal enhancements to natural cover and stormwater management.
- **Scenario 4: Existing Urban Boundary with Optimal Enhancements** – current urban boundary is maintained with optimal enhancements to natural cover and stormwater management.

These potential future management scenarios helped determine how the watershed may respond to potential future land use and climate changes (i.e. will conditions improve, stay the same, or deteriorate). Scenario analysis does not result in decisions about the type and configuration of land uses. Instead, scenario analysis helps to inform municipal planning decisions including land use and infrastructure planning decisions.

The scenario analysis results highlighted that, with changing land uses and climate, all four watershed components are negatively impacted, which affects overall watershed health. However, the watershed enhancements help mitigate these impacts and contribute to a safer, healthier, and more resilient watershed.

3 Implementation Planning

This stage involved the development of a realistic and achievable management framework with three goals, eight objectives, 10 indicators, and 36 management actions outlining how to protect, enhance, and restore watershed health and build resiliency to land use and climate changes. The management framework (including the management actions) was developed collaboratively by TRCA, the municipalities within the watershed, MCFN, and the GTAA. It is based on the results from the characterization and future management scenarios stages, and on engagement feedback.

The management framework is designed to address existing watershed issues and mitigate impacts from potential future land uses and climate changes at the watershed scale. Additional detailed site-level investigations and technical studies will be required (as appropriate and as part of subwatershed planning, environmental assessments, development and planning applications/approvals, etc.). Further studies will provide local/site level information to help inform and assess the suitability for implementation of some of the management actions (e.g. stormwater controls and the use of low impact development and green infrastructure techniques).

The management framework is focused on:

- Achieving more sustainable land use and infrastructure development patterns through the use of low impact development and green infrastructure, improved stormwater management, mitigating flood and erosion risk, and improving rural land stewardship.
- Protecting, enhancing, and restoring the Water Resource System and improving aquatic habitat connectivity.
- Protecting, enhancing, and restoring the Natural Heritage System and increasing urban forest cover.

An inventory, monitoring, and evaluation program will help track implementation progress, evaluate and report on whether watershed conditions are improving, and ensure mechanisms are in place to adjust and adapt approaches as needed.

Once final approvals and endorsements of the Etobicoke Creek Watershed Plan have been obtained in 2024 from municipal committees and Councils and from TRCA's Board of Directors, implementation of the watershed plan will begin. The Etobicoke Creek Watershed Plan is intended to be in effect for 10 years from when it is finalized and approved. Collaborative and comprehensive implementation, tracking, and reporting of all aspects of the management framework will be essential to fully realize the vision for the watershed and to improve watershed health and ensure sustainability of its ecosystem services for current and future generations.

An **Implementation Steering Committee** consisting of TRCA, the municipalities within the watershed, MCFN, and the GTAA will be established in 2024 to guide and support implementation and will be facilitated by TRCA. The Implementation Steering Committee will work together to create a detailed implementation, tracking, and reporting plan to ensure commitment to and accountability for implementation on the part of TRCA, our municipal partners, and other stakeholders.

Through the implementation of the Etobicoke Creek Watershed Plan, all watershed partners and stakeholders can contribute to a healthier, more sustainable, and more resilient watershed that can provide long-term benefits to all residents.

Explore the online interactive Etobicoke Creek Watershed Plan and a map viewer with useful mapping layers here.

FIGURE 3:
Heart Lake Aerial Image

FIGURE 4:
What is a Watershed?

WHAT IS A WATERSHED?

An area that is drained by a river and its tributaries. Wherever you are right now, you are in a watershed.

WATERSHEDS DELIVER IMPORTANT BENEFITS

Human – provide safe drinking water and food, and help to reduce flooding and erosion.

Economic – produce energy, and supply water for agriculture, industry and homes.

Environment – promote a healthy water cycle, and provide vital habitat for wildlife and plants.

What is the Natural Heritage System?

Consists of natural features and areas, including wetlands, forests, meadows and valleylands, that are needed to maintain biodiversity and healthy ecosystems.

How can agriculture impact a watershed?

Agricultural areas provide valuable greenspace and reduce stormwater, since precipitation can penetrate the soil. On the other hand, agricultural fields can release harmful contaminants into waterways as excess nutrients (e.g. phosphorous) and pesticides. Soil erosion from fields can increase the amount of sediment in waterways negatively affecting aquatic ecosystems.

What is the Water Resource System?

Consists of groundwater and surface water features and areas, including streams, lakes, groundwater recharge areas and springs, needed to sustain healthy aquatic and terrestrial ecosystems, and human water supply.

How can urbanization impact a watershed?

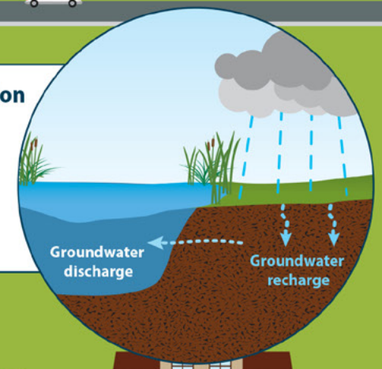
Since impervious surfaces (roads, buildings, parking lots) prevent water from penetrating into soil, stormwater runoff can carry contaminants into waterways and increase the likelihood of flooding. Infrastructure and land use development can degrade habitat, reducing the quality and quantity of natural systems and their connectivity.

What causes flooding?

Rivers naturally flood with heavy rain or snowmelt, but flooding can become a problem when buildings and other structures are placed in floodplains. Climate change and urbanization can make flooding worse.

Surface and Groundwater Interaction

Rain and melting snow penetrate the soil in permeable areas draining into an aquifer (i.e. groundwater recharge areas). That groundwater can then discharge at springs into streams, wetlands or other surface water features.



How can salt impact a watershed?

Chlorides can contaminate drinking water and negatively affect the health of aquatic species.

What is stormwater?

Rain and melting snow rushes off roofs, sidewalks and parking lots into pipes and pours into streams and lakes. Without proper stormwater control and treatment, flooding and erosion can increase, waterways can become polluted and local ecosystems can be damaged.

Benefits of the Urban Forest

All trees in a city collectively help to remove pollutants from air and water, reduce stormwater runoff, cool communities, save energy, and improve human health and well-being.

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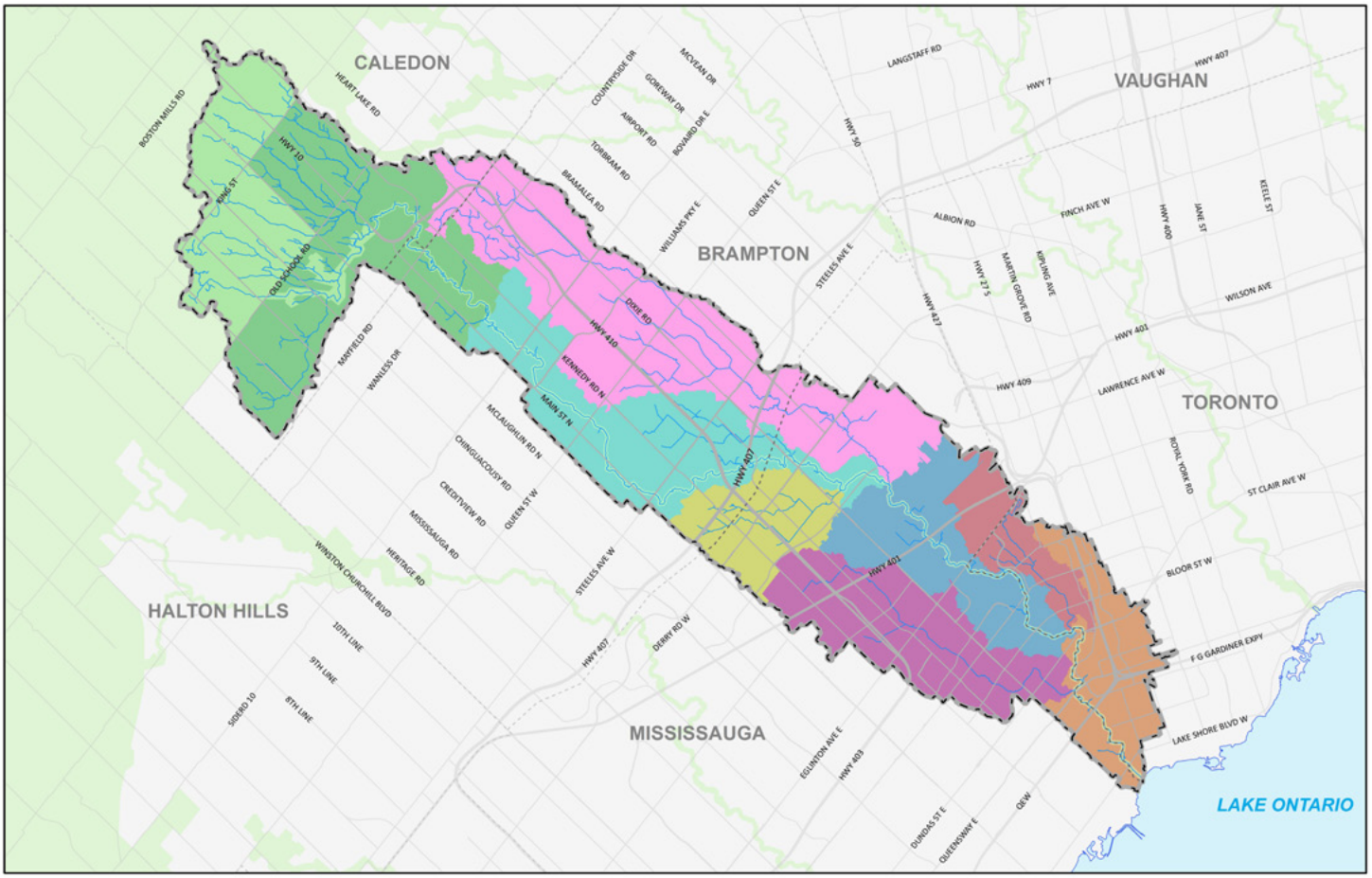
ACRONYMS

CEW	Cumulative Effective Work
CTC	Credit Valley – Toronto and Region – Central Lake Ontario
CWQG	Canadian Water Quality Guidelines
ECWP	Etobicoke Creek Watershed Plan
ELC	Ecological Land Classification
ESGRA	Ecologically Significant Groundwater Recharge Area
FBI	Family Biotic Index
FVC	Flood Vulnerable Cluster
GTA	Greater Toronto Area
GTAA	Greater Toronto Airports Authority
HDF	Headwater Drainage Feature
IBI	Index of Biotic Integrity
LAM	Landscape Analysis Model
LID	Low Impact Development
MCFN	Mississaugas of the Credit First Nation
NHS	Natural Heritage System
PPS	Provincial Policy Statement
PWQO	Provincial Water Quality Objectives
ROP	Regional Official Plan
SGRA	Significant Groundwater Recharge Area
TOE	Time of Exceedance
TRCA	Toronto and Region Conservation Authority
TSS	Total Suspended Solids
WRS	Water Resource System

1. Introduction and Background

The Etobicoke Creek watershed is at the western end of TRCA's jurisdiction and is heavily urbanized. The watershed begins in the Greenbelt in the Town of Caledon before flowing south through the City of Brampton and City of Mississauga, and ultimately entering Lake Ontario in the City of Toronto. The watershed consists of eight subwatersheds as shown in **Figure 5**.

FIGURE 5:
Etobicoke Creek Subwatersheds



The last watershed plan for Etobicoke Creek was developed in 2002, with some technical updates completed in 2010. Since then, watershed science has advanced, and provincial policies have explicitly recognized the importance of watershed planning in informing land use and infrastructure planning decisions.

This watershed plan represents a collaborative effort between TRCA, the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, MCFN, and the GTAA, and outlines what needs to be done to improve the health of the Etobicoke Creek watershed and ensure the sustainability of its ecosystem services for current and future generations.

The development of the Etobicoke Creek Watershed Plan was a multi-stage process that consisted of:

1. **Watershed Characterization (2020-2021)** – to determine current watershed conditions for four key components including the Water Resource System, Natural Heritage System and Urban Forest, Water Quality, and Natural Hazards (i.e. flooding and erosion).
2. **Future Management Scenario Analysis (2021-2022)** – to assess potential future management scenarios to understand how watershed conditions may change including examining the impacts of different potential future land uses, varying levels of watershed enhancements (e.g. stormwater management improvements and increased natural and urban forest cover), and the implications of climate change (where possible).
3. **Implementation Planning (2022-2024)** – to develop a realistic management framework with priority actions to protect, enhance, and restore watershed health and to ensure the long-term sustainability and resiliency of the watershed.

This watershed plan has a ten-year time frame. To fully realize the vision for the watershed plan, collaborative and comprehensive implementation by TRCA, the municipalities in the watershed, and other stakeholders of all aspects of the management framework (**outlined in Section 5 - Management Framework**) is essential.

Through regular inventory, monitoring, and evaluation, including adaptive management, the watershed plan will be updated or refined as needed on an ongoing basis.

Explore the online interactive Etobicoke Creek Watershed Plan and a map viewer with useful mapping layers here.

1.1 RATIONALE AND POLICY BASIS

Watershed planning provides a comprehensive framework or road map for ensuring healthy watersheds and building resilience to land use and climate changes. Healthy watersheds provide numerous ecosystem services such as supporting biodiversity, providing clean drinking water, reducing flood and erosion hazards, protecting the quality and quantity of water, improving climate resilience, and generally contributing to community health and well-being and long-term sustainability.

Watershed planning is a vital process for understanding the current and potential future conditions of a watershed, and identifying measures to protect, enhance, and restore the health of a watershed. Watershed plans provide a comprehensive and integrated understanding of the form and function of the natural hazards, features, and areas that comprise the water resource and natural heritage systems. Although watershed plans do not make land use planning decisions, they do help to inform land use and infrastructure planning and other municipal initiatives, such as programs in greenlands acquisition, reforestation, and stormwater management retrofit. This subsection will explain the provincial policy basis for watershed planning and the roles of municipalities and TRCA in implementing the policy framework.

Provincial Watershed Planning Policy Basis

Ontario's planning policy framework recognizes the importance of watershed planning to inform land use and infrastructure decision-making. Policies in the Provincial Policy Statement, 2020 (PPS), the Growth Plan for the Greater Golden Horseshoe, 2020 (Growth Plan), and the Greenbelt Plan, 2017, provide direction related to watershed planning.

PPS policies encourage a coordinated approach to planning that recognizes the watershed as the ecologically meaningful scale for integrated and long-term planning. The PPS also emphasizes the importance of protecting, improving, and restoring the quality and quantity of water by minimizing potential negative impacts. Growth Plan and Greenbelt Plan policies also require watershed planning to be undertaken by municipalities, partnering with conservation authorities as appropriate, to support a comprehensive, integrated, and long-term approach to the protection, enhancement, or restoration of the quality and quantity of water within a watershed.

Watershed planning is also to be used to identify the Water Resource System (WRS), inform decisions on allocation of growth, and inform planning for water, wastewater, and stormwater infrastructure.

Provincial policies also recognize the importance of protecting, enhancing, and restoring the Natural Heritage System (NHS) to maintain long-term ecological and hydrologic functions. The integrated nature and importance of the natural heritage and water resource systems are discussed in greater detail in **Section 2 - Water Resource and Natural Heritage Systems**.

The *Planning Act* requires that all decisions in respect of planning matters are consistent with the PPS and conform with applicable provincial plans.

The purpose of Ontario's *Clean Water Act, 2006* is to protect existing and future sources of drinking water. Under the Act, source protection committees are responsible for preparing source protection plans. The Credit Valley – Toronto and Region – Central Lake Ontario (CTC) Source Protection Plan applies in the Etobicoke Creek watershed. The CTC Source Protection Plan is a strategy and suite of policies developed by residents, businesses, and municipalities, which outlines how water quality and quantity for drinking water systems, not including private well owners, will be protected. The CTC Source Protection Plan includes its own set of policies that are not repeated in this watershed plan. The management actions identified in this watershed plan complement the requirements of the CTC Source Protection Plan by including the need to protect water resources, which will support clean and safe drinking water.

Finally, Ontario's planning policies recognize the importance of the Great Lakes. Etobicoke Creek flows into Lake Ontario. The various Great Lakes agreements, legislation, and policies set binational, national, and provincial commitments to protect and restore the Great Lakes. Municipalities must consider the Great Lakes Strategy, the targets and goals of the *Great Lakes Protection Act*, 2015, and any applicable Great Lakes agreements as part of watershed planning and coastal or waterfront planning initiatives. This watershed plan is intended to improve conditions in the Etobicoke Creek watershed, thereby reducing negative impacts to Lake Ontario.

Role of Municipalities

Municipalities in Ontario are organized into single-tier or two-tier systems. Upper-tier municipalities, such as the Region of Peel, are comprised of multiple lower-tier municipalities (e.g. City of Mississauga). The role of regional government is to address issues and concerns across broader geographic areas, as set out under the *Municipal Act* and other provincial legislation. The City of Toronto is a single-tier municipal government, which means it assumes all municipal responsibilities as set out under the *City of Toronto Act* and other provincial legislation.

Municipalities implement the watershed planning requirements of provincial legislation, plans, and the PPS. As noted above, watershed planning helps municipalities make informed decisions on where and how to grow in a way that minimizes and/or mitigates impacts to watershed health and also informs other municipal initiatives.

Role of TRCA

Conservation Authorities (CAs) are established and governed under the *Conservation Authorities Act*. The purpose of the Act is to provide for the organization and delivery of programs and services that further the conservation, restoration, development, and management of natural resources in watersheds. While conservation authorities are not the decision-makers in land use and infrastructure planning, they play an important role by advising municipalities and infrastructure providers on matters related to natural hazards, wetlands, and source protection, and by collecting and providing scientific data on watershed management and resilience to climate change outside the plan review function. Conservation authorities also administer a development activity permit process under section 28 of the Act for conservation authority regulated areas consisting of river and stream valleys, wetlands, watercourses, and shorelines.

Through its watershed expertise, TRCA, in collaboration with its partner municipalities, MCFN, and the GTAA, has developed this watershed plan to help inform municipal growth management and various other initiatives including ecosystem restoration planning, land management/acquisition, and low impact development and green infrastructure implementation.

1.2 LOCAL CONTEXT AND CONSIDERATIONS

The Etobicoke Creek watershed is approximately 22,404 hectares in size and is the westernmost watershed in TRCA's jurisdiction. It is bordered by the Credit River watershed to the west and the Mimico Creek and Humber River watersheds to the east.

Etobicoke Creek also forms the western boundary of the Toronto Purchase (Treaty #13 in 1805) and the eastern boundary of the Head of the Lake Purchase (Treaty #14 in 1806) and lies within the Ajetance Purchase (Treaty #19 in 1818). The Toronto Purchase reserved the Mississaugas' exclusive fishing rights in Etobicoke Creek.

The Etobicoke Creek watershed is heavily urbanized (approximately 60% as of 2019) and contains a large amount of industrial and commercial land uses, including the majority of Lester B. Pearson International Airport. The only remaining rural portions of the watershed fall within the Headwaters subwatershed in the Town of Caledon. This watershed has one of the lowest amounts of natural cover in TRCA's jurisdiction.

Mouth of Etobicoke Creek

Historically, the mouth of Etobicoke Creek was a wetland providing extensive habitat along the Lake Ontario shoreline. The first engineered alteration of the lower part of the Creek was in 1929, when the sandbar across the mouth was reinforced to allow the extension of an adjacent road.

When Hurricane Hazel hit in 1954, the water level in the channel was at least four times its capacity, destroying homes and causing seven deaths. Over the next few years, municipal and provincial governments purchased the land in the flood plain, converting the area into Marie Curtis Park. By 1959, no trace of the original creek mouth remained. Today, the flood plain lands are owned by TRCA, but managed by the City of Toronto.

Brampton Esker

The Etobicoke Creek watershed is home to the only esker in TRCA's jurisdiction. An esker is a long, winding ridge of sand and gravel deposited by glacial meltwaters, which flowed through crevasses and channels within or beneath an ice sheet.

The Brampton Esker's northern end is located just to the north of Mayfield Road and runs south for approximately eight kilometres to Queen Street. It is around 1.8 km wide with its eastern edge following Highway 410. The sands and gravels of the Brampton Esker hold and purify water as it percolates downward, making the esker an important groundwater resource and the source of Spring Creek, a tributary of Etobicoke Creek.

FIGURE 6: Open House on Watershed Plan, May 2022 (Mississauga) *(left)*
FIGURE 7: Open House on Watershed Plan, September 2023 (Brampton) *(right)*

1.3 ENGAGEMENT

The development of this watershed plan commenced in early 2020 through the establishment of a Steering Committee consisting of representatives from TRCA, the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, MCFN, and the GTAA. The municipal staff members on the Steering Committee were responsible for providing input and guidance throughout the development of the watershed plan on behalf of their respective municipalities (including consolidating comments from various municipal teams). Credit Valley Conservation was also involved in the Steering Committee to ensure consistency in watershed planning approaches between neighbouring watersheds.

Throughout the watershed planning process, extensive engagement took place to increase awareness of watershed planning and to solicit feedback on components of the watershed plan.

The following First Nations and Indigenous communities were engaged:

- Mississaugas of the Credit First Nation (member of the Steering Committee as the Treaty holding First Nation within the watershed)
- Williams Treaties First Nations (including Beausoleil First Nation, Chippewas of Rama First Nation, Chippewas of Georgina Island First Nation, Curve Lake First Nation, Mississaugas of Scugog Island First Nation, Hiawatha First Nation, and Alderville First Nation)
- Huron-Wendat Nation
- Six Nations of the Grand River
- Métis Nation of Ontario

Engagement also took place with various stakeholders (including Building Industry and Land Development Association and other developers in the watershed, community/resident groups, golf courses, major private landowners, non-governmental organizations, etc.), watershed residents and the general public, project webpage subscribers, municipal Councillors with ward boundaries within the watershed, Regional Watershed Alliance members, and TRCA Board members. Further engagement opportunities were leveraged through various TRCA teams such as Education and Training, Sustainable Neighborhood Action Program (SNAP), Professional Access Into Employment (PAIE), Newcomer Youth Green Economy Project (NYGEP), Multicultural Connections Program (MCP), and Partners in Project Green (PPG).

EARLY 2020 – MID 2021

Engaged on watershed vision and key issues of concern to undertake watershed characterization.

Released comprehensive Watershed Characterization Report in June 2021.

MID 2021 – MID 2022

Developed potential future management scenarios and carried out technical analyses, culminating in the release of the Future Management Scenario Analysis Report in July 2022.

Engaged on the results of the watershed characterization and future management scenarios stages, and on the objectives and indicators for the watershed plan and priorities for action.

MID 2022 – MID 2023

Developed the management framework for the watershed plan and the draft watershed plan, and engaged on the draft watershed plan.

Feedback received from First Nations and Indigenous communities, partners, stakeholders, watershed residents, and the general public was invaluable to the development of this watershed plan. The Etobicoke Creek Watershed Plan reflects the diversity of issues and concerns raised throughout the process and represents an achievable plan to improve watershed conditions.

Engagement Summary Reports

Engagement Summary reports were prepared throughout the watershed planning process and provide details of the engagement activities. These reports are referenced in **Section 9 - References** and are publicly available on the project webpage.

2. Water Resource and Natural Heritage Systems

The land (i.e. terrestrial) and water (i.e. aquatic) features and areas that maintain watershed and ecological health consist of two integrated systems: the Water Resource System (WRS) and the Natural Heritage System (NHS). Together, these systems provide essential ecosystems services, such as water storage and filtration, cleaner air, support to biodiversity and habitats, carbon storage, and improving resiliency to climate change. Maintaining extensive, connected, and high-quality features and areas of both systems is essential for the long-term health and sustainability of the watershed, as shown in **Figure 4**.

Identifying, protecting, enhancing, and restoring both systems is a key policy requirement of the Growth Plan and the Greenbelt Plan.

Ecosystem Services

Ecosystem services are the benefits to humans provided by natural environments. These benefits cover a wide range of contributions essential for human well-being. They can be classified into four primary categories:

Provisioning services
These are the tangible resources provided by ecosystems including food, water, wood, and medicinal plants. Examples of provisioning services include the harvesting of timber from forests and the availability of various fruits for consumption.

Regulating services
Ecosystems play a crucial role in regulating life in the biosphere. Climate change mitigation/adaptation, water purification, pollination, disease management, and pest control are examples of these regulating benefits. For instance, wetlands contribute to water flow regulation, flood mitigation, and pollutant filtration, and forests sequester, or store, carbon in trees and soil.

Cultural services
These are the intangible benefits provided by ecosystems including recreational opportunities, spiritual fulfillment, and nature appreciation. An example of a cultural service is the recreational enjoyment gained by spending time in nature.

Supporting services
These are essential for enabling various functions within natural ecosystems. Examples include processes like soil formation, the cycling of nutrients, and primary production via photosynthesis. For instance, the cycling of nutrients ensures that vital elements are accessible for plant development.

Natural assets, such as forests, grasslands, and wetlands, are the physical components of ecosystems that support these services. The delivery of ecosystem services depends on the health and functionality of these natural assets. By preserving, enhancing, and sustainably managing these assets, we can ensure the continuous provision of ecosystem services that are essential for human well-being as well as for economic prosperity and ecological equilibrium.

Table 1 explains the features and areas of both systems.

TABLE 1:
Water Resource and Natural Heritage Systems

Water Resource System	Natural Heritage System
A system consisting of groundwater features and areas, surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption.	A system made up of natural heritage features and areas, and linkages identified to provide habitat connectivity and support natural processes, which are necessary to maintain biodiversity and ecosystem functions.
The WRS consists of: **Key Hydrologic Areas** • Significant Groundwater Recharge Areas (SGRAs), including Ecologically Significant Groundwater Recharge Areas (ESGRAs) • Highly Vulnerable Aquifers • Significant Surface Water Contribution Areas **Key Hydrologic Features** • Permanent Streams • Intermittent Streams • Inland Lakes and their Littoral Zones • Seepage Areas and Springs • Wetlands*	The NHS consists of: • Significant Wetlands* • Significant Coastal Wetlands • Other Coastal Wetlands in Ecoregions 5E, 6E, and 7E • Fish Habitat* • Significant Woodlands • Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River) • Habitat of Endangered Species and Threatened Species • Significant Wildlife Habitat • Significant Areas of Natural and Scientific Interest (ANSIs) • Sand Barrens, Savannahs, Tallgrass Prairies, and Alvars • Federal or Provincial Parks, and Conservation Reserves
***Notes:** Wetlands are important features in both systems. Wetlands are shown as features in the mapping for the WRS and as natural cover in the NHS mapping in **Section 7 - Maps**. Fish habitat in the NHS overlaps with features and areas in the WRS. The majority of these terms are defined in the Growth Plan. Some, but not all the definitions, have been included in the Glossary (**Section 8 - Glossary**). Not all these features or areas are necessarily present in the Etobicoke Creek watershed.	

The importance of these systems is reflected in the management framework in **Section 5 - Management Framework**, as the protection, enhancement, and restoration of each system is a goal of this watershed plan.

See **Section 7 - Maps** for maps of each system.

How was the WRS delineated?

The key hydrologic areas and key hydrologic features of the WRS were delineated using various techniques and methodologies. The key hydrologic areas and key hydrologic features of the WRS shown in the maps in **Section 7. Maps** include updates/refinements made for the watershed plan (and are consistent with TRCA's updated 2022 WRS). There are some slight changes from the WRS maps presented in the Watershed Characterization Report which is referenced in **Section 9. References** and is publicly available on the project webpage.

Highly Vulnerable Aquifers and SGRAs were delineated through Technical Rules established under the *Clean Water Act, 2006* for the purposes of source protection planning. ESGRAs were delineated using a model developed by the Oak Ridges Moraine Groundwater Program. The model results for ESGRAs were used to minimize the land area covered by these areas while still maintaining a high level of protection of hydrologic function for these ecosystems. Significant Surface Water Contribution Areas were delineated by overlaying SGRAs and ESGRAs to ensure areas of both volume contribution and recharge-discharge connections to sensitive features are a prevalent component of the WRS.

Each of the five key hydrologic features were delineated using a combination of satellite imagery, ArcHydro GIS, and field site verification.

While not a defined component of the WRS, Headwater Drainage Features (HDFs) are important surface water features that help maintain downstream aquatic health. HDFs are small, temporary streams, swales, or wetlands. HDFs were delineated through an assessment of existing data, satellite imagery, and field sampling. HDFs were classified according to TRCA's Evaluation, Classification, and Management of Headwater Drainage Features Guidelines as permanent (i.e. important hydrology functions), intermittent (i.e. valued or contributing hydrology functions), or unknown (i.e. either valued/contributing hydrology functions or limited hydrology functions). The assessment of HDFs conducted as part of this watershed planning process should be considered preliminary, with additional field verification to be completed if there is to be alteration to lands in the Headwaters. This is reflected in the management actions identified in **Section 5 - Management Framework**.

How was the Watershed Refined Enhanced NHS Delineated?

The features and areas of the watershed refined enhanced NHS were delineated using a robust systems-based methodology that incorporated multiple ecological criteria generated through models (e.g. habitat connectivity model, Landscape Analysis Model), information from recent satellite imagery, monitoring data, field site verification, and expert-based knowledge.

The features and areas of the watershed refined enhanced NHS were identified for their ecological value as existing natural cover and potential natural cover (i.e. areas targeted for restoration and enhancement) to:

- Increase natural cover (e.g. forests, wetlands, meadows, etc.) quantity and quality by improving habitat patch size, shape, and connectivity in and around natural areas.
- Protect and restore biodiversity by incorporating multiple habitat types and mitigating the impacts of urban development on habitat function.
- Incorporate natural system vulnerabilities to climate change in planning processes to build a watershed refined enhanced NHS that is more sustainable and resilient.

FIGURE 8:
Before and After, Kings Park Stream Restoration (Mississauga)

FIGURE 9:
Etobicoke Creek, West of Pearson International Airport

3. Existing Watershed Conditions

Watershed characterization is a vital stage of the watershed planning process, which helps to understand current conditions in the watershed and identify key issues to help inform the next stages of the watershed planning process. As part of this watershed planning process, a technical report on watershed characterization was developed focusing on four key components including the Water Resource System, Natural Heritage System and Urban Forest, Water Quality, and Natural Hazards. This section summarizes key components of those technical analyses.

Watershed Characterization Key Messages (i.e. Existing Conditions)

The Etobicoke Creek watershed is a highly urbanized watershed with a significant amount of impervious cover (i.e. hard surfaces) and low amounts of natural and rural land cover. This has resulted in a high amount of stormwater runoff, issues with flooding and erosion, and impacts to aquatic and terrestrial habitat quantity and quality and to water quality. Climate change including increased precipitation, annual average temperatures, and the intensity and frequency of extreme weather events will add additional strain on a watershed like Etobicoke Creek and will further impact watershed health.

Based on the technical analyses completed as part of watershed characterization, the key issues affecting the Etobicoke Creek watershed that will need to be addressed to improve watershed health include:

Water Resource System
Aquatic habitat conditions are poor, and the watershed has a high amount of runoff and in-stream barriers that affect aquatic ecosystem health.

Natural Heritage System and Urban Forest
There is a low amount of natural cover and habitat quality is generally 'poor'. The remaining natural cover is highly vulnerable to the effects of climate change.

Water Quality
Surface water quality is generally poor compared to other TRCA watersheds.

Natural Hazards
The watershed has six Flood Vulnerable Clusters (which means there are flood risks in these areas), and can be categorized as medium or high erosion sensitivity.

3.1 CONTEXT AND BACKGROUND

TRCA used the most recent available data and scientific methodologies to undertake watershed characterization. The complete Watershed Characterization Report is referenced in **Section 9 - References** and is publicly available on the project webpage.

The technical components outlined in **Table 2** were assessed as part of watershed characterization.

TABLE 2:
Summary of Technical Analyses for Watershed Characterization

Water Resource System	Natural Heritage System and Urban Forest
Involved the comprehensive delineation of the features and areas that comprise the WRS. Additionally, assessments of the condition and health of riparian corridors, fish and benthic communities, groundwater, streamflow, and aquatic habitat were undertaken. The presence of in-stream barriers was also characterized.	Involved the comprehensive delineation of the features and areas that comprise the NHS and urban forest. Habitat quantity, quality, terrestrial biodiversity, habitat connectivity, and climate vulnerabilities were assessed for the NHS. The amount of tree canopy, its composition, diversity, and health were assessed for the urban forest.
Water Quality	**Natural Hazards**
Involved the assessment of surface water quality parameters of concern and trends over time, as well as chemicals of emerging concern, microplastics, and spills.	Involved the characterization of flood and erosion risk in the watershed.

In addition to the technical components outlined in **Table 2**, watershed characterization also included the following technical analyses:

- **Stormwater management** - including an assessment of the proportion of the watershed with various levels of stormwater control (e.g. quantity or quality control).
- **Restoration planning** - including an assessment of completed restoration projects in the watershed and refinement of existing restoration opportunities.

Biodiversity

The term biodiversity describes the wide variety of living organisms that inhabit the earth. Biodiversity is an indicator of ecosystem health and helps ensure that ecosystems are functioning and providing valuable ecosystem services for human health and well-being.

Natural landscapes within the Etobicoke Creek watershed provide habitat for numerous species, which use these areas for breeding, feeding, roosting, and migrating. Based on limited inventory surveys conducted between 2010 and 2019, there are 139 fauna (i.e. animal) species (likely an underestimation of the actual number of fauna species) and 40 fish species found within the watershed. This shows that the watershed is capable of supporting a variety of species, though the presence of sensitive species is primarily outside of the urban areas. Improvements to habitat quantity, quality, and connectivity would benefit these species throughout the watershed.

Some of the sensitive species present in the Etobicoke Creek watershed include Butternut (*Juglans cinerea*; threatened species in Ontario), Little Brown Myotis (*Myotis lucifugus*; endangered species in Ontario), American Eel (*Anguilla rostrata*; endangered species in Ontario; located at the mouth of Etobicoke Creek only), Bobolink (*Dolichonyx oryzivorus*; endangered species in Ontario), Snapping Turtle (*Chelydra serpentina*; special concern species in Ontario), and Pitcher-plant (*Sarracenia purpurea*; species of regional concern).

Little Brown Myotis *(Myotis lucifugus)*

Pitcher-plant *(Sarracenia purpurea)*

3.2 HISTORICAL AND CURRENT LAND USES

The Etobicoke Creek watershed is heavily urbanized, resulting in low amounts of natural and rural land cover. **Table 3** illustrates land use change in the watershed from 2002 to 2019 for three generalized land use classifications: urban, rural, and natural. The amount of impervious cover (i.e. hard surfaces that prevent precipitation from penetrating the ground) was also calculated for these time periods.

TABLE 3:
Land Use Change

	2002 (area% and ha)	2012 (area% and ha)	2002 – 2012 (% change)	2019 (area% and ha)	2012 – 2019 (% change)
URBAN	53% (11,969 ha)	56% (12,636 ha)	**+6%**	60% (13,222 ha)	**+5.4%**
RURAL*	33% (7280 ha)	31% (6916 ha)	**-5%**	28% (6328 ha)	**-9%**
NATURAL	14% (3156 ha)	13% (2853 ha)	**-10%**	12% (2755 ha)	**-3%**
IMPERVIOUS COVER (i.e. hard surfaces)	43% (9765 ha)	46% (10,374 ha)	**+6%**	48% (10,856 ha)	**+5%**

*Rural includes land use classifications such as agriculture, golf courses, open space, hydro corridors, etc. These types of land uses cannot be considered natural, nor can they be considered urban as they have low amounts of impervious surfaces.

3.3 CURRENT STATE OF THE WATERSHED

Based on the watershed characterization technical analyses conducted (discussed in **Subsection 3.1 - Context and Background**), there are four key issues in the Etobicoke Creek watershed:

1 WATER RESOURCE SYSTEM:
aquatic habitat conditions are poor and the watershed has a high amount of runoff and in-stream barriers that affect aquatic ecosystem health.

Among larger watersheds in TRCA's jurisdiction (i.e. >200 km^2), Etobicoke Creek has the second highest annual runoff at 402 mm/year, second only to the Don River.

The average habitat rating for fish is 'fair' and for benthic communities is 'poor'.

There has been little to no change in aquatic habitat quality since 2002. It is important to note that the amount of impervious surfaces in a watershed impacts the natural flow regime of watercourses, water temperature, and water quality which subsequently impacts aquatic species and ecosystems through changes in aquatic habitat quality. Environment Canada provides recommendations on impervious cover percentages and has defined the quality of aquatic habitat based on the amount of impervious cover in a catchment area where 'sensitive' quality habitat occurs when there is 0-10% impervious cover, and declines in aquatic habitat quality are demonstrated when impervious cover is greater than 11% (with greater than 25% impervious cover being non-supporting) (Environment Canada 2013, Schueler 1994). Therefore, to minimize impacts to aquatic habitat health, it is recommended that the impervious cover percentage (effective impervious cover) remains below 25%. See **Appendix A** for more details.

Additionally, there are a large number of in-stream barriers that prevent the movement of species and only approximately 50% natural cover within the riparian corridor (i.e. within 30 metres of streams).

2 NATURAL HERITAGE SYSTEM AND URBAN FOREST:
there is a low amount of natural cover and habitat quality is generally 'poor'. The remaining natural cover is highly vulnerable to the effects of climate change.

Only approximately 12% of the watershed consists of natural cover, well below recommended targets (at least 30%) for long-term sustainability and resiliency.

There are some 'fair' quality habitat patches in the Headwaters, which support some sensitive plant and animal species.

Urban forest canopy cover (i.e. trees and tall shrubs) is approximately 15% and has remained stable from 2009 to 2018.

3 WATER QUALITY:
surface water quality is generally poor compared to other TRCA watersheds.

Contaminants of particular concern include chlorides (e.g. from road salts), phosphorus (e.g. from fertilizers), *E. coli* bacteria (e.g. from sewage and animal wastes), and metals such as copper and zinc (e.g. from industrial sources and / or roadways).

Exceedances of chlorides and nitrates were also observed in groundwater.

4 NATURAL HAZARDS:
the watershed has six Flood Vulnerable Clusters (FVCs) with a total area of 508 hectares (see **Figure 10**) and can be categorized as medium or high erosion sensitivity.

Table 4 provides a summary of certain watershed conditions and trends for each of these four key issues. Trends are assessed as changes from the baseline period (2002 – 2010) to current period (2011 – 2020). See the full Watershed Characterization Report and the online Etobicoke Creek Watershed Plan for more details and to explore some of the key characterization mapping layers.

TRCA's Watershed and Ecosystems Reporting Hub

TRCA's Watershed and Ecosystems Reporting Hub is another resource that provides interactive regional information about the watersheds (including the Etobicoke Creek watershed) and the waterfront in the Toronto region. The Reporting Hub identifies current conditions by theme and explains the importance of different environmental indicators for understanding watershed and ecosystem health. It also shows how conditions are changing over time and where we are relative to where we want to be. This helps to determine if watershed conditions are declining and what actions may be required to improve watershed health.

Difference between urban forest and natural cover

The term **urban forest** is used to describe the trees and woody shrubs located on all private and public property within a watershed, including urbanized spaces (i.e. along roads) and in forests. The percentage of urban forest cover is determined by the area covered by the canopies of all trees and shrubs in both built and natural areas.

Natural cover is the area of the watershed covered by natural habitats, including forests, meadows, and wetlands.

Natural cover includes habitats with varying amounts of trees and shrubs. Meadows for example are open habitats that do not contain trees. Although meadows are natural cover, they are not part of the urban forest. Conversely, the urban forest includes trees in built portions of the watershed that are not part of natural cover. For these reasons, the amount of natural cover and the amount of urban forest in a watershed will not be equal. Learn more about the differences between urban forest, natural cover, and forest cover here.

TABLE 4:
Summary of Watershed Characterization Results

	Current Conditions	Trend Assessment Between Baseline (2002 – 2010) and Current (2011 – 2020)
WATER RESOURCE SYSTEM		
Riparian Corridors	50% natural cover within corridor	Slight improvement (+1%)
Fish Community Health	Average IBI[1] Score: 22.7 (Fair)	No change
Benthic (e.g. insects, worms, molluscs) Community Health	Average FBI[2] Score: 6.57 (Poor)	No change
NATURAL HERITAGE SYSTEM / URBAN FOREST		
Habitat Quantity (i.e. total natural cover)	2,617 hectares 12% of watershed	Decrease (-14%)
Habitat Quality	Average LAM[3] Score: 7.51 (Poor)	No change
Urban Forest (i.e. canopy cover for the entire watershed)	3,290 hectares 15% of watershed	No change
Urban Forest Health (only in urbanized portions of the watershed, excludes agricultural areas)	Average condition is 80% (good) 20% are in poor or critical condition, dying or dead	Average condition declined by 4%, with the proportion of trees in poor condition or dead increased by 6%
WATER QUALITY		
Total Suspended Solids **(CWQG[4] = 30 mg/L)**	88% of samples met CWQG	Decrease (-6% or 6% fewer samples met objective in 2015-2019)
Chloride **(CWQG, chronic = 120 mg/L, acute = 640 mg/L)[5]**	7% of samples met chronic CWQG 70% of samples met acute CWQG	Decrease (-6%) for chronic Increase (+3%) for acute

[1]IBI stands for Index of Biotic Integrity and measures a set of metrics (number of fish species, presence of sensitive species, abundance, and food chain classifications) to assign a rating of very good (>38), good (28-37.9), fair (20-27.9), or poor (<20).

[2]FBI refers to Family Biotic Index, which is often used to assess the quality of water in rivers and has a rating scale of excellent (0-3.75), very good (3.76-4.25), good (4.26-5.0), fair (5.01-5.75), fairly poor (5.76-6.50), poor (6.51-7.25), or very poor (7.26-10).

[3]LAM, known as Landscape Analysis Model, combines the metrics of patch size (larger patches support larger populations), patch shape (habitat fragmentation), and matrix influence (influence of surrounding land uses) to determine an average score. LAM has a rating scale of excellent (13-15), good (11-12), fair (9-10), poor (6-8), or very poor (0-5).

[4]Canadian Water Quality Guidelines are federal water quality guidelines for various parameters. In healthy ecosystems, 100% of samples meet guidelines.

[5]Chronic refers to long-term exposure, compared to acute, which refers to short-term exposure.

	Current Conditions	Trend Assessment Between Baseline (2002 – 2010) and Current (2011 – 2020)
WATER QUALITY *(continued)*		
Total Phosphorus **(PWQO[6] = 30 ug/L)**	29% of samples met PWQO	Decrease (-2%)
Copper **(PWQO = 5 ug/L)**	72% of samples met PWQO	Decrease (-26%)
Zinc **(PWQO = 20 ug/L)**	78% of samples met PWQO	Decrease (-27%)
E. coli **(PWQO = 100 CFU / 100 mL)**	21% of samples met PWQO	Increase (+8%)
NATURAL HAZARDS		
Flooding (peak flows) **Based on 100-year[7] inflow at points for each of the six FVCs**	Brampton Central FVC = 78.8 m^3/s	Range from -1% to +7%[8]
	Avondale FVC, West Tributary = 23.5 m^3/s Avondale FVC, East Tributary = 29.8 m^3/s	Range from -0.4% to +1%[9] Range from +2% to +12%
	Little Etobicoke FVC = 37.1 m^3/s	Increase (+2%)
	Dixie / Dundas FVC = 106.9 m^3/s	Increase (+3%)
	Longbranch FVC = 359.0 m^3/s	Increase (+1%)

[6]Provincial Water Quality Objectives refer to provincial water quality standards for various parameters. In healthy ecosystems, 100% of samples meet objectives.

[7]100-year refers to a rainfall event that statistically has a one percent chance of occurring in any given year, at any given place. This does not mean it will only occur once every 100 years.

[8]The Brampton Central and Avondale FVCs are the furthest upstream and closest to the areas of urban expansion in recent years and thus more sensitive to flows, so the trend is reported as a range (best and worst case). All other FVCs are reported as a single percent change.

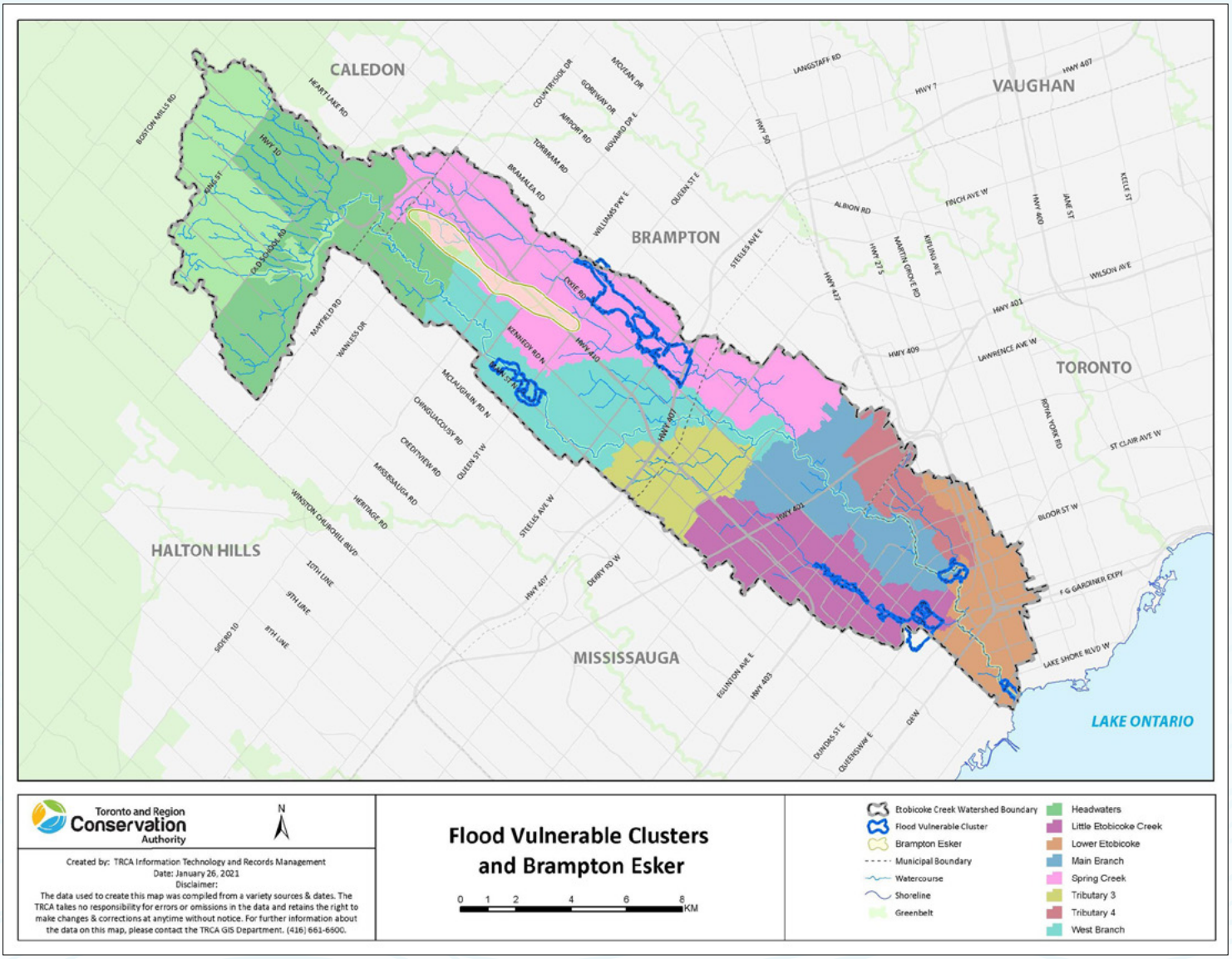
[9]See previous footnote.

	Current Conditions	Trend Assessment Between Baseline (2002 – 2010) and Current (2011 – 2020)
NATURAL HAZARDS *(continued)*		
Flooding (peak flows) **Based on 100-year[7] inflow at points for each of the six FVCs**	West Mall FVC, West Tributary = 304.7 m^3/s West Mall FVC, East Tributary = 36.5 m^3/s	Increase (+1%) Increase (+1%)
Erosion Sensitive Stream Reaches[10] **(35 stream reaches were assessed)**	22 'Highly' erosion sensitive stream reaches 12 'Moderately' erosion sensitive stream reaches	Increase (+8) 'Highly' erosion sensitive stream reaches Decrease (-8) 'Moderately' erosion sensitive stream reaches[11]

[10]Current conditions are based on erosion sensitivity for 2020, while the trend is compared to 2010.

[11]Two of the stream reaches for 2010 are categorized as both moderate and high erosion sensitivity, and are thus included as both high and moderate in these numbers.

FIGURE 10:
FVCs and Brampton Esker



Historical Watercourses

Urbanization has resulted in extensive watercourse burial and diversion of water flows into sewers leading to substantial changes to natural drainage patterns, and hydrological and ecological functions. When watercourses are connected to sewers, heavy rain can cause more flashy and immediate flooding, reduced water quality, and changes in the nutrient cycling processes of the watercourse.

The loss of natural watercourses in Toronto, including within the Etobicoke Creek watershed, began in the 18th century and accelerated with increased development during the 19th and 20th centuries. Extensive and well documented mapping work has been completed to identify the location of historical watercourses in Toronto, mainly by community organizations such as the Toronto Green Community's Lost Rivers group.

The Etobicoke Creek Watershed Plan does not assess the hydrologic or ecological impacts of burying these historical watercourses or provide advice on potential restoration opportunities. However, TRCA and the City of Toronto are exploring the feasibility of potential restoration opportunities for certain historical watercourses (including within the southern portion of the Etobicoke Creek watershed). This collaborative work will examine areas within the alignment of historical watercourses where hydrologic functions could be improved and natural cover could be increased. As well, TRCA and the City of Toronto are investigating potential ways to better highlight the natural, cultural, and historical significance of historical watercourses, including through signage and improved mapping.

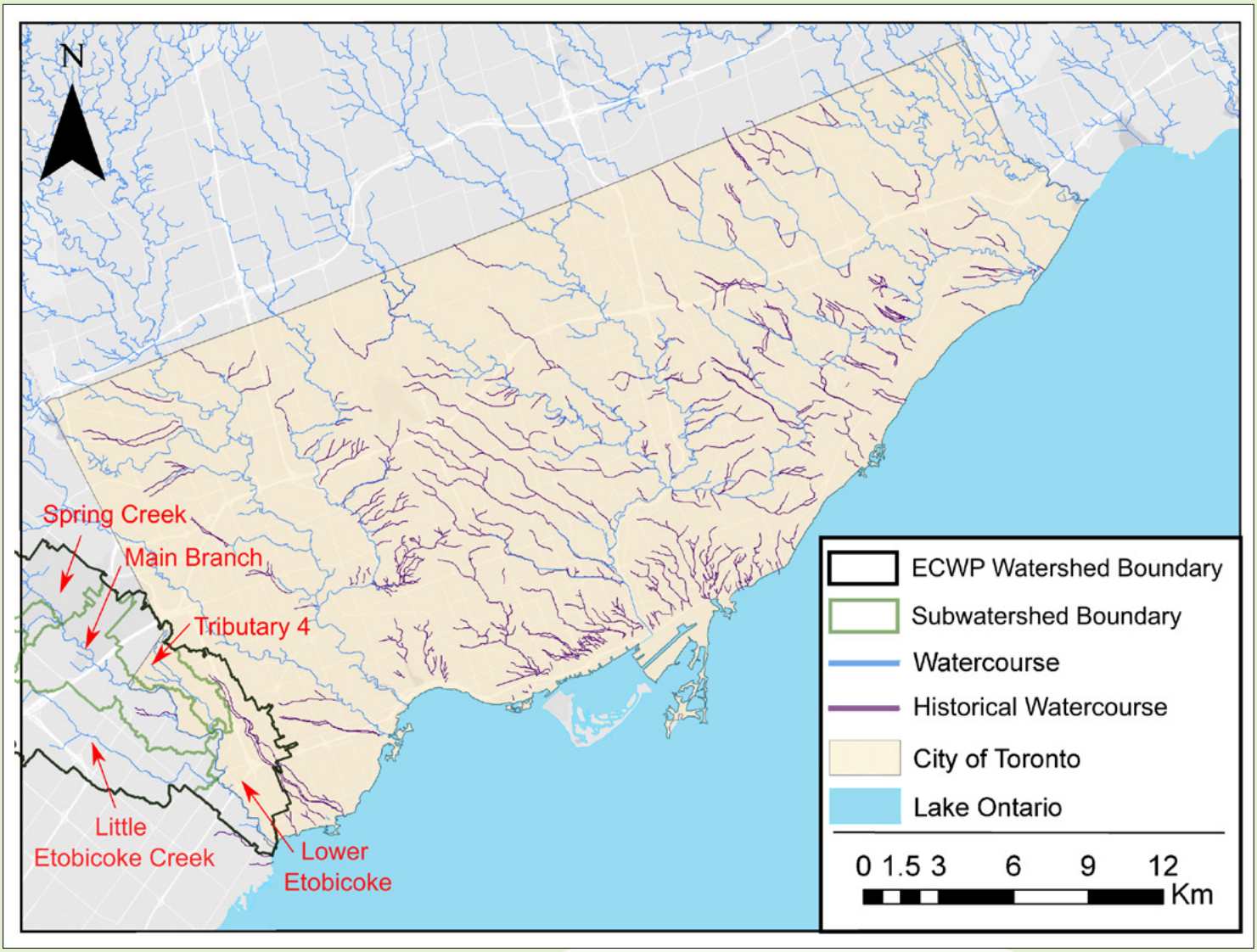


FIGURE 11:
Etobicoke Creek Just South of QEW

4. Future Watershed Conditions

Another important stage of the watershed planning process is assessing potential future conditions based on future land use scenarios and the impacts of climate change. The results of watershed characterization discussed in **Section 3 - Existing Watershed Conditions** informed the development of the future land use scenarios. An additional technical report documenting the results of the Future Management Scenario Analysis stage was produced, which is referenced in **Section 9 - References** and is publicly available on the project webpage.

Future Management Scenarios Analysis Key Messages (i.e. Future Conditions)

Future management scenario analysis is a technical exercise that involves assessing and comparing how different potential future land uses, climate changes, and varying levels of watershed enhancements/interventions may affect watershed conditions and overall watershed health. Scenario analysis is essentially a tool that can be used to compare the potential scenarios and does not constitute a land use decision, or a particular recommendation on land use patterns and specific management interventions. All of the scenario analysis information, along with the results of watershed characterization, were used to inform the development of the management framework described in **Section 5 - Management Framework**. A management framework and associated actions are needed to protect, enhance, and restore watershed health and ensure a more sustainable and resilient watershed.

For the Etobicoke Creek watershed, four different potential future management scenarios (described in **Table 5**) were assessed to help understand how each of the key watershed components (i.e. Water Resource System, Natural Heritage System and Urban Forest, Water Quality, and Natural Hazards) may respond in the future (i.e. will conditions improve, stay the same, or deteriorate). TRCA conducted extensive watershed modelling and performed technical analyses to assess the impacts of different levels of land uses, climate change (where possible), and watershed enhancements (e.g. improvements to natural cover, urban forest canopy, and stormwater management) on watershed health.

The scenario analysis results highlighted that, with changing land uses and climate, all four watershed components are negatively impacted, which affects overall watershed health. However, the watershed enhancements help mitigate these impacts and contribute to a safer, healthier, and more resilient watershed.

4.1 FUTURE STRESSORS

To determine appropriate future land use scenarios, it is necessary to identify potential future stressors on a watershed. For Etobicoke Creek, the high levels of urbanization and low amounts of natural cover are key determinants of watershed health. Due to growth pressures in Peel Region, further urbanization in the currently rural part of the Headwaters of the Etobicoke Creek watershed is expected.

Climate change is expected to increase precipitation, annual average temperatures, and the frequency of extreme weather events, which will add further strain on a watershed like Etobicoke Creek. There are already six FVCs in this watershed and significant erosion risk, which is likely to increase with more frequent and intense precipitation events without significant watershed interventions. The fragmented and low quality and quantity of natural cover decreases the likelihood of ecosystem resilience to extreme weather events.

Climate change and further urbanization in the Headwaters were factored into the future management scenario analysis, as much as possible, to determine how these key stressors will potentially impact watershed health. For example, the flood risk analysis and water quality analysis included climate projections into watershed modelling, while climate vulnerabilities and the thermal regime were incorporated into the terrestrial and aquatic impact assessments respectively.

The management framework for the watershed plan outlined in **Section 5 - Management Framework** recognizes these two future stressors and identifies management actions to minimize and mitigate the impacts of urban development, while protecting, enhancing, and restoring ecosystems to improve climate adaptation and ecosystem resilience.

4.2 FUTURE SCENARIOS

An effective way to assess how a watershed will respond to potential future change is to develop, analyze, and compare several possible future management scenarios, each reflecting a different composition of land uses and mitigation measures. As a result, future management scenario analysis is a tool to compare how possible future land uses might affect watershed health.

Future management scenario analysis is a technical exercise to ensure management actions are based on the best available science. The results of modelling and technical impact assessments helped to guide the development of the management framework in **Section 5 - Management Framework**, and will support municipalities in land use and infrastructure planning.

It is important to note that the future management scenarios analyzed are based on different potential future land uses only and do not represent specific municipal planning decisions or result in decisions about the type and configuration of land uses. In other words, **the scenarios do not constitute a land use decision, or a particular recommendation on land use patterns and specific management actions**. The aim was not to select one of these scenarios as the 'preferred scenario or approach' but, instead, the future management scenario analysis helped us understand how watershed conditions may change based on different potential future land uses (and varying amounts of urbanization), climate changes, and different levels of watershed enhancements/interventions.

For the Etobicoke Creek watershed, the future management scenarios were designed to:

- Project potential future land use change based on growth projections by examining different land use and infrastructure planning scenarios to 2051 (i.e. planning horizon for municipal Official Plans).
- Assess the effects of different levels of ecosystem restoration and enhancement (e.g. increase in natural cover quantity and quality) on watershed conditions.
- Assess the effects of different levels of stormwater control on watershed conditions.
- Assess the potential impacts of climate change on watershed conditions, where possible.

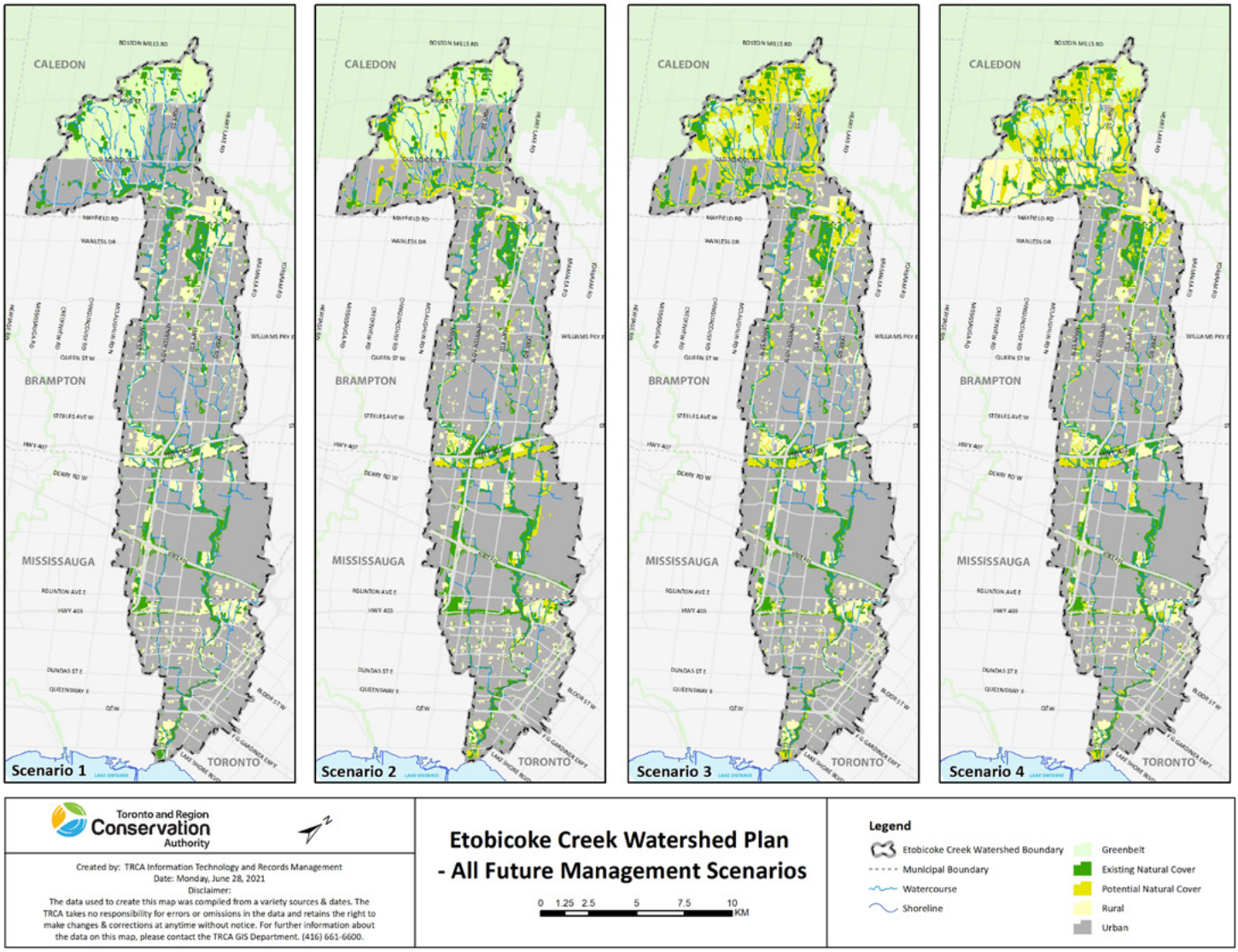
Four future management scenarios were assessed (see **Figure 12**). The baseline for comparison is the current conditions of the watershed as identified in **Section 3 - Existing Watershed Conditions**. **Table 5** provides a description and rationale for each of the four future management scenarios.

TABLE 5:
Summary of Future Management Scenarios

	Description	Rationale
Scenario 1: **Urban Expansion with Minimal Enhancements**	Assumes urbanization of the remaining whitebelt* lands in the Headwaters. No enhancements to natural cover or stormwater management.	Compares current conditions to further urbanization in the Headwaters with minimal other watershed enhancements.
Scenario 2: **Urban Expansion with Mid-range Enhancements**	Same as Scenario 1, with some enhancements to stormwater management, urban forest, and natural cover. Includes the potential Greater Toronto Area West Highway (i.e. Highway 413).	Compares additional watershed interventions to Scenario 1 to determine the relative benefits of the enhancements.
Scenario 3: **Urban Expansion with Optimal Enhancements**	Same as Scenario 1, with a greater level of enhancements to stormwater management, urban forest, and natural cover than Scenario 2.	Compares an even higher level of watershed interventions to Scenario 1 to determine the relative benefits of the enhancements.
Scenario 4: **Existing Urban Boundary with Optimal Enhancements**	Same as Scenario 3, except the current urban boundary is maintained in the Headwaters.	Compares the same high level of interventions as Scenario 3 without further urbanization to determine the relative benefits of the enhancements and maintaining the existing urban boundary.

***Note:**
The whitebelt refers to lands between the built boundary of urban settlement areas and the boundary of the Greenbelt Plan Area.

FIGURE 12:
Future Management Scenarios



At the time that the future management scenarios were developed and analyzed, many municipalities were in the process of updating their Official Plans, thus mapping (including the projected urban boundaries) may differ from mapping in municipal Official Plans. However, these differences are not expected to change the key messages of the analyses, which still provide useful insights to inform decision-making.

See the full Future Management Scenario Analysis technical report for more information on the assumptions that went into each scenario.

4.3 SCENARIO ANALYSIS

The key findings of the Etobicoke Creek watershed future management scenario analyses are organized into four watershed components: WRS, NHS and Urban Forest, Water Quality, and Natural Hazards. **Table 6** provides further details on potential future watershed conditions associated with each future management scenario for each of these watershed components. Potential future conditions are expressed by percent change for each component.

For all the calculations of percent change, Scenario 1 is compared to current conditions, while Scenarios 2, 3, and 4 are compared to Scenario 1. This is to compare and assess the relative benefits of the different levels of enhancements in Scenarios 2, 3, and 4 against the minimal enhancements in Scenario 1. To aid in interpreting the results in **Table 6**, percent change is colour-coded to indicate whether watershed conditions improve, are roughly equal, deteriorate, or significantly deteriorate from a hydrological or ecological perspective.

- **>+5% change**, watershed conditions improve
- **0 to +5% or 0 to –5% change**, watershed conditions stay roughly the same
- **-6% to –10% change**, watershed conditions deteriorate
- **>-10% change**, watershed conditions significantly deteriorate

It is important to note that percent change is identified by the thresholds listed solely based on watershed conditions and not whether the report value is a positive or negative number. For example, a decrease in chloride concentrations or peak flows is a good thing from a hydrological or ecological perspective and would be presented as a positive percent change in **Table 6**.

As noted earlier, future management scenario analysis does not result in decisions about the type and configuration of land uses. Instead, future management scenario analysis helps to inform decisions through the municipal planning process.

It is the responsibility of the applicable municipality to determine the ultimate land use configuration for any future changes in the watershed.

Appropriate mitigation strategies are developed during the detailed planning strategies for new developments. These mitigation strategies may include assessments on the appropriate levels of stormwater controls, the use of green infrastructure, and opportunities for ecological restoration.

TABLE 6:
Summary of Future Management Scenario Results

WATER RESOURCE SYSTEM

Watershed Plan Component		CURRENT CONDITIONS (2019)	SCENARIO 1 Urban Expansion + Minimal Enhancements (compared to Current Conditions)	SCENARIO 2 Urban Expansion + Mid-range Enhancements (compared to Scenario 1)	SCENARIO 3 Urban Expansion + Optimal Enhancements (compared to Scenario 1)	SCENARIO 4 Existing Urban Boundary + Optimal Enhancements (compared to Scenario 1)
WATER RESOURCE SYSTEM						
Riparian Corridors	Area (ha)	600	600	758	797	797
	% change	**N/A**	**0%**	**26%**	**33%**	**33%**
Aquatic Habitat Quality[12]	Area (ha)	10,719	11,663	11,531	11,220	10,538
	% change	**N/A**	**-9%**	**1%**	**4%**	**10%**
Groundwater recharge[13]	mm/yr	133	119	124	128	138
	% change	**N/A**	**-11%**	**4%**	**8%**	**16%**
Groundwater discharge[14]	mm/yr	118	107	111	114	122
	% change	**N/A**	**-9%**	**4%**	**7%**	**14%**

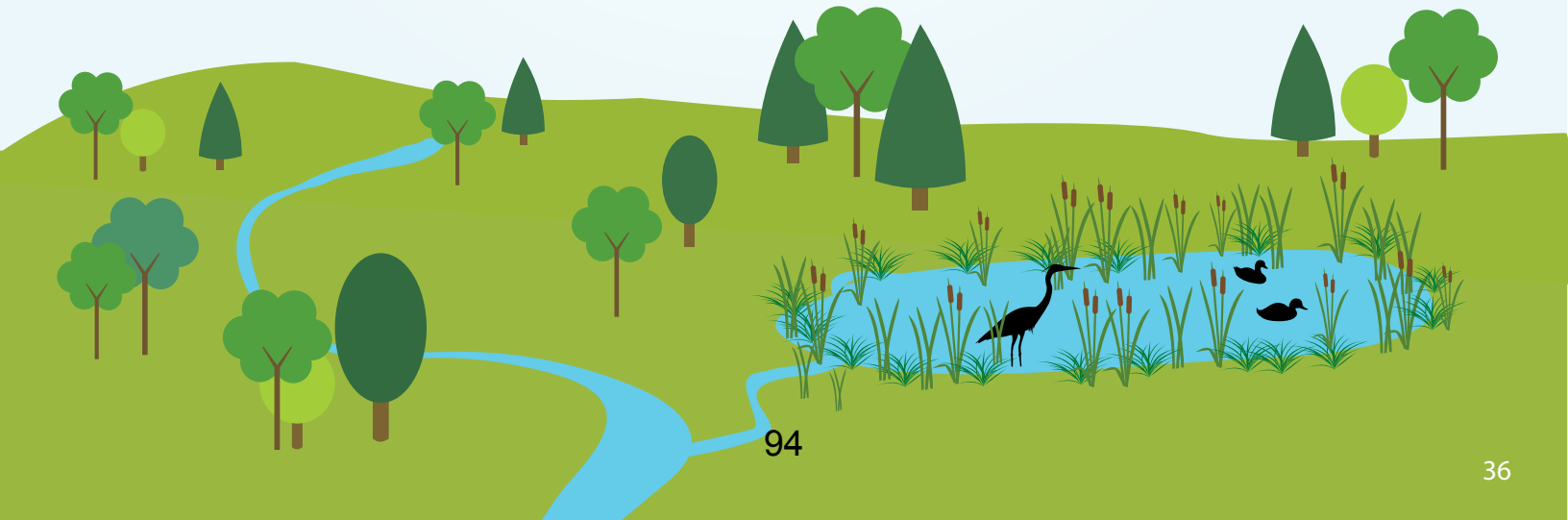
[12]This is based on the amount of impervious cover in the watershed as a metric of aquatic habitat quality. Aquatic habitat quality is expected to decrease as impervious cover increases (and it is recommended that effective impervious cover remains below 25%).

[13]The current conditions results for groundwater recharge are based on the model results from the future management scenario analysis rather than baseflow analysis completed during watershed characterization.

[14]See footnote 13.

NATURAL HERITAGE SYSTEM / URBAN FOREST

Watershed Plan Component		CURRENT CONDITIONS (2019)	SCENARIO 1 Urban Expansion + Minimal Enhancements (compared to Current Conditions)	SCENARIO 2 Urban Expansion + Mid-range Enhancements (compared to Scenario 1)	SCENARIO 3 Urban Expansion + Optimal Enhancements (compared to Scenario 1)	SCENARIO 4 Existing Urban Boundary + Optimal Enhancements (compared to Scenario 1)
NATURAL HERITAGE SYSTEM / URBAN FOREST						
Habitat quantity (natural cover)	Area (ha)	2,617	2,617	4,153	5,108	5,108
	% change	**N/A**	**0%**	**59%**	**95%**	**95%**
Habitat Quality	Average LAM score	7.56	7.33	7.47	7.74	7.91
	% change	**N/A**	**-3%**	**2%**	**6%**	**8%**
Urban forest (canopy cover)	Area (ha)	3,290	3,290	4,338	5,947	5,984
	% change	**N/A**	**0%**	**32%**	**81%**	**82%**



WATER QUALITY

Watershed Plan Component		CURRENT CONDITIONS (2019)	SCENARIO 1 Urban Expansion + Minimal Enhancements (compared to Current Conditions)	SCENARIO 2 Urban Expansion + Mid-range Enhancements (compared to Scenario 1)	SCENARIO 3 Urban Expansion + Optimal Enhancements (compared to Scenario 1)	SCENARIO 4 Existing Urban Boundary + Optimal Enhancements (compared to Scenario 1)
WATER QUALITY[15]						
Chlorides[16]	% change	N/A[17]	30%	-49%	-3%	-6%
TSS	% change	N/A[17]	-21%	68%	135%	186%

[15]Percent change for water quality is based on averages for all stream segments. Results for chlorides are presented as winter season only, while TSS results are for all seasons.

[16]Based on modelling results, average chloride concentrations decreased overall under all future management scenarios. However, the magnitude of the decrease was variable, especially in the winter season. In Scenario 1, chloride concentrations decreased from current conditions (percent change by 30%) reflecting positive watershed conditions despite urbanization. This is largely due to implications of climate change that result in reduced salt use. In Scenario 2, chloride concentrations were higher than Scenario 1 due to the proposed GTA West Highway and the additional expected road salting in winter months. Lastly, Scenarios 3 and 4 had similar (but slightly greater) chloride concentrations than Scenario 1 again suggesting that changes in urbanization and enhancements had less of an impact compared to climate change implications resulting in reduced salt use. Please see the Etobicoke Creek Watershed Future Management Scenario Analysis technical report (referenced in Section 9 and publicly available) for more details on the water quality results. It is important to note that, although climate change seems to be driving a decrease in chloride concentrations in the watershed, concentrations are already high, affecting aquatic life.

[17]Due to the partially calibrated nature of the water quality model, absolute concentrations are not being reported. Instead, percent change observed in the model is reported for the future scenarios, with Scenario 1 still being compared to current conditions.

NATURAL HAZARDS - FLOODING

Watershed Plan Component		CURRENT CONDITIONS (2019)	SCENARIO 1 Urban Expansion + Minimal Enhancements (compared to Current Conditions)	SCENARIO 2 Urban Expansion + Mid-range Enhancements (compared to Scenario 1)	SCENARIO 3 Urban Expansion + Optimal Enhancements (compared to Scenario 1)	SCENARIO 4 Existing Urban Boundary + Optimal Enhancements (compared to Scenario 1)
NATURAL HAZARDS - FLOODING[18]						
Flood risk (100-year storm at Dixie/Dundas FVC without climate change)	Peak flow (m^3/s)	107	108	106	91	91
	% change	**N/A**	**-1%**	**3%**	**16%**	**16%**
Flood risk (100-year storm at Dixie/Dundas FVC with climate change)	Peak flow (m^3/s)	107	134	132	121	121
	% change	**N/A**	**-26%**	**1%**	**10%**	**10%**
Flood risk (5-year storm at Dixie/Dundas FVC without climate change)	Peak flow (m^3/s)	63	64	59	42	42
	% change	**N/A**	**-1%**	**8%**	**34%**	**34%**
Flood risk (5-year storm at Dixie/Dundas FVC with climate change)	Peak flow (m^3/s	63	68	64	47	47
	% change	**N/A**	**-9%**	**7%**	**31%**	**31%**

[18]See the full Future Management Scenario Analysis technical report for full flood and erosion risk results. For the purposes of this watershed plan, a sample from two design storms at one FVC is used to illustrate changes in flood risk associated with the future management scenarios. For erosion risk, the Headwaters and Lower Etobicoke subwatersheds are shown with results for Cumulative Effective Work and Time of Exceedance.

NATURAL HAZARDS - EROSION

Watershed Plan Component		CURRENT CONDITIONS (2019)	SCENARIO 1 Urban Expansion + Minimal Enhancements (compared to Current Conditions)	SCENARIO 2 Urban Expansion + Mid-range Enhancements (compared to Scenario 1)	SCENARIO 3 Urban Expansion + Optimal Enhancements (compared to Scenario 1)	SCENARIO 4 Existing Urban Boundary + Optimal Enhancements (compared to Scenario 1)
NATURAL HAZARDS - EROSION[18]						
Erosion risk based on Cumulative Effective Work Index[19] (CEW) in Headwaters	**% change**	**N/A[20]**	**-128%**	**18%**	**35%**	**58%**
Erosion risk based on CEW in Lower Etobicoke	**% change**	**N/A[21]**	**-13%**	**35%**	**48%**	**53%**
Erosion risk based on Time of Exceedance[22] (TOE) in Headwaters	**% change**	**N/A[23]**	**-104%**	**17%**	**32%**	**48%**
Erosion risk based on TOE in Lower Etobicoke	**% change**	**N/A[24]**	**-8%**	**36%**	**51%**	**54%**

[19]Cumulative Effective Work index, CEW, provides a measure of the energy expended by the channel above the threshold discharge, or critical shear stress value. Larger values of CEW imply greater potential for erosion of the channel material.

[20]The continuous erosion modelling conducted calculated CEW in Newtons/metre, but only the results as percent change for the future management scenarios are shown here.

[21]See footnote 20.

[22]Time of Exceedance, TOE, provides a measure of the total amount of time over which the threshold, or critical flow, is exceeded in the channel. Larger values of TOE imply a larger total time period during which the channel could erode.

[23]The continuous erosion modelling conducted calculated TOE in hours, but only the results as percent change for the future management scenarios are shown here.

[24]See footnote 23.

The following summary illustrates expected changes to watershed conditions based on available information and assessments conducted as part of this watershed planning process. The management framework in **Section 5 - Management Framework** identifies what is necessary to protect, enhance, and restore watershed conditions.

Summary of implications:

Water Resource System	• Aquatic habitat quality will decrease as impervious surface amounts increase (and will likely become non-supporting if effective impervious cover exceeds 25%). • With increasing urbanization, more sensitive fish species will be replaced with species more tolerant of disturbance, and benthic communities will shift towards more pollution tolerant species. • With natural cover enhancements, the number of coolwater, coldwater, and stable temperature stream reaches could increase and make the system more resilient to climate change. • Groundwater discharge and recharge will be negatively affected in the Headwaters without enhancements to natural cover, urban forest, stormwater management, and LID implementation.
Natural Heritage System and Urban Forest	• Even with optimal natural cover enhancements, this watershed remains below recommended federal guidelines for natural cover quantity and TRCA's terrestrial NHS target, but any increase will provide a benefit to biodiversity and other ecosystem services. • There are opportunities to increase the quantity and quality of the urban forest to provide ecosystem goods and services, increase climate resiliency, and provide socio-economic benefits.
Water Quality	• Changes in water quality parameters (e.g. TSS and chlorides) demonstrate the impact of urbanization and the benefits of improved stormwater management and natural cover enhancements in a changing climate.
Natural Hazards	• Optimal enhancements to natural cover and stormwater management help reduce peak flow levels, though not as effectively when climate change is factored in. • Land use changes can manage peak flows for all design storms through enhancements and interventions (if TRCA's stormwater management criteria for the Etobicoke Creek Headwaters is applied), but climate change will cause peak flows to exceed current stormwater infrastructure design standards. • Increasing enhancements to natural cover and stormwater management help mitigate erosion, which would otherwise increase with further urbanization.

What does this mean?

These results demonstrate the importance of ensuring that land use and infrastructure planning decisions are made to minimize and mitigate impacts to the watershed regardless of potential future land use configurations. The results also clearly demonstrate the benefits of increased watershed enhancements to the quantity of quality of natural cover and urban forest, improved stormwater management, and greater use of LID infrastructure.

The results of this future management scenario analysis emphasize the importance of protecting, enhancing, and restoring the WRS and NHS as identified in this watershed plan.

Climate change, combined with a heavily urbanized and already degraded watershed, has the potential to further reduce watershed health and increase the risk to watershed residents and infrastructure (i.e. through more frequent and intense flooding and erosion).

The management framework outlined in **Section 5 - Management Framework** is designed to address existing watershed issues and the implications of these future management scenarios by identifying actions to improve watershed conditions and increase resiliency to the impacts of climate change, by:

- Limiting impervious cover as much as possible, or mitigating it through the use of green infrastructure and LID.
- Increasing natural cover and improving terrestrial and aquatic habitat quality through targeted ecological restoration and urban forest canopy enhancements.
- Ensuring municipal policies and programs are in place to achieve best management practices and mitigate the impacts of urban development on watershed health.

FIGURE 13:
Etobicoke Creek Trail South of 401

5. Management Framework

The role of municipalities in watershed planning is to implement the watershed planning requirements/guidance of provincial legislation, plans, and the PPS. Watershed planning helps municipalities make informed decisions on where and how to grow in a way that minimizes and/or mitigates impacts to watershed health. Watershed plans can also be an excellent resource to municipalities to inform various initiatives including greenlands securement and management planning and green infrastructure and/or stormwater management retrofit planning, and to contribute to urban revitalization strategies where natural heritage restoration or flood remediation strategies may be needed.

The management framework for the Etobicoke Creek Watershed Plan represents what needs to be done to protect, enhance, and restore watershed health and build resiliency to land use and climate changes. Improving the health of the Etobicoke Creek watershed will have many co-benefits such as providing ecosystem services and improving community health and well-being.

The management framework consists of goals, objectives, indicators, and management actions (described in **Table 7**).

TABLE 7:
Management Framework Explanation

Management Framework Components	Description
GOALS	Represent the outcomes to achieve.
OBJECTIVES	Are the specific statements about desired results, or steps to be undertaken, to achieve the goal.
INDICATORS	Explain how progress on implementing the objectives is going to be tracked or measured.
MANAGEMENT ACTIONS	Specifically explain what needs to be done, and by what partner, to accomplish the relevant objective.

The management framework for the Etobicoke Creek Watershed Plan consists of three goals, eight objectives, 10 indicators, and 36 management actions (see **Figure 14**). The management framework was developed collaboratively by TRCA, the municipalities within the watershed, MCFN, and the GTAA, and based on feedback from stakeholders and the public to address the issues identified during the watershed characterization stage and to mitigate potential future stressors (i.e. urban expansion and climate change) as identified during the future management scenario analysis stage. Regardless of potential future land use, the management framework is designed to minimize and mitigate potential future watershed impacts.

Each of the goals in the management framework are complementary, with no one goal being more important than another. The management actions are numbered to correspond with their applicable goal and objective, and are also in no particular order. The management actions apply to the entire watershed, unless otherwise specified. For example, there are specific management actions for the Town of Caledon in the Headwaters subwatershed in the event of future urban expansion. The majority of the other management actions directed at municipal partners apply to areas of the watershed that already have urban land uses.

Additional detailed site-level investigations and technical studies will be required (as appropriate and as part of subwatershed planning, environmental assessments, development and planning applications/approvals, etc.). Further studies will provide local/site level information to help inform and assess the suitability for implementation of some of the management actions (e.g. stormwater controls and the use of low impact development and green infrastructure techniques based on site conditions).

To fully realize the vision for the Etobicoke Creek watershed and to improve watershed health and ensure sustainability of its ecosystem services for current and future generations, collaborative and comprehensive implementation of all aspects of this management framework is essential. Implementation of the management framework (and the specific management actions) will begin once final approvals and endorsements of the Etobicoke Creek Watershed Plan have been obtained from municipal committees and Councils and from TRCA's Board of Directors in 2024. **Section 6 - Implementation, Monitoring and Evaluation** provides additional details about implementation of the Etobicoke Creek Watershed Plan including establishment of an Implementation Steering Committee and development of a detailed implementation, tracking, and reporting plan to ensure TRCA and the municipalities in the watershed, in particular, are committed to and held accountable for implementation.

FIGURE 14:
Overview of Management Framework

GOAL 1

Land Use

Achieve sustainable land use and infrastructure development patterns to improve watershed conditions and enhance climate resiliency.

OBJECTIVE 1
Minimize the impacts of human land uses through the adoption and implementation of sustainability policies, low impact development (LID), and green infrastructure.

Indicator:
Complete LID or green infrastructure projects in the recommended areas that would benefit most from LID or green infrastructure implementation (**Map 1**).

OBJECTIVE 2
Retrofit, upgrade, and install stormwater infrastructure using best available technologies to reduce the impacts of untreated runoff entering receiving waters.

Indicator:
Evaluate improvements to stormwater management across the watershed through municipal tracking and reporting on stormwater assets, drainage areas (i.e. sewersheds), and service levels.

OBJECTIVE 3
Reduce the risks associated with natural hazards through enhanced flood and erosion mitigation.

Indicators:
Flooding: implement risk reduction measures in 50% of Flood Vulnerable Clusters.

Erosion: continue monitoring and remediating infrastructure hazard sites for participating municipal partners, implementing the assessment and maintenance of erosion control asset systems.

OBJECTIVE 4
Encourage the use of agricultural best management practices to minimize agricultural runoff and improve rural land stewardship.

Indicator:
Track the number of landowners that implement best management practices.

GOAL 2

Water Resource System

Protect, enhance, and restore the areas and features that comprise the Water Resource System (including aquatic habitat) for ecosystem resilience and sustainability.

OBJECTIVE 1
Implement appropriate policies and programs that identify, protect, enhance, and restore the areas and features that comprise the Water Resource System.

Indicator:
Complete restoration projects at 75% of identified priority aquatic sites (**Maps 3A and 3B**).

OBJECTIVE 2
Improve aquatic habitat connectivity and reduce the impacts of pollutants on aquatic health.

Indicator:
Maintain, or improve, aquatic health rankings.

GOAL 3

Natural Heritage System and Urban Forest

Protect, enhance, and restore the Natural Heritage System and urban forest within the watershed to improve ecosystem resilience and sustainability.

OBJECTIVE 1
Improve the quality and quantity of the Natural Heritage System through ecosystem and biodiversity protection, enhancement, and restoration.

Indicators:
Habitat Quantity: increase total natural cover in the watershed.

Habitat Quality: maintain, or improve, terrestrial ecosystem quality rankings.

OBJECTIVE 2
Increase urban forest canopy cover throughout the watershed to improve social and environmental well-being.

Indicator:
Increase canopy cover in the watershed to achieve a minimum target of 16%.

5.1 LAND USE GOAL

GOAL 1

Achieve sustainable land use and infrastructure development patterns to improve watershed conditions and enhance climate resiliency.

This goal focuses on the policy, land use, and infrastructure planning processes that influence the health of the watershed. Management actions (outlined in **Table 8**) focus on mitigating the impacts of current urban development or agricultural lands uses and minimizing future impacts from potential urban expansion. Due to the heavily urbanized nature of this watershed, utilizing the highest urban development standards, improving stormwater management, mitigating natural hazards, and improving agricultural land uses will be essential to ensure the long-term health of watershed ecosystems and to improve climate resiliency.

The decision of whether to proceed with the construction of Highway 413 rests with the Province. Some municipalities have expressed differing positions about the proposed Highway 413 with calls for the Province to consider alternatives. This watershed plan includes a management action (1.1.3) intended to mitigate watershed impacts, as much as possible, which is directed at the Ministry of Transportation should construction of Highway 413 proceed.

Land Use Objective	Management Actions
LAND USE OBJECTIVE 1 Minimize the impacts of human land uses through the adoption and implementation of sustainability policies, low impact development (LID), and green infrastructure.	**1.1.1** Municipal partners, in collaboration with TRCA, to adopt green development policies, or standards, requiring new developments and redevelopments, to utilize low impact development and green infrastructure techniques to limit the impacts of impervious cover and maintain predevelopment water balance consistent with or exceeding provincial standards or guidance. Understanding that the provincial guidance has not yet been finalized, the current recommendation is: a. through the control hierarchy of: i. retention (i.e. infiltration, reuse, or evapotranspiration) ii. LID volume capture and release (i.e. LID filtration) iii. stormwater volume detention and release (only once maximum control from steps i and ii have been exhausted) b. shall strive to meet the hydrology model recommended watershed runoff volume control target of the 90th percentile of a 12-hour event, where rainfall depth is approximately 27-29 mm c. shall adhere to best practices and standards for water quality, erosion, and sediment control
	1.1.2 Municipal partners, in collaboration with TRCA, to review and update existing policies/Official Plans, bylaws, guidelines, standards, secondary plans, and master plans to: a. ensure consistency with the goals and objectives of this watershed plan b. ensure best practices are implemented and the highest standards applied across the watershed for matters related to: i. safeguarding against natural hazard risks ii. Water Resource System and Natural Heritage System protection, enhancement, and restoration iii. improving water quality and protecting water quantity for drinking water and ecological needs c. establish a policy evaluation process to assess the effectiveness of policy frameworks consistent with the monitoring of watershed and local trends (i.e. if indicators are not improving, what needs to be done?)
	1.1.3 Prior to the construction of Highway 413, if approved, the Ministry of Transportation should include in the design: a. appropriate mitigation measures to ensure the natural hazard risks of flooding and erosion will not increase or are managed in accordance with Provincial guidelines and policies and TRCA's Voluntary Project Review process b. appropriate mitigation measures to demonstrate how the Natural Heritage System and Water Resource System will be protected and restored, including ecosystem compensation (once the protection hierarchy of avoid, minimize, and mitigate has been applied) c. appropriate mitigation measures to maintain ecological function and wildlife connectivity

Land Use Objective	Management Actions
LAND USE OBJECTIVE 1 Minimize the impacts of human land uses through the adoption and implementation of sustainability policies, LID, and green infrastructure.	**1.1.4** Municipal partners, in collaboration with other levels of government and TRCA, to work to reduce the amount of chlorides entering the watershed by: a. continuing to implement best management practices for winter de-icing procedures on public property b. continuing education and outreach on salt management for private property
	1.1.5 TRCA, in collaboration with municipal partners, will: a. update relevant stormwater management criteria guidance (consistent with the provincial standards/guidelines) to focus on retention (infiltration and reuse) and filtration to minimize the impacts of new development through the use of LIDs and green infrastructure b. continue to advocate to the Province to update the stormwater volume control guidelines and regulatory framework at the local level
LAND USE OBJECTIVE 2 Retrofit, upgrade, and install stormwater infrastructure using best available technologies to reduce the impacts of untreated runoff entering receiving waters.	**1.2.1** Municipal partners, in collaboration with TRCA, to prioritize on-site control through LID or green infrastructure implementation as much as possible based on site conditions (see **Map 1** for areas in the watershed that would benefit the most from LID or green infrastructure implementation to help with natural/pre-development water balance) or as opportunities arise through municipal capital planning for linear projects (i.e. road improvements) or other initiatives (e.g. sustainable community retrofit projects such as TRCA's Sustainable Neighbourhood Action Program).
	1.2.2 Municipal partners, in collaboration with TRCA, through stormwater master planning to continue to: a. utilize best management practices for stormwater management and consistent design criteria to manage runoff quantity, quality, erosion, and water balance b. implement or continue to advance municipal stormwater cost recovery funding options (e.g. stormwater charges) to reduce effective impervious surfaces in the watershed c. examine opportunities to retrofit outdated stormwater infrastructure and install controls in areas without management through long-term planning and investment strategies (recommended target for watershed to be less than 25% effective impervious cover to minimize impacts to aquatic ecosystem health through the implementation of LIDs and green infrastructure) d. adaptively manage stormwater infrastructure through operation and maintenance schedules and procedures e. take a watershed approach to master planning by coordinating efforts and investment strategies with neighbouring watershed municipalities f. factor in the impacts of climate change on stormwater infrastructure

Land Use Objective	Management Actions
LAND USE OBJECTIVE 2 Retrofit, upgrade, and install stormwater infrastructure using best available technologies to reduce the impacts of untreated runoff entering receiving waters.	**1.2.3** For new developments, municipal partners to have regard for TRCA criteria that requires hydrologic analysis and erosion threshold assessments downstream of potential stormwater detention facilities (e.g. stormwater ponds) that need to demonstrate no negative, or adverse, downstream impacts, prior to municipal approvals.
	1.2.4 The Greater Toronto Airports Authority, in collaboration with TRCA, to implement appropriate stormwater management measures to improve the quality and quantity of stormwater from airport lands.
	1.2.5 Municipal partners, in collaboration with TRCA, to continue to advance stormwater infrastructure retrofit projects that minimize impacts to the NHS and are outside of the floodplain and identify opportunities for more natural infrastructure solutions.
LAND USE OBJECTIVE 3 Reduce the risks associated with natural hazards through enhanced flood and erosion mitigation.	**1.3.1** TRCA, in collaboration with municipal partners, will: a. focus first on Special Policy Areas to continue to characterize flood risk within Flood Vulnerable Clusters b. develop outreach initiatives to educate the public on roles and responsibilities when living in a flood risk area c. enhance flood forecasting and warning systems d. undertake detailed technical studies and Environmental Assessments e. support implementation of flood mitigation strategies in each Flood Vulnerable Cluster
	1.3.2 Municipal partners, in collaboration with TRCA, to implement appropriate flood mitigation measures at the six Flood Vulnerable Clusters as recommended in relevant studies and reports.
	1.3.3 During planning for transportation infrastructure improvement projects, or new crossings, the City of Toronto, Region of Peel, and lower-tier municipalities to implement best management practices for siting and design in accordance with TRCA's Valley and Stream Corridor Crossings Guideline, to facilitate hydraulic and hydrologic functions of crossings to avoid and / or mitigate flood risk, slope instability, and erosion risk.

Land Use Objective	Management Actions
LAND USE OBJECTIVE 3 Reduce the risks associated with natural hazards through enhanced flood and erosion mitigation.	**1.3.4** TRCA and municipal partners will continue to prioritize the maintenance of their respective erosion and flood control assets and the remediation of infrastructure hazard sites based on erosion and flood risk.
	1.3.5 TRCA will regularly collect Light Detection and Ranging (LiDAR) data (or data using other appropriate and available technology) to allow for robust geospatial analyses of significant terrain movement, and to monitor erosion hazards threatening essential infrastructure and degrading erosion control structures (TRCA assets), and will provide accurate base mapping for flood mapping and modelling projects.
LAND USE OBJECTIVE 4 Encourage the use of agricultural best management practices to minimize agricultural runoff and improve rural land stewardship.	**1.4.1** In collaboration with the agricultural community and provincial ministries, TRCA, the Region of Peel, City of Brampton, and Town of Caledon, to identify opportunities to expand best management practices that reduce agricultural runoff and improve water management, such as: a. using cover crops, and/or leaving crop residue b. adopting no till farm practices during the non-growing season c. conducting soil testing for nutrients and adjusting fertilizer application rates, if required
	1.4.2 In collaboration with the agricultural community, rural land owners, and provincial ministries, TRCA, the Region of Peel, City of Brampton, and Town of Caledon, to identify opportunities to improve rural land stewardship practices through: a. improving education and outreach about the benefits of utilizing best management practices to improve habitat (e.g. meadows for sensitive bird species) and how efforts can have mutual benefits towards agricultural practices (e.g. windrows, reduced erosion, pollinator habitat, etc.) b. incentivizing increased tree canopy and naturalized vegetation buffers between agricultural lands and natural and/or Water Resource System features and areas c. incentivizing the implementation of Environmental Farm Plans and other rural land stewardship programs (e.g. TRCA's Rural Clean Water Program)

5.2 WATER RESOURCE SYSTEM GOAL

GOAL 2

Protect, enhance, and restore the areas and features that comprise the Water Resource System (including aquatic habitat) for ecosystem resilience and sustainability.

This goal focuses on ensuring policies are in place for the long-term protection of the WRS, while implementing programs to enhance and restore aquatic habitat and riparian corridors. The WRS is presented in **Maps 2A** and **2B**. The areas and features that comprise the WRS are to be protected in accordance with the management actions outlined below, and municipal and provincial policies.

The WRS in the Etobicoke Creek watershed is currently stressed, with limited natural cover, poor water quality, and poor aquatic habitat conditions. Implementing the management actions in **Table 9** will be essential to enhancing the health of the WRS and adapting to climate change.

TABLE 9:
WRS Management Actions

WRS Objective	Management Actions
WRS OBJECTIVE 1 Implement appropriate policies and programs that identify, protect, enhance, and restore the areas and features that comprise the Water Resource System.	**2.1.1** The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, to ensure the protection of the Water Resource System (**Map 2A** and **Map 2B**) and its functions by: a. updating Official Plans and zoning bylaws to identify and protect the Water Resource System b. assessing existing standards, policies, and guidelines for land use and infrastructure development to ensure they reflect provincial policy direction to protect, enhance, and restore the quality and quantity of water c. avoiding development near key hydrologic features through the establishment of appropriate buffers d. requiring the implementation of appropriate mitigation measures where avoidance of key hydrologic areas is not possible, to maintain hydrologic functions
	2.1.2 The Town of Caledon, in collaboration with TRCA, to require Headwater Drainage Feature classification and relevant management approaches as per the Evaluation, Classification and Management of Headwater Drainage Features Guidelines, prior to planning approvals in the Headwaters subwatershed.

WRS Objective	Management Actions
WRS OBJECTIVE 1 Implement appropriate policies and programs that identify, protect, enhance, and restore the areas and features that comprise the Water Resource System.	**2.1.3** The Town of Caledon, in collaboration with the Region of Peel and TRCA, to establish policies to ensure that the Headwaters of Etobicoke Creek maintains less than 25% effective impervious cover (in accordance with **Appendix A**) as urbanization increases to minimize impacts to aquatic ecosystem health, and to demonstrate through a subwatershed plan (or equivalent), prior to the approvals of any secondary plans in the Headwaters, that: a. key hydrologic features will be protected and hydrologic functions maintained b. where avoidance of key hydrologic areas is not possible, appropriate mitigation measures are to be implemented to maintain downstream hydrologic functions c. there will be no negative or adverse downstream effects, such as increased flooding, erosion, or deteriorated water quality through a hydraulic analysis (to quantify and map depth and extent of impacts) and other relevant modelling
	2.1.4 TRCA, in collaboration with municipal partners, to prioritize the restoration of aquatic sites identified on **Map 3A** and **Map 3B**, which have been selected for contributing to the following: a. enhancing habitat quality and watershed connectivity b. enhancing natural cover within riparian corridors c. ensuring biodiversity persists d. improving watershed resiliency to climate change **Note**: Municipalities may have their own restoration priorities (outlined in various municipal strategies and park plans) in addition to these priority restoration sites. This watershed plan encourages restoring as much habitat as possible across the watershed.
	2.1.5 The City of Brampton to ensure development applications for high density on the Brampton Esker (**Map 4**) include a hydrogeological study to confirm foundation stability and groundwater control, prior to planning approvals.
	2.1.6 The City of Brampton and TRCA, in collaboration with the Region of Peel, to develop an alternative groundwater control strategy for the Highway 410/ Bovaird Drive area to prepare for the potential situation that dewatering by the Turnberry Golf Club ceases or becomes ineffective.

WRS Objective	Management Actions
WRS OBJECTIVE 2 Improve aquatic habitat connectivity and reduce the impacts of pollutants on aquatic health.	**2.2.1** TRCA, in collaboration with municipal partners and landowners, to remove the priority barriers to fish movement identified on **Map 5**.
	2.2.2 TRCA and municipal partners, in collaboration with industrial and commercial landowners and the province, to: a. identify high risk spill areas and implement effective spill prevention and contingency plans in accordance with provincial regulations b. educate commercial and industrial property owners on effective maintenance of oil and grit separators, and other pollution control infrastructure
	2.2.3 TRCA and municipal partners to participate in research initiatives to identify sources of microplastics and emerging chemicals of concern, and to work with other levels of government to manage and ideally remove these pollutants from the environment.

5.3 NATURAL HERITAGE SYSTEM AND URBAN FOREST GOAL

GOAL 3

Protect, enhance, and restore the Natural Heritage System and urban forest within the watershed to improve ecosystem resilience and sustainability.

This goal focuses on policies and programs to protect, enhance, and restore the quantity and quality of the NHS and urban forest within the watershed. The watershed refined enhanced NHS is shown in **Map 6** and the management actions are outlined in **Table 10**. The priority areas for urban forest canopy enhancements are shown in **Map 9**.

It is the responsibility of municipalities to adopt a NHS that is consistent with provincial policy and informed by the goals and objectives of the Etobicoke Creek Watershed Plan. The watershed refined enhanced NHS, developed as part of this watershed plan, includes areas with existing natural cover and areas that are targeted to be potential natural cover through restoration. It also includes contributing areas, which are built or unbuilt areas that can provide additional habitat and connectivity benefits through the use of green infrastructure.

Assuming that the potential natural cover areas are restored, the watershed refined enhanced NHS achieves approximately 23% natural cover across the watershed (up from approximately 12% currently). This is still below recommended guidelines (at least 30%) and the scientific literature for a sustainable and resilient system. However, given the heavily urbanized nature of this watershed, the watershed refined enhanced NHS represents a significant and realistic improvement that will have significant benefits for overall watershed health, biodiversity, and climate resiliency.

Urban forests provide valuable terrestrial habitat, help manage stormwater, provide clean air, and have other socio-economic benefits (e.g. regulating temperatures, improving personal well-being). Including the urban forest under this goal recognizes the integrated nature of natural areas and the ecological value of additional tree canopy in parks, on streets, or on private property. See **Appendix B** for more details on the tiered enhancement opportunities identified in the management actions related to urban forestry.

TABLE 10:
NHS and Urban Forest Management Actions

NHS and Urban Forest Objective	Management Actions
NHS AND URBAN FOREST OBJECTIVE 1 Improve the quality and quantity of the Natural Heritage System through ecosystem and biodiversity protection, enhancement, and restoration.	**3.1.1** Municipal partners, in collaboration with TRCA, to establish habitat targets through programs and policies to increase natural cover within the watershed as follows: a. increase forest cover to at least 14% of total watershed area b. increase wetland cover to at least 3% of total watershed area c. increase meadow cover to at least 5% of total watershed area
	3.1.2 The City of Toronto, Region of Peel, and lower-tier municipalities, to ensure the protection, enhancement, and restoration of a watershed refined enhanced Natural Heritage System consistent with the goals and objectives of this watershed plan (**Map 6**) by: a. designating in their Official Plans, at a minimum, existing natural cover as identified in **Map 6** b. including policies in their Official Plans to identify enhancement and restoration opportunities for potential natural cover areas as identified in **Map 6** c. assessing existing standards, guidelines, and policies for land use and infrastructure development to ensure they reflect best practices to maintain, restore, or enhance the designated Natural Heritage System d. avoiding infrastructure development (i.e. buildings and structures) and minimizing infrastructure linear feature crossings in a designated Natural Heritage System e. adopting municipal policies for ecosystem compensation that meet or exceed TRCA's Guideline for Determining Ecosystem Compensation, where development in a designated Natural Heritage System is unavoidable f. applying a minimum vegetation protection zone along natural heritage features at the boundary of a designated Natural Heritage System (a minimum 30 metre vegetation protection zone is recommended, unless otherwise determined through an appropriate environmental study or provincial policy) g. requiring development and site alterations be designed and approved to prevent encroachment into a designated Natural Heritage System.

NHS and Urban Forest Objective	Management Actions
NHS AND URBAN FOREST OBJECTIVE 1 Improve the quality and quantity of the Natural Heritage System through ecosystem and biodiversity protection, enhancement, and restoration.	**3.1.3** TRCA, in collaboration with municipal partners, and the Greater Toronto Airports Authority, to prioritize the restoration and enhancement of the terrestrial sites identified on **Map 3A** and **Map 3B** (while ensuring aviation safety), which have been selected for contributing to: a. increasing habitat quantity b. enhancing habitat quality and connectivity c. ensuring biodiversity persists d. reducing climate vulnerabilities **Note**: Municipalities may have their own restoration priorities (outlined in various municipal strategies and park plans) in addition to these priority restoration sites. This watershed plan encourages restoring as much habitat as possible across the watershed.
	3.1.4 TRCA, in collaboration with municipal partners, to explore opportunities to secure the sites identified on **Map 7** for ecological protection and to increase the public land ownership and connectivity within the watershed.
	3.1.5 All municipalities, in collaboration with TRCA and the Greater Toronto Airports Authority, are to expand the trail network in the Etobicoke Creek watershed to create a connected and safe active recreation network from Lake Ontario to the Headwaters and to neighbouring watersheds (based on TRCA's Trail Strategy for the Greater Toronto Region 2019, the Province-wide Cycling Network, and municipal trail and active transportation strategies) that minimizes potential impacts to the Natural Heritage System by: a. ensuring proper trail management and signage b. engaging trail users by providing education and outreach on the importance of the Natural Heritage System along the trail network c. promoting community stewardship to maintain and monitor the Natural Heritage System for improper trail usage (e.g. off-trail compaction and erosion), illegal dumping, and invasive species, while encouraging community restoration programs (e.g. tree plantings) d. collaborating, when possible, to manage problematic invasive species e. engaging with MCFN to develop interpretative trail signage on the importance of water and the relationship between Treaties and the Etobicoke Creek, and include appropriate Indigenous placemaking

NHS and Urban Forest Objective	Management Actions
NHS AND URBAN FOREST OBJECTIVE 1 Improve the quality and quantity of the Natural Heritage System through ecosystem and biodiversity protection, enhancement, and restoration.	**3.1.6** Municipal partners, in collaboration with TRCA, to improve wildlife passage at priority road crossings identified on **Map 8**.
	3.1.7 Municipal partners, in collaboration with TRCA, to include in green development standards or guidelines, urban design requirements to improve conditions for biodiversity and habitat, such as green roofs, bird safe windows, wildlife crossings, etc., especially within contributing areas of the Natural Heritage System.
NHS AND URBAN FOREST OBJECTIVE 2 Increase urban forest canopy cover throughout the watershed to improve social and environmental well-being.	**3.2.1** The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, will undertake strategic tree planting as per the priority planting areas identified on **Map 9** to achieve tree canopy cover targets for each subwatershed, or municipality, as follows: - Lower Etobicoke = 23.3% - Main Branch = 15% - West Branch = 19.6% - Tributary 3 = 12.2% - Tributary 4 = 14.7% - Little Etobicoke Creek = 15.1% - Spring Creek = 16% - Headwaters (Greenbelt portion) = 13.3% **City of Toronto = 24%** **City of Mississauga = 12.5%** **City of Brampton = 20%** **Town of Caledon = 11.3%** **Note:** See management action 3.2.2 for the non-Greenbelt portion of the Headwaters. Municipalities may have specific canopy cover targets that exceed these watershed targets. This watershed plan encourages achieving the highest possible amount of canopy cover across the watershed.
	3.2.2 The Town of Caledon, in collaboration with the Region of Peel, will require a minimum of 30% canopy cover target for any new developments in areas of the Headwaters subwatershed outside of the Greenbelt by: a. requiring developments to submit tree planting plans prior to planning approvals that are based on area specific data b. adopting tree preservation by-laws to retain mature trees c. ensuring green development standards contain progressive planting policies for all aspects of a development (e.g. right-of-ways, lots, parks, etc.).

NHS and Urban Forest Objective	Management Actions
NHS AND URBAN FOREST OBJECTIVE 2 Increase urban forest canopy cover throughout the watershed to improve social and environmental well-being.	**3.2.3** The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, will develop, or update, urban forest management plans or strategies that: a. enhance tree and soil conservation in accordance with Preserving and Restoring Healthy Soil: Best Practices for Urban Construction at all public and private property b. implement the tree canopy cover targets as identified in management action 3.2.1 by focusing planting in the priority areas identified on **Map 9** c. identify and promote opportunities for sustainable community retrofits (for example through TRCA's Sustainable Neighbourhood Action Program) in the priority areas identified on **Map 9** d. encourage an urban forest with diverse and native (or non-invasive) tree species and class sizes e. ensure consistent policies and bylaws for tree conservation on public and private lands f. develop, or expand, programs for native tree planting on public and private lands

FIGURE 15:
Etobicoke Creek at Centennial Park (Toronto)

6. Implementation, Monitoring and Evaluation

The following sections provide an overview of the process that will be used for implementation, tracking, and reporting of the Etobicoke Creek Watershed Plan, and provide information on the inventory, monitoring, and evaluation that will take place to continue to evaluate the health of the Etobicoke Creek watershed as well as the adaptive management plan.

6.1 IMPLEMENTATION, TRACKING AND REPORTING OF THE ETOBICOKE CREEK WATERSHED PLAN

The successful implementation of the Etobicoke Creek Watershed Plan will require the commitment, collaboration, support, and engagement of TRCA, the municipalities in the watershed, other partners, and watershed stakeholders/residents.

Once final approvals and endorsements of the Etobicoke Creek Watershed Plan have been obtained in 2024 from municipal committees and Councils and from TRCA's Board of Directors, implementation of the watershed plan will begin. The Etobicoke Creek Watershed Plan is intended to be in effect for 10 years from when it is finalized and approved. Collaborative and comprehensive implementation, tracking, and reporting of all aspects of the management framework outlined in **Section 5 - Management Framework** will be essential to fully realize the vision for the watershed and to improve watershed health and build resiliency to land use and climate changes.

An **Implementation Steering Committee** consisting of TRCA, the municipalities within the watershed, MCFN, and the GTAA will be established in 2024 to guide and support implementation and will be facilitated by TRCA. The Implementation Steering Committee will work together to create a detailed implementation, tracking, and reporting plan to ensure commitment to and accountability for implementation on the part of TRCA, our municipal partners, and other stakeholders. This will include:

- Identifying implementation timelines and clear responsibilities for each management action.
- Developing specific measures/metrics to track and report on implementation of each management action.
- Developing tracking and reporting mechanisms specific to the Etobicoke Creek Watershed Plan. This could include an interactive and user-friendly implementation and tracking platform to be developed by TRCA. This tool would track and report on implementation progress using dashboards, story maps, visual tools, etc.
- Identifying the resources required for implementation, including funding, to support actions such as restoration, in-stream barrier removal, and research/monitoring.
- Ensuring each Implementation Steering Committee member coordinates with their respective organizations to champion implementation of the Etobicoke Creek Watershed Plan including advocating for effective implementation and exploring opportunities for funding.

TRCA and our partner municipalities (along with a few other stakeholders) will play key roles in the implementation of the management actions. Although the Etobicoke Creek Watershed Plan will not make land use and infrastructure planning decisions, it is intended to inform municipal initiatives and processes. Many of the management actions will be implemented through municipal plans, processes, guidelines, and strategies such as Official Plans, Secondary Plans, zoning by-laws, subwatershed studies, stormwater master planning and stormwater control measures, best management practices, and urban forest and climate change strategies.

The Implementation Steering Committee will also establish mechanisms to continue to receive input from First Nations and Indigenous communities and from watershed stakeholders (including provincial partners, landowners, developers, agricultural organizations, NGOs), residents, and the public. The Implementation Steering Committee will provide updates on implementation progress and ways to participate and engage more directly in various implementation activities.

As part of the implementation of this watershed plan, TRCA and its partners will continue to conduct annual reporting on watershed health and plan implementation progress. Annual reporting through TRCA's Watershed and Ecosystems Reporting Hub will track watershed health trends through the inventory/monitoring discussed below and the indicators identified in **Section 5 - Management Framework**.

Some components of the watershed plan may not be reported on annually (e.g. aquatic and terrestrial), since stations are not inventoried/monitored annually.

Through the implementation of the Etobicoke Creek Watershed Plan, all watershed partners and stakeholders can contribute to a healthier, more sustainable, and more resilient watershed that can provide long-term benefits to all residents.

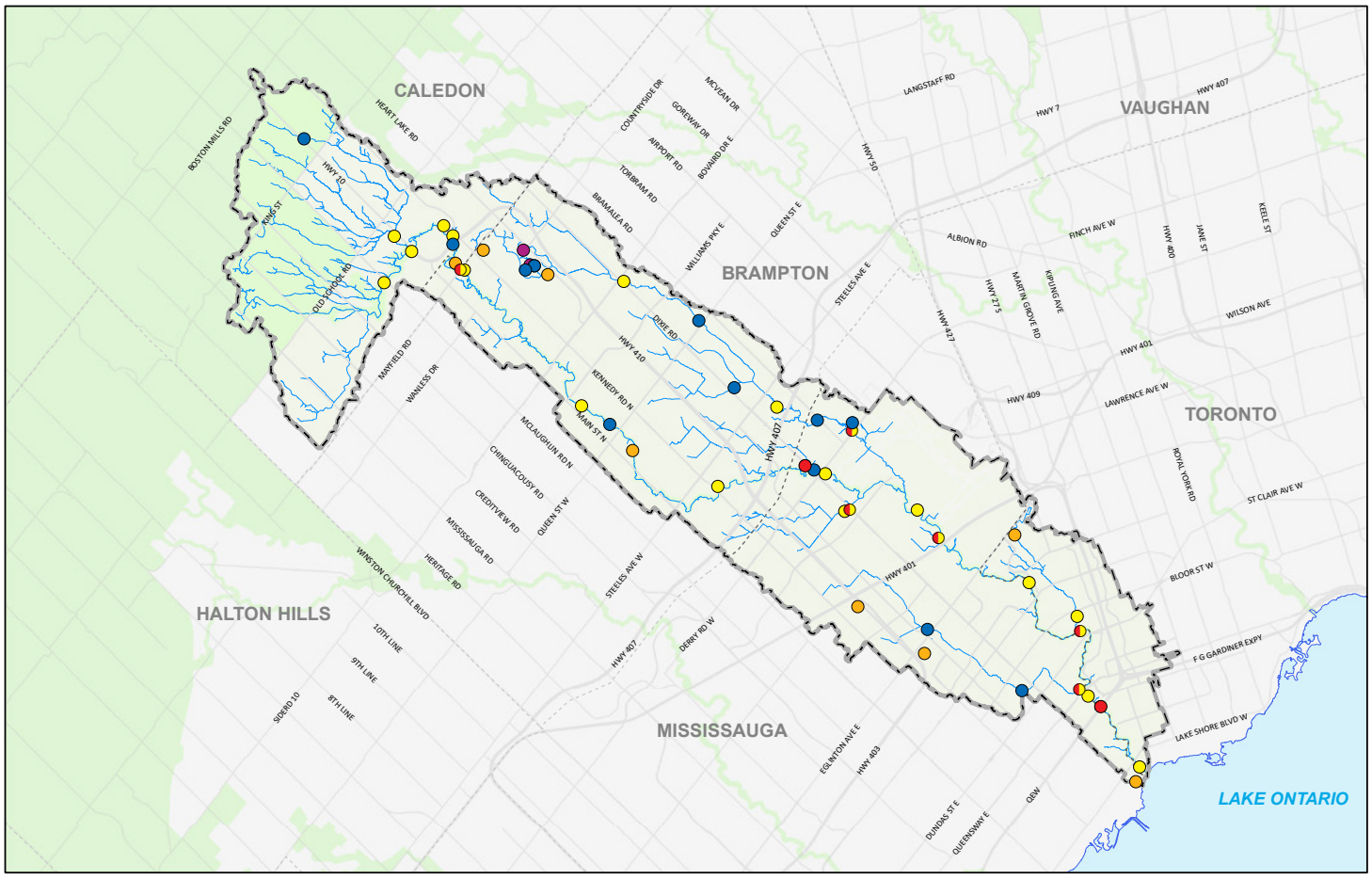
6.2 INVENTORY, MONITORING AND EVALUATION

Regular and ongoing inventory, monitoring, and research of watershed conditions (to be undertaken by TRCA with support from partner municipalities) will help assess trends and track implementation of this watershed plan. This will help determine what is working to maintain or improve conditions and what, if necessary, needs to change should conditions deteriorate.

Inventory and monitoring for the Etobicoke Creek watershed is designed to help evaluate watershed health and specific indicators associated with the objectives of this watershed plan.

The location of the various types of monitoring stations is identified on the map in **Figure 16**.

Table 11 identifies the monitoring frequency, what is monitored, and why monitoring is important for the various types of stations identified, and provides some information about the inventory work for the ECWP.



Toronto and Region Conservation Authority

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Created by: TRCA Information Technology and Records Management
Date: July 8, 2023
Disclaimer:
The data used to create this map was compiled from a variety sources & dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes & corrections at anytime without notice. For further information about the data on this map, please contact the TRCA GIS Department. (416) 661-6600.

Etobicoke Creek Watershed Plan: Monitoring Stations

0 1 2 4 6 8 KM

- Water Quality
- Water Quantity
- Water Quality / Aquatic
- Groundwater
- Aquatic
- Terrestrial
- Municipal Boundary
- Watercourse
- Shoreline
- Pearson Airport
- Greenbelt
- Etobicoke Creek Watershed Boundary

Note:
Inventory locations are not shown on this map as they will be determined on a yearly basis based on where data updates are required.

TABLE 11:
Monitoring / Inventory Program

Monitoring Station	Frequency	What is monitored?	Why do we monitor it?
WATER QUANTITY	Continuous measurement every 15 minutes for stream gauges and every 5 minutes for precipitation gauges	Stream level, discharge, and temperature, and/or rainfall/snowfall amount	Applicable to overall watershed health and trends to know whether hydrology conditions are improving or not. Water quantity monitoring supports flood plain mapping, flood forecasting and warning, low water response, and infrastructure design. Real-time precipitation and stream monitoring information supports timely flood messaging.
WATER QUALITY	Monthly samples and/or event-based samples (i.e. heavy rainfall)	Water chemistry (e.g. nutrients, metals, bacteria, etc.)	Applicable to overall watershed health and trends to know whether water quality conditions are improving or not. Monitoring water quality helps to understand the impacts of land uses on local water quality that ultimately flows into Lake Ontario.

Monitoring Station	Frequency	What is monitored?	Why do we monitor it?
GROUNDWATER	Hourly groundwater level and temperature, and quarterly manual groundwater level measurements, sampled annually for water quality	Water levels	Applicable to overall watershed health and trends to know whether hydrogeology conditions are improving or not. Groundwater and surface water interactions are essential for a functioning WRS. Understanding groundwater conditions is vital to understanding the nature of these interactions.
AQUATIC HEALTH	Every three years	Fish community, aquatic habitat, and benthic invertebrate community	Applicable to the health of the aquatic ecosystem.
TERRESTRIAL HEALTH	Annually	Vegetation and forest birds	Applicable to the health of the terrestrial ecosystem.

Note:
Inventory work is determined on a yearly basis based on where data updates are required, and can include vegetation community polygon mapping, flora and fauna species of concern mapping, and full species site lists.

6.3 ADAPTIVE MANAGEMENT

Adaptive management is a systematic process for continually improving practices by learning and applying updated knowledge to improve plan implementation (see **Figure 17**). In the context of this watershed plan, adaptive management, in conjunction with inventory, monitoring, and research programs, may lead to refinements of the management framework, or the number of monitoring stations, throughout the life of this watershed plan. For example, if water quality continues to deteriorate, management actions may need to be modified to focus on this particular issue.

FIGURE 17:
Adaptive Management Cycle

Wildlife Movement and Habitat Connectivity

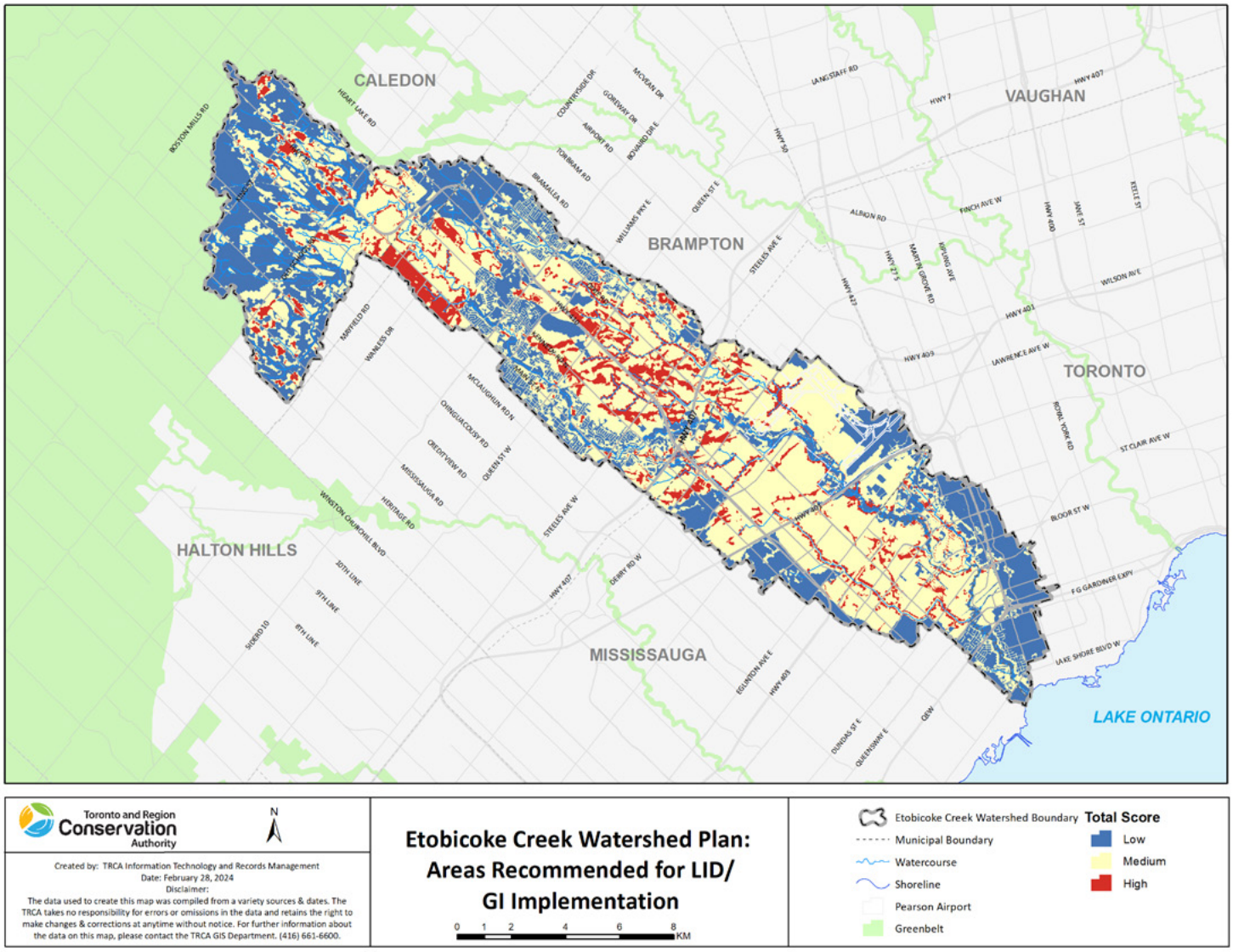
Many native wildlife species actively move between different habitats (forests and wetlands, for example) at different times of year for breeding, foraging, or hibernation. The Toronto region is expected to continue urbanizing as the population grows, necessitating further construction, expansion, and upgrading of roadways and railways. This transportation infrastructure reduces habitat size and severs the connections between different habitats, limiting the ability of species to safely access resources and leading to road mortality and/or population isolation.

An important aspect of TRCA's work is applied research on wildlife movement and habitat connectivity. One example of this is the work that was conducted along Heart Lake Road from Mayfield Road to Sandalwood Parkway in the City of Brampton within the Etobicoke Creek watershed. Through road ecology surveys conducted by TRCA, the City of Brampton, the Toronto Zoo's Ontario Road Ecology Group, and over 40 community volunteers, it was determined that portions of this roadway were hotspots for road mortality. This led to the installation of dedicated wildlife culverts under Heart Lake Road in 2016 and 2020 to allow safe passage for wildlife. To facilitate access to the passages, directional wildlife fencing has also been installed so wildlife is channeled towards the culvert. Turtle nesting habitats were also created to allow turtles, such as Snapping Turtle *(Chelydra serpentino*; special concern species in Ontario), to lay their eggs in a safe wetland environment.

FIGURE 18:
Before and After, Stream Restoration at Conservation Drive Park (Brampton)

7. Maps

The maps in this section, along with a map viewer showing many of the mapping layers, can be viewed in the online interactive Etobicoke Creek Watershed Plan here.



Map 1

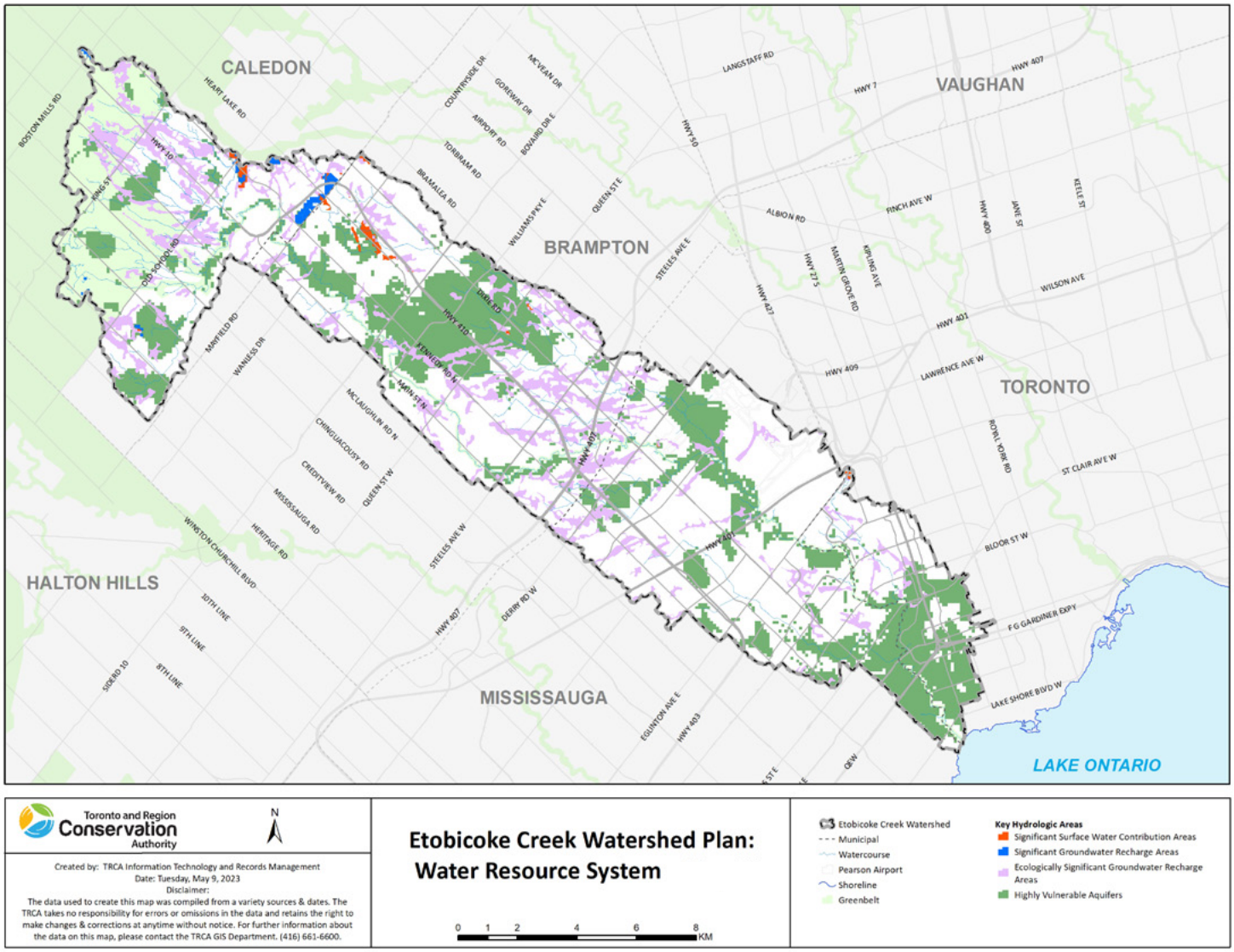
This map shows areas in the watershed that would benefit the most from low impact development (LID) or green infrastructure (GI) implementation to help regain natural or pre-development water balance. Areas in red are those that would benefit the most from the use of LID or green infrastructure implementation.

Appendix B contains information on how the areas were determined.

This map is meant to be used as a preliminary screening tool. Additional detailed site-level investigations and technical studies will be required to obtain local/site level information to help assess the suitability of the use of LIDs or green infrastructure in these areas based on site conditions.

MANAGEMENT ACTION

1.2.1 refers to this map.



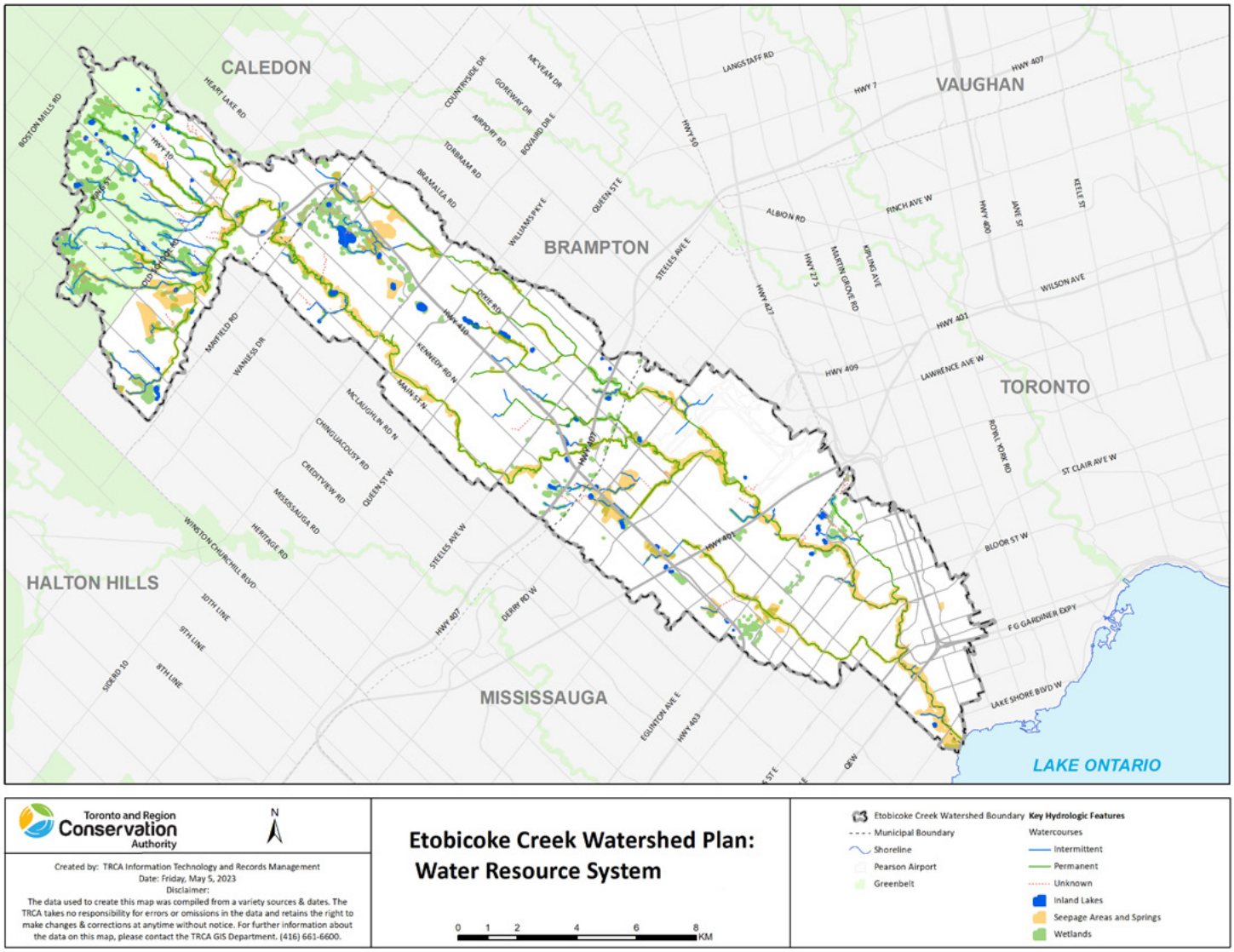
Map 2A

This map shows the Key Hydrologic Areas of the WRS. The WRS is essential for maintaining long-term ecosystem resilience and sustainability.

MANAGEMENT ACTION

2.1.1 refers to this map.

Map 2B shows the Key Hydrologic Features of the WRS.



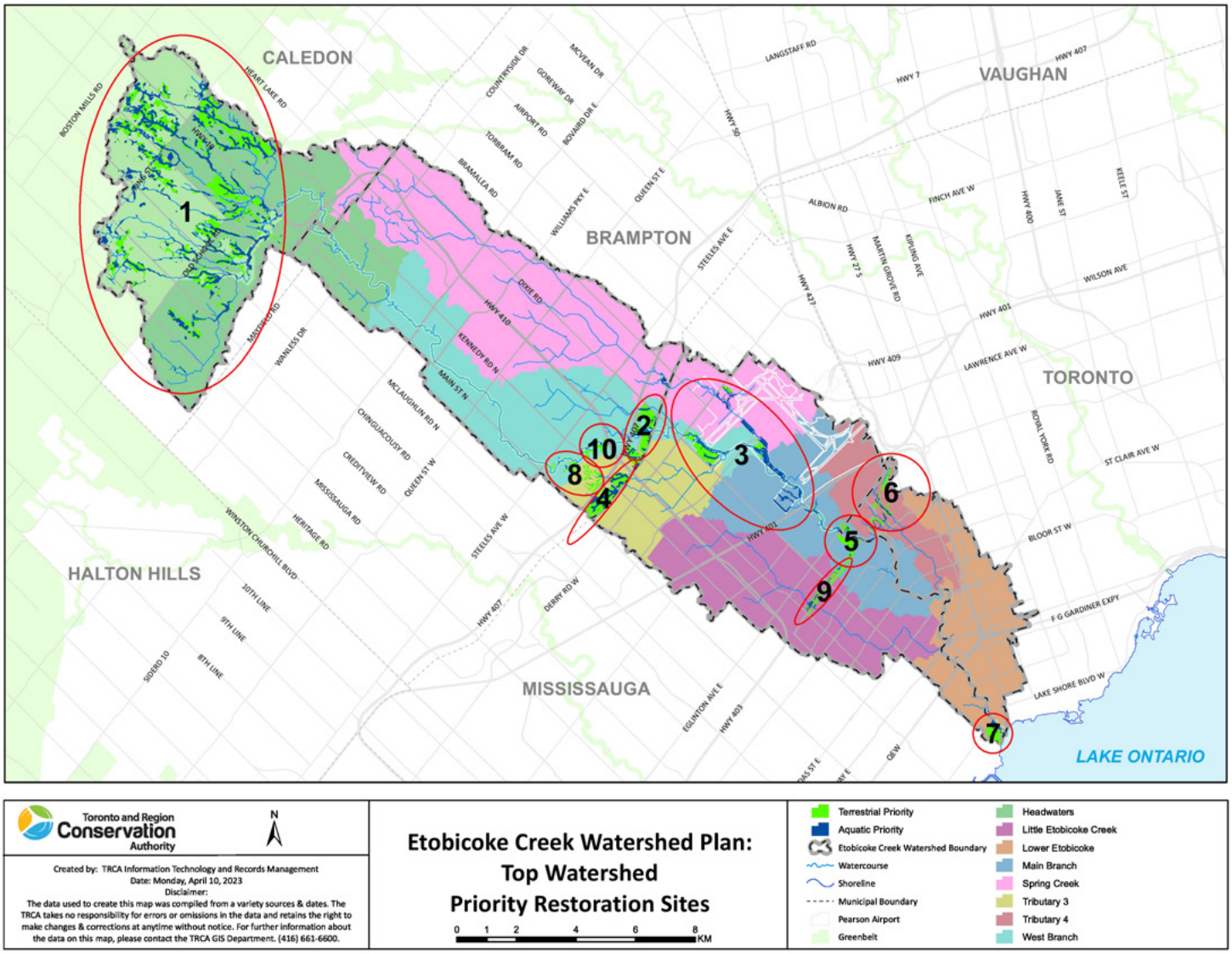
Map 2B

This map shows the Key Hydrologic Features of the WRS. The WRS is essential for maintaining long-term ecosystem resilience and sustainability.

MANAGEMENT ACTION

2.1.1 refers to this map.

Map 2A shows the Key Hydrologic Areas of the WRS.



Map 3A

This map shows the top 10 watershed priority restoration sites based on aquatic and terrestrial criteria and total size.

MANAGEMENT ACTIONS

2.1.4 and 3.1.3 refer to this map. See **Table 12** for more details on each priority site.

Appendix B contains information on how the priority restoration areas were determined.

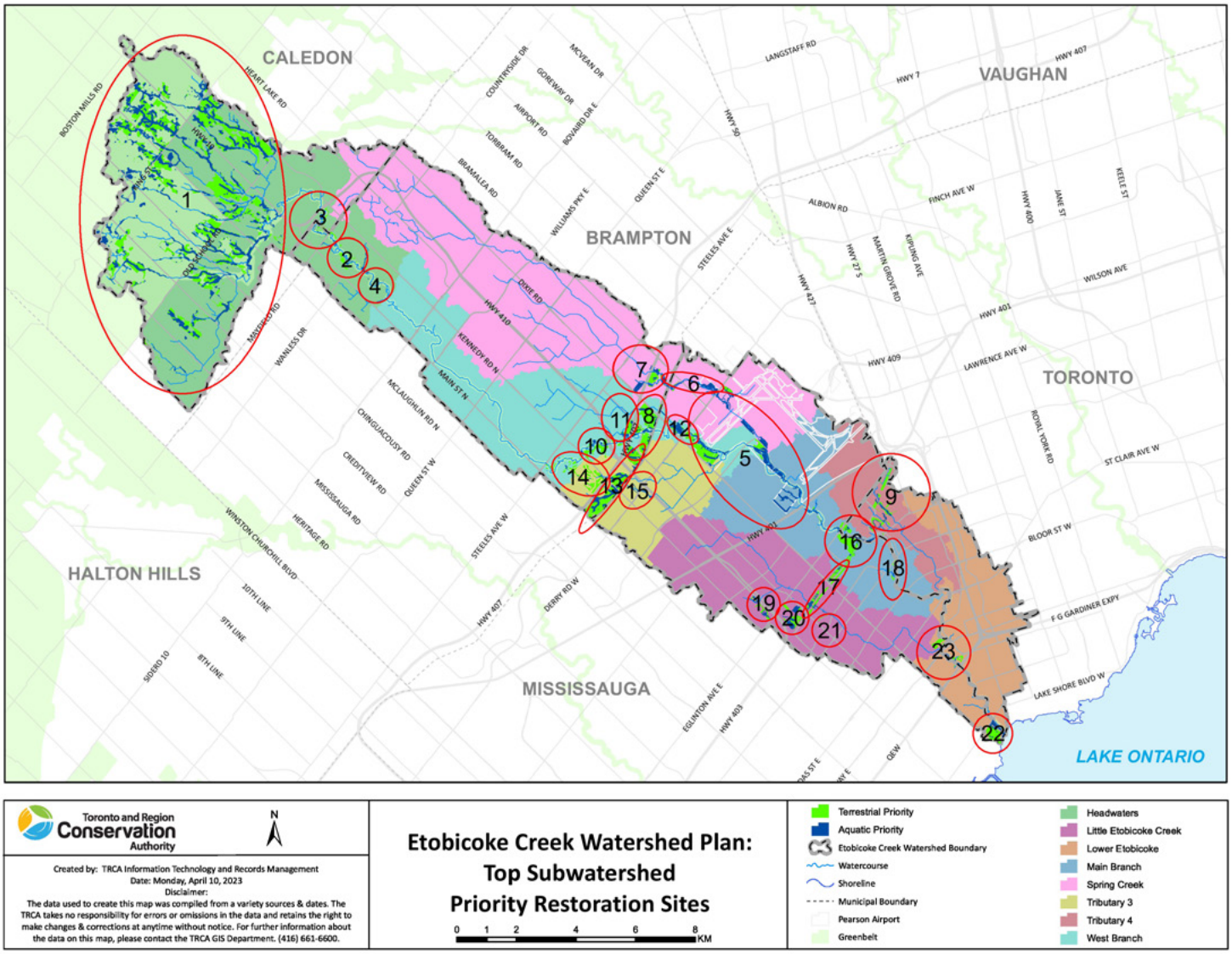
TABLE 12:
Top 10 Watershed Priority Restoration Sites

Name of Site (Subwatershed)	**Existing Natural Cover to Enhance** (in hectares)	**Potential Natural Cover to Restore** (in hectares)	**Total Size** (in hectares)	**By Habitat Type** (in hectares)
1. Headwaters 1* (Headwaters) Town of Caledon	130.2	550.4	680.6	Forest (357.2), Riparian (159.4), Wetland (164 ha)
2. Hwy 407 Hydro (East of 410) (Tributary 3 / West Branch / Spring Creek) City of Brampton	30.3	50.1	80.3	Forest (25.5), Meadow (34.1), Riparian (12.4), Wetland (8.3)
3. Pearson 1 (West Branch / Spring Creek / Main Branch) City of Mississauga	52.2	14.8	67.3	Forest (11.4), Riparian (50.8), Wetland 5.1)
4.Hwy 407 Hydro (West of 410) (Tributary 3) City of Brampton	9.2	57.0	66.1	Forest (10.0), Meadow (30.8), Riparian (20.0), Wetland (5.3)
5. Wood Creek (Main Branch) City of Mississauga	11.4	25.2	36.6	Forest (22.4), Meadow (5.9), Riparian (6.4), Wetland (1.8)
6. Centennial Park Etobicoke (Tributary 4) City of Toronto	2.3	22.7	25.1	Forest (8.2), Meadow (8.6), Riparian (3.8), Wetland (3.5)

Name of Site (Subwatershed)	**Existing Natural Cover to Enhance** (in hectares)	**Potential Natural Cover to Restore** (in hectares)	**Total Size** (in hectares)	**By Habitat Type** (in hectares)
7. Marie Curtis / Arsenal **(Lower Etobicoke)** City of Toronto and City of Mississauga	7.3	15.9	23.2	Forest (17), Riparian (5.3), Wetland (0.6), Shoreline (0.3)
8. Brampton Golf Club / Peel Village Golf Club **(Tributary 3 / West Branch)** City of Brampton	5.5	22.1	27.6	Forest (24.2), Meadow (1.1), Riparian (2.0), Wetland (0.3)
9. Eastgate Transitway **(Little Etobicoke Creek / Main Branch)** City of Mississauga	12.1	13.3	25.4	Forest (10.1), Meadow (9.6), Riparian (2.5), Wetland (3.3)
10. CAA Centre **(West Branch / Tributary 3)** City of Brampton	7.8	9.2	17.0	Forest (10.6), Meadow (3.0), Riparian (2.9), Wetland (0.4)
TOTALS	**268.3**	**780.7**	**1,049.2**	**Forest (496.6), Meadow (93.1), Riparian (265.5), Wetland (192.6), Shoreline (0.3)**

Notes:
*If there is urban expansion in the headwaters, most of the restoration opportunities will be through stewardship, and areas with high ecological function should be included in the NHS.

There may be some minor discrepancies between total size, existing + potential, and by habitat type due to rounding, overlap of restoration opportunities, and the exclusion of restoration opportunities like green infrastructure.



Map 3B

This map shows the priority restoration sites by subwatershed based on aquatic and terrestrial criteria and total size.

MANAGEMENT ACTIONS

2.1.4 and 3.1.3 refer to this map. See **Table 13** for more details on each priority site.

Appendix B contains information on how the priority restoration areas were determined.

TABLE 13:
Priority Restoration Sites by Subwatershed

Name of Site (Subwatershed)	**Existing Natural Cover to Enhance** (in hectares)	**Potential Natural Cover to Restore** (in hectares)	**Total Size** (in hectares)	**By Habitat Type** (in hectares)
1. Headwaters 1* (Headwaters) Town of Caledon	**130.2**	**550.4**	**680.6**	**Forest (357.2), Riparian (159.4), Wetland (164 ha)**
2. Conservation Drive Park (Headwaters) City of Brampton	8.4	3.2	11.6	Forest (5.5), Riparian (1.4), Wetland (1.2)
3. Summer Valley (Headwaters) Town of Caledon	2.8	2.2	5.0	Forest (1.4), Riparian (0.8), Wetland (0.8)
4. Loafers Lake (Headwaters) City of Brampton	2.9	0.1	3.0	Riparian / Wetland (3.0)
5. Pearson 1 (Spring Creek Portion) City of Mississauga	**19.0**	**8.8**	**27.8**	**Forest (0.4), Riparian (21.1), Wetland (1.6)**
5. Pearson 1 (West Branch Portion) City of Mississauga	**13.2**	**2.9**	**16.2**	**Forest (5.1), Riparian (10.3), Wetland (0.8)**
5. Pearson 1 (Main Branch Portion) City of Mississauga	**19.0**	**8.8**	**27.8**	**Forest (0.4), Riparian (21.1), Wetland (1.6)**

***Note:**
If there is urban expansion in the headwaters, most of the restoration opportunities will be through stewardship, and areas with high ecological function should be included in the NHS.

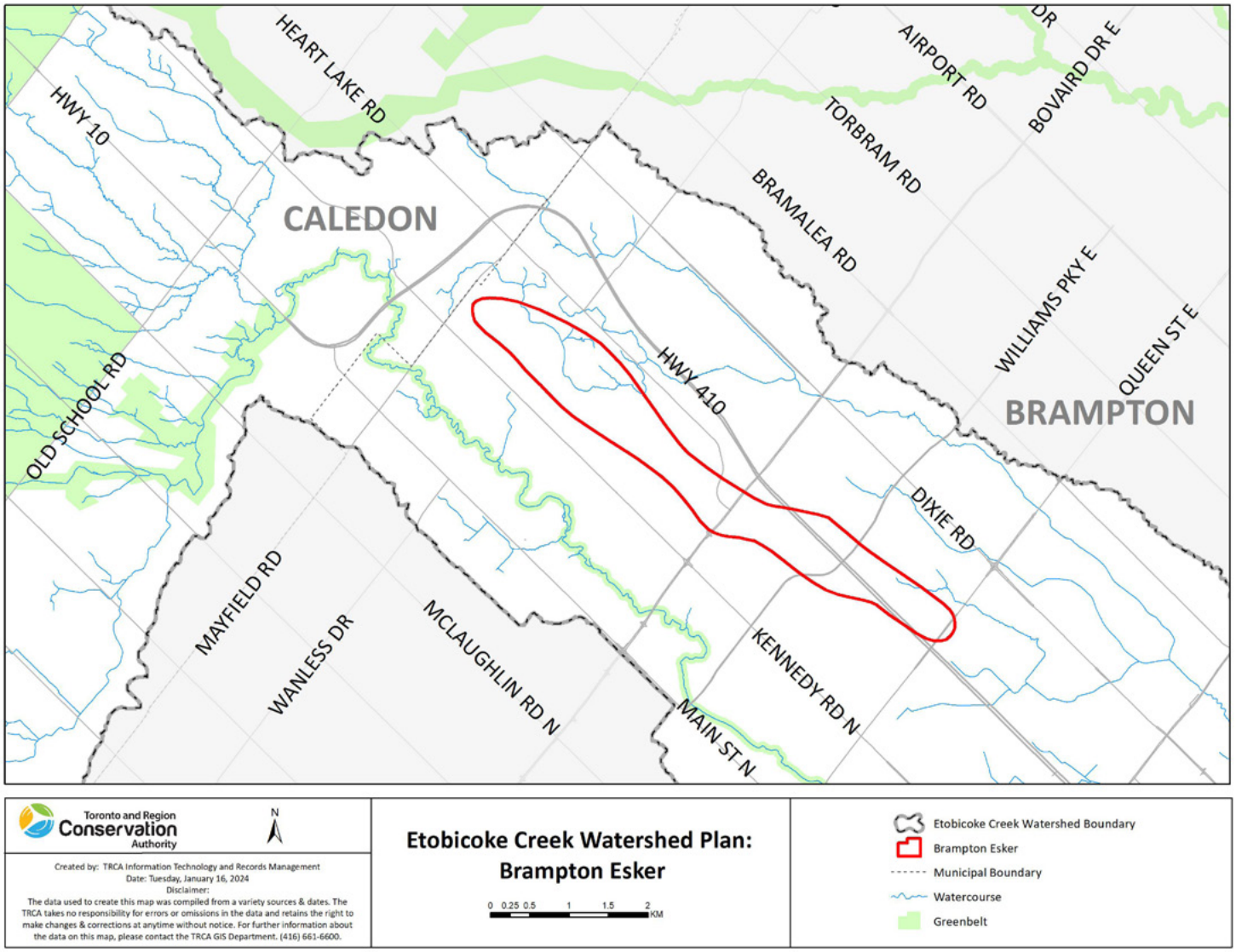
Name of Site (Subwatershed)	**Existing Natural Cover to Enhance** (in hectares)	**Potential Natural Cover to Restore** (in hectares)	**Total Size** (in hectares)	**By Habitat Type** (in hectares)
6. Wildfield Park (Spring Creek) City of Mississauga	8.6	5.1	13.7	Forest (0.8), Riparian (11.6), Wetland (1.3)
7. Hwy 407 Median (Spring Creek) City of Brampton and City of Mississauga	13.0	0.5	13.5	Forest (8.6), Riparian (2.2), Wetland (2.7)
8. Hwy 407 Hydro (East of 410) (Spring Creek Portion) City of Brampton	**4.9**	**0.1**	**5.0**	**Forest (0.7), Riparian (1.4), Wetland (2.6)**
8. Hwy 407 Hydro (East of 410) (West Branch Portion) City of Brampton	**22.9**	**27.1**	**50.0**	**Forest (22.5), Meadow (16.7), Riparian (5.4), Wetland (5.5)**
8. Hwy 407 Hydro (East of 410) (Tributary 3 Portion) City of Brampton	**2.4**	**22.8**	**25.2**	**Forest (2.4), Meadow (17.0), Riparian (5.6), Wetland (0.3)**
9. Centennial Park Etobicoke (Tributary 4) City of Toronto	2.3	22.7	25.1	Forest (8.2), Meadow (8.6), Riparian (3.8), Wetland (3.5)
10. CAA Centre (West Branch) City of Brampton	**7.6**	**9.1**	**16.7**	**Forest (10.3), Meadow (3.0), Riparian (2.9), Wetland (0.4)**
11. Westcreek Trailhead (West Branch) City of Brampton	7.5	7.6	15.1	Forest (10.0), Riparian (4.5), Wetland (0.6)

Name of Site (Subwatershed)	**Existing Natural Cover to Enhance** (in hectares)	**Potential Natural Cover to Restore** (in hectares)	**Total Size** (in hectares)	**By Habitat Type** (in hectares)
12. King's Park (West Branch) City of Mississauga	3.2	0.4	3.6	Forest (1.4), Riparian (2.2)
13. Hwy 407 Hydro (West of 410) (Tributary 3) City of Brampton	**9.2**	**57.0**	**66.1**	**Forest (10), Meadow (30.8), Riparian (20), Wetland (5.3)**
14. Brampton Golf Club / Peel Village Golf Club (Tributary 3) City of Brampton	**3.4**	**16.5**	**19.9**	**Forest (19), Riparian (0.9)**
15. SWMP Derry Road (Tributary 3) City of Mississauga	2.4	0.3	2.7	Riparian (2.7)
16. Wood Creek (Main Branch) City of Mississauga	11.4	25.2	36.6	Forest (22.4), Meadow (5.9), Riparian (6.4), Wetland (1.8)
17. Eastgate Transitway (Main Branch) City of Mississauga	2.7	4.1	6.8	Forest (2.6), Meadow (3.1), Wetland (1.1)
17. Eastgate Transitway (Little Etobicoke Creek) City of Mississauga	**9.4**	**9.3**	**18.7**	**Forest (7.5), Meadow (6.5), Riparian (2.5), Wetland (2.2)**
18. Fleetwood Park (Main Branch) City of Mississauga	0.7	1.7	2.4	Forest (1.5), Riparian (0.4), Wetland (0.4)

Name of Site (Subwatershed)	**Existing Natural Cover to Enhance** (in hectares)	**Potential Natural Cover to Restore** (in hectares)	**Total Size** (in hectares)	**By Habitat Type** (in hectares)
19. Iceland Forest (Little Etobicoke Creek) City of Mississauga	3.0	6.0	9.0	Forest (4.8), Riparian (1.6), Wetland (2.6)
20. Hwy 403 Eglinton (Little Etobicoke Creek) City of Mississauga	1.3	2.2	3.5	Forest (3.0), Wetland (0.5)
21. Rathwood Park 1 (Little Etobicoke Creek) City of Mississauga	0.8	0.8	1.6	Forest (0.7), Riparian (0.5), Wetland (0.3)
22. Marie Curtis / Arsenal (Lower Etobicoke) City of Toronto and City of Mississauga	**7.3**	**15.9**	**23.2**	**Forest (17), Riparian (5.3), Wetland (0.6), Shoreline (0.3)**
23. Etobicoke Creek Valley Park North (Lower Etobicoke) City of Toronto	4.4	4.5	9.0	Forest (7.6)

Notes:
There may be some minor discrepancies between total size, existing + potential, and by habitat type due to rounding, overlap of restoration opportunities, and the exclusion of restoration opportunities like green infrastructure and invasives management.

There is intentional overlap between the Top 10 watershed sites and the priority restoration sites by subwatershed, since the Top 10 by watershed are the largest sites by amount of restoration opportunity, which would also be the top sites for the relevant subwatershed. Sites that are also Top 10 watershed sites are in **bold**.

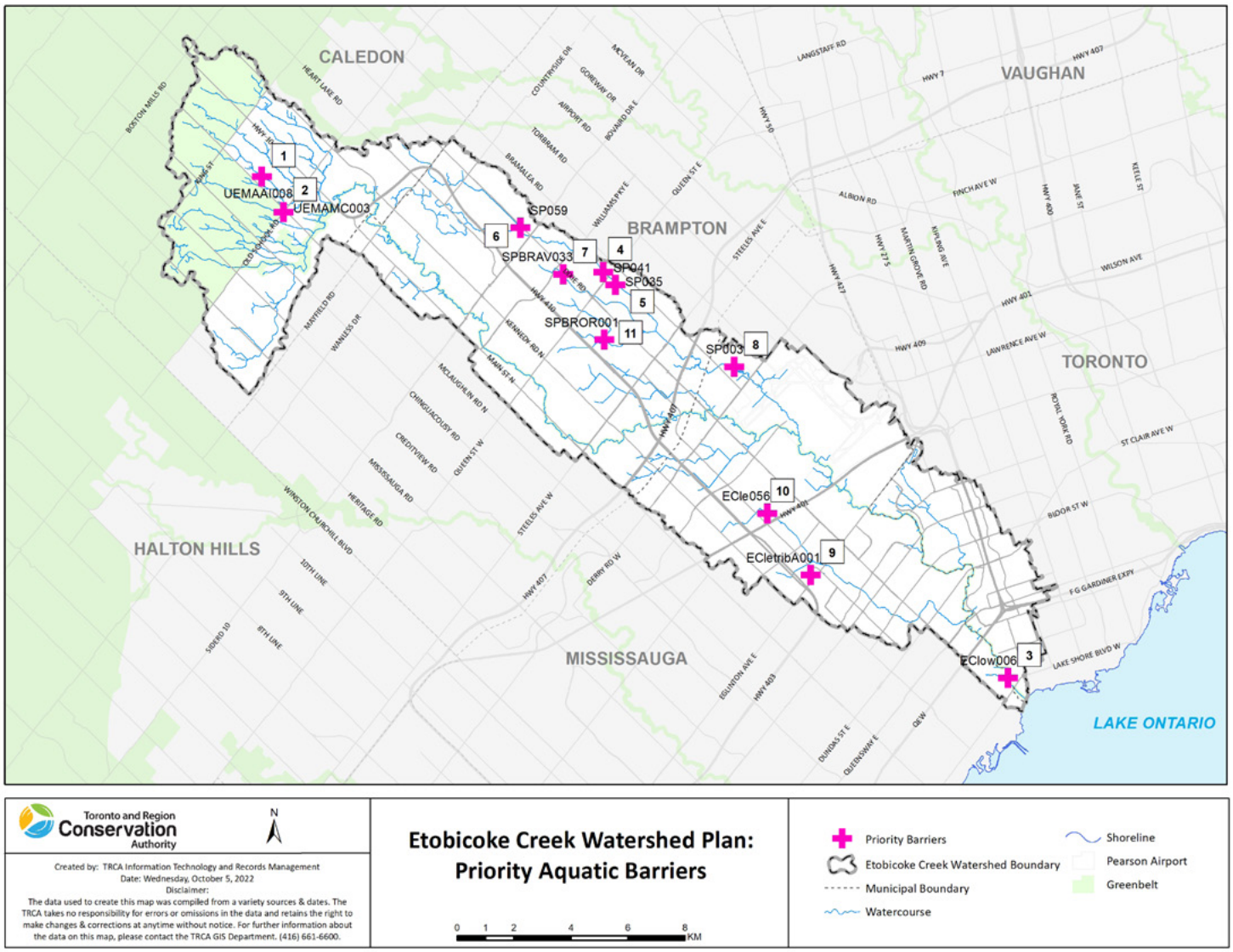


Map 4

This map shows the location of the Brampton Esker.

MANAGEMENT ACTION

2.1.5 refers to this map.



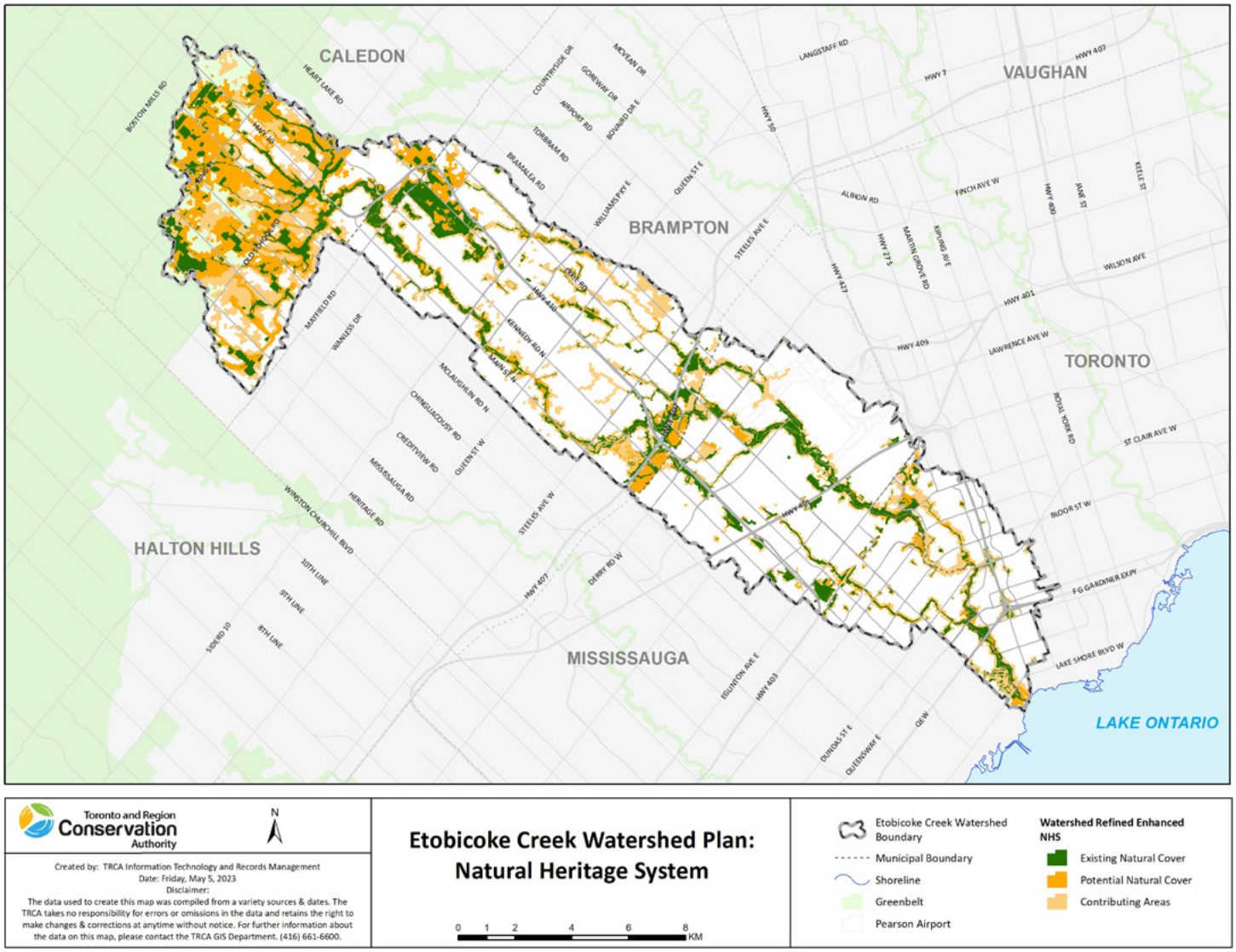
Map 5

This map shows the priority aquatic barriers for removal to restore in-stream habitat connectivity.

MANAGEMENT ACTION

2.2.1 refers to this map.

Barrier #	Type of Barrier
1	Weir
2	Road crossing
3	Weir
4	Dam
5	Weir
6	Stormwater weir
7	Weir
8	Stormwater culvert
9	Weir
10	Natural erosion step
11	Weir



Map 6

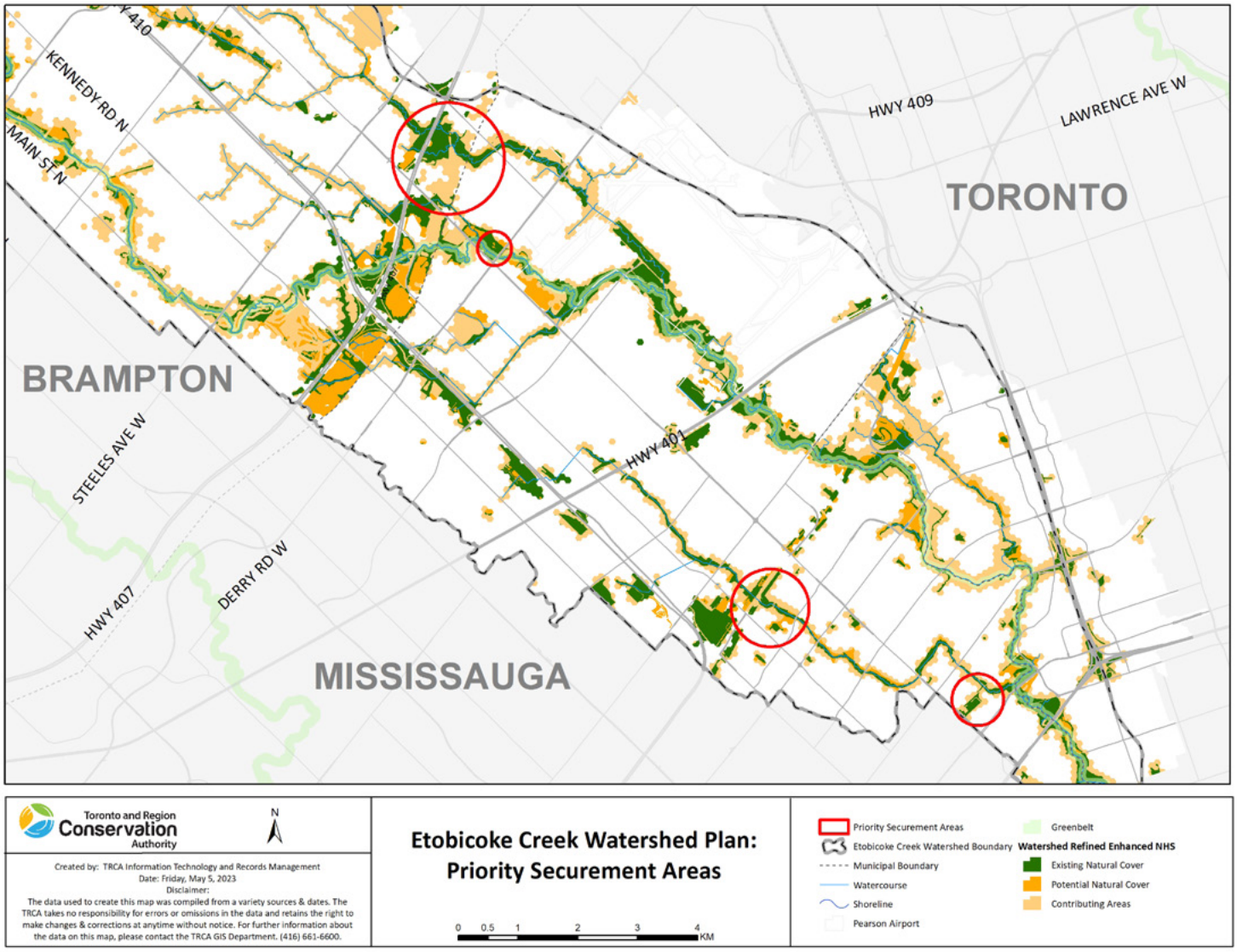
This map shows the watershed refined enhanced NHS, consisting of existing natural cover, potential natural cover, and contributing areas.

Potential natural cover are areas that could be restored to provide ecosystem and habitat benefits.

Contributing areas are built or unbuilt areas that can provide additional habitat and connectivity benefits through the use of green infrastructure.

MANAGEMENT ACTION

3.1.2 refers to this map.



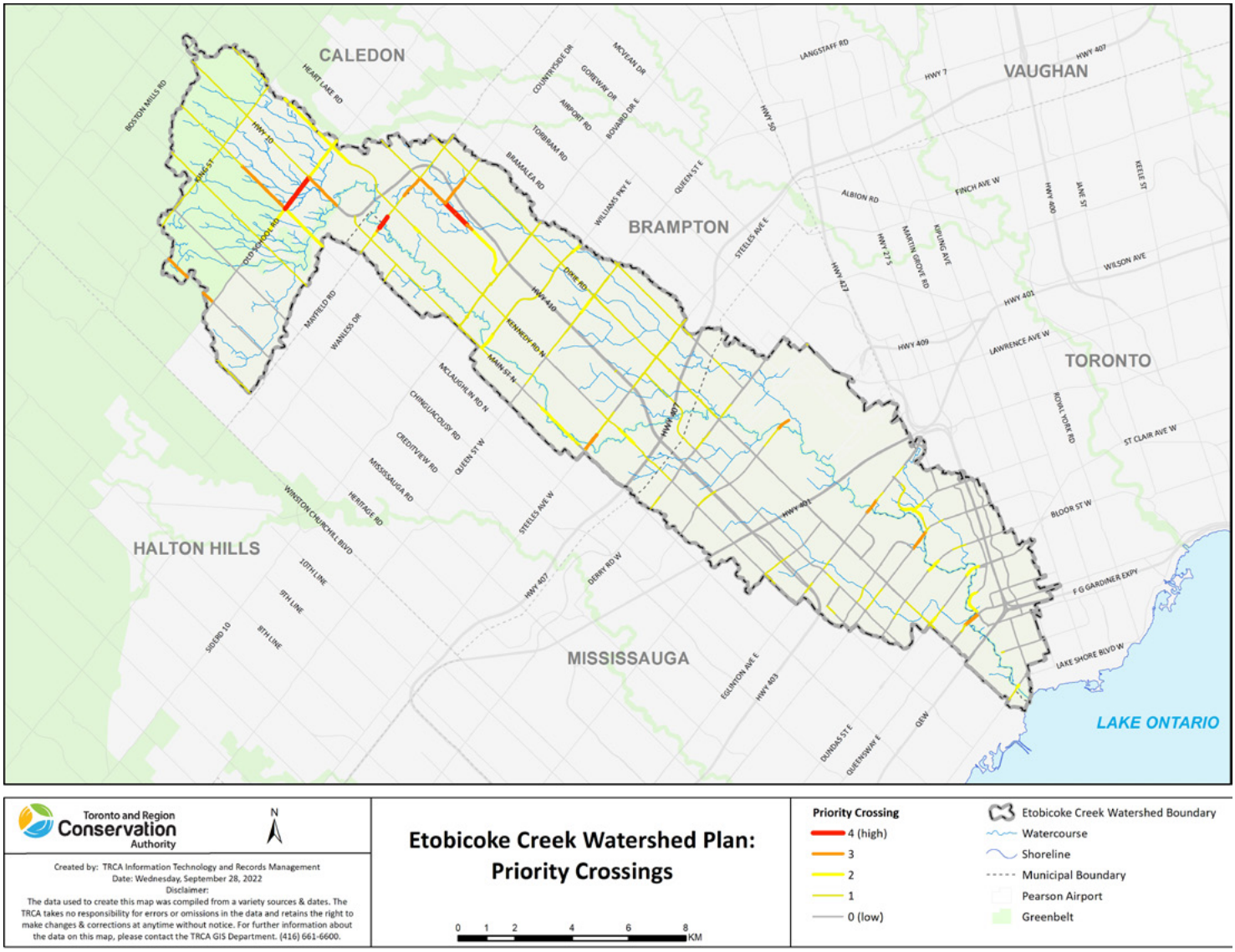
Map 7

This map shows priority areas for land securement based on lands where restoration priorities intersect with Flood Vulnerable Clusters (on both private land and some public land such as Hydro ROWs not in municipal or TRCA ownership). These areas are priorities to use nature-based solutions as part of flood risk mitigation. For land already in public ownership, the focus would be on conservation efforts (i.e. meadow habitat restoration) when opportunities arise.

Other lands outside these areas may be secured by municipalities or TRCA to increase public land ownership to achieve habitat objectives associated with this watershed plan.

MANAGEMENT ACTION

3.1.4 refers to this map.

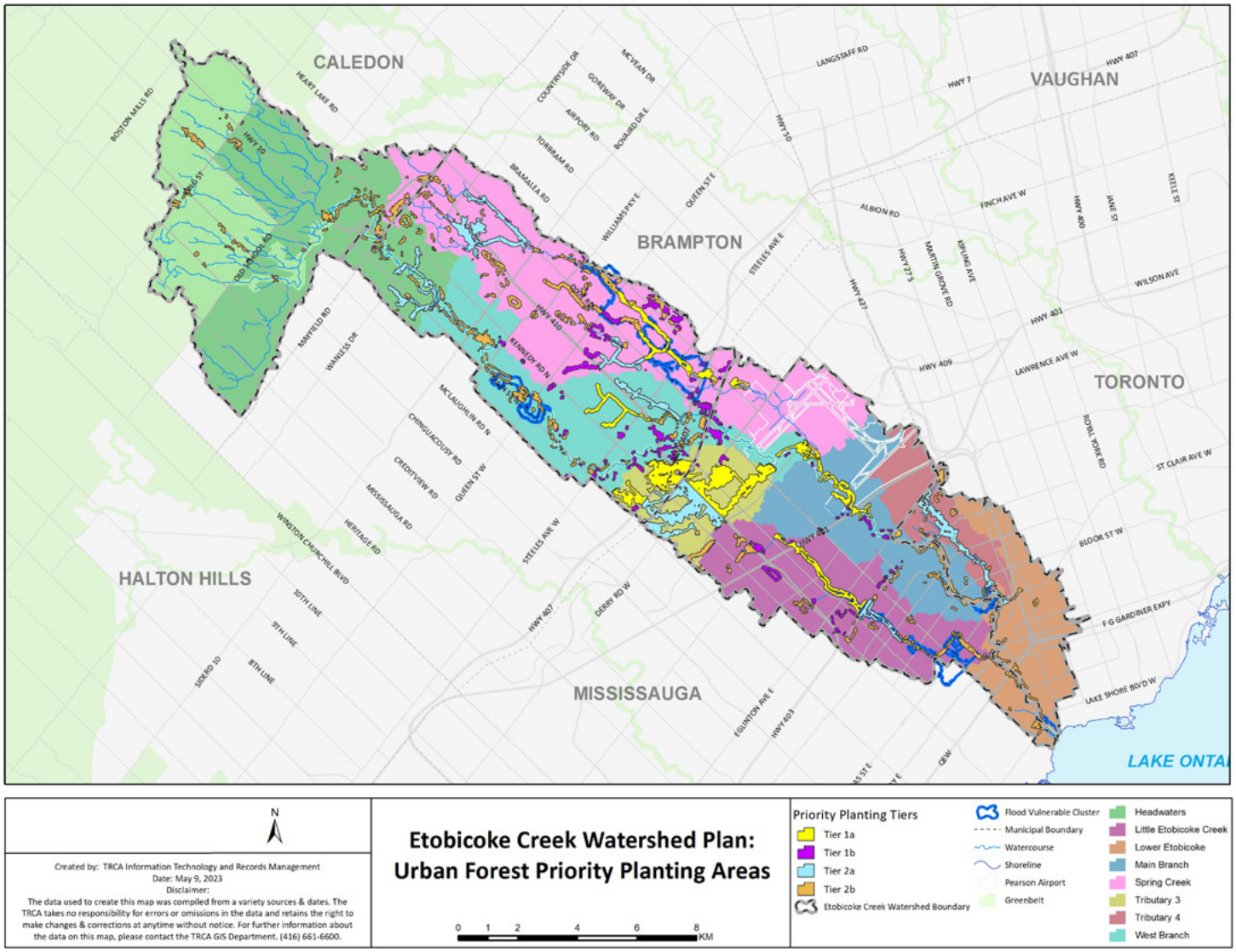


Map 8

This map shows priority road crossings to enhance connectivity for wildlife to pass safely.

MANAGEMENT ACTION

3.1.6 refers to this map.



Map 9

This map shows the priority planting areas to increase tree canopy cover (i.e. urban forest) within the watershed.

See **Appendix B** for more information on each tier and how the priority areas were determined.

MANAGEMENT ACTIONS

3.2.1 and 3.2.3 refer to this map.

8. Glossary

Biodiversity
The variability among organisms from all sources including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species and ecosystems.

Detention
The temporary storage of stormwater to control discharge rates and allow for sedimentation.

Ecological Function
The natural processes, products, or services that living and non-living environments provide or perform within or between species, ecosystems, and landscapes, including hydrologic functions and biological, physical, chemical, and socio-economic interactions.

Green Infrastructure
Natural and human-made elements that provide ecological and hydrologic functions and processes. Green infrastructure can include components such as natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs.

Headwater Drainage Features
Ill-defined, non-permanently flowing drainage features that may not have defined beds and banks.

Highly Vulnerable Aquifer
Aquifers, including lands above the aquifers, on which external sources have, or are likely to have, a significant adverse effect.

Hydrologic Function
The functions of the hydrologic cycle that include the occurrence, circulation, distribution, and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things.

Impervious Cover

EFFECTIVE IMPERVIOUS AREA/COVER

Represents a portion of the total impervious area that sheds stormwater directly into a water body or a storm drain system without being treated (e.g. by low impact development, green infrastructure, filtration, sedimentation, or other conventional techniques).

TOTAL IMPERVIOUS AREA/COVER

A measure of all the hard impermeable surfaces in the landscape that prevent precipitation from penetrating the ground in a catchment.

UNTREATED IMPERVIOUS COVER

Areas where runoff from impervious surfaces is conveyed directly to waterbodies without being treated (e.g., by low impact development, green infrastructure, filtration, sedimentation, or other conventional techniques).

Infiltration

The entry of water into site soils or material.

Key Hydrologic Areas

Significant groundwater recharge areas, highly vulnerable aquifers, significant surface water contribution areas, and ecologically significant groundwater recharge areas, that are necessary for the ecological and hydrologic integrity of a watershed.

Key Hydrologic Features

Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.

Low Impact Development

An approach to stormwater management that seeks to manage rain and other precipitation as close as possible to where it falls to mitigate the impacts of increased runoff and stormwater pollution. It typically includes a set of site design strategies and distributed, small-scale structural practices to mimic the natural hydrology to the greatest extent possible through infiltration, evapotranspiration, harvesting, filtration, and detention of stormwater. Low impact development can include, for example: bio-swales, vegetated areas at the edge of paved surfaces, permeable pavement, rain gardens, green roofs, and exfiltration systems. Low impact development often employs vegetation and soil in its design, however, that does not always have to be the case and the specific form may vary considering local conditions and community character.

Natural Hazards *(Consisting of Erosion Hazard and Flooding Hazard)*

EROSION HAZARD

Means the loss of land, due to human or natural processes, that poses a threat to life and property.

FLOODING HAZARD

Means the inundation of areas adjacent to a shoreline or a river or stream system not ordinarily covered by water.

Natural Heritage System

A system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems. The system can include key natural heritage features, key hydrologic features, federal and provincial parks and conservation reserves, other natural heritage features and areas, lands that have been restored or have the potential to be restored to a natural state, associated areas that support hydrologic functions, and working landscapes that enable ecological functions to continue.

Predevelopment

Is defined as follows for the various development conditions:

NEW DEVELOPMENT (I.E. GREENFIELD DEVELOPMENT AND/OR AGRICULTURAL CONVERSION TO URBAN)

The predevelopment impervious condition shall correspond to the current conditions present in the field at the project onset or to an undisturbed forested condition.

REDEVELOPMENT (I.E. EXISTING URBAN AREAS)

The predevelopment impervious condition shall correspond to the current conditions present in the field at the project onset, or the least urbanized conditions (i.e. lowest total impervious percentage for the site) prior to the project onset.

LINEAR DEVELOPMENT AND RETROFITS

The predevelopment impervious condition for the right-of-way shall correspond to the current conditions present at the project onset.

Riparian

The areas adjacent to water bodies such as streams, wetlands, and shorelines. Riparian areas form transitional zones between aquatic and terrestrial ecosystems.

Sustainable Community Retrofits

Focus on public and private land actions in older, urban neighbourhoods by retrofitting buildings and infrastructure, regenerating habitats and urban ecology, and revitalizing a community's social fabric. TRCA's Sustainable Neighbourhood Action Program provides examples of sustainable community retrofits.

Urban Forest

All trees, shrubs, and understory plants, as well as the soils that sustain them, occurring on public and private property in natural, urban, and rural areas.

Water Balance

The accounting of inflow and outflow of water in a system according to the components of the hydrologic cycle.

Water Resource System

A system consisting of ground water features and areas and surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption. The water resource system is comprised of key hydrologic features and key hydrologic areas.

Whitebelt

Refers to lands between the built boundary of urban settlement areas and the boundary of the Greenbelt Plan Area.

9. References

ECWP Technical Reports

Toronto and Region Conservation Authority, 2022. *Etobicoke Creek Watershed Future Management Scenario Analysis Report.*

Toronto and Region Conservation Authority, 2021. *Etobicoke Creek Watershed Characterization Report.*

ECWP Engagement Summaries

Toronto and Region Conservation Authority, 2024. ECWP: *Engagement Summary 3 – August 2022 – March 2024.*

Toronto and Region Conservation Authority, 2022. *ECWP: Engagement Summary 2 – July 2021 – July 2022.*

Toronto and Region Conservation Authority, 2021. ECWP: *Engagement Summary 1 – July 2020 – June 2021.*

Provincial / Federal Policies / Plans / Guidelines

Canadian Council of Ministers of the Environment, no date. *Water Quality Guidelines for the Protection of Aquatic Life.*

CTC Source Protection Committee, 2019. *Approved Source Protection Plan: CTC Source Protection Region.* Amendment (Version 2.0) effective March 25, 2019.

Environment Canada, 2013. *How Much Habitat is Enough?* Third Edition.

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Ontario, 2017. *Greenbelt Plan.*

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Ontario, 2013. *Ontario's Cycling Strategy - Province Wide Cycling Network.*

Schueler, T, 1994. *The Importance of Imperviousness.* Watershed Protection Techniques 2: 100-111.

Great Lakes Agreement and Policies

Government of Canada and Government of Ontario, 2021. *Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health.*

Government of Canada and Government of the United States of America, 2012. *Great Lakes Water Quality Agreement.*

Ontario, 2016. *Ontario's Great Lakes Strategy.*

TRCA Guidelines

Credit Valley Conservation and Toronto and Region Conservation Authority, 2014. *Evaluation, Classification and Management of Headwater Drainage Features Guidelines.*

Toronto and Region Conservation Authority, 2019. *Trail Strategy for the Greater Toronto Region.*

Toronto and Region Conservation Authority, 2018 (updated June 2023). *Guideline for Determining Ecosystem Compensation (after the decision to compensate has been made).*

Toronto and Region Conservation Authority, 2017. *Wetland Water Balance Risk Evaluation.*

Toronto and Region Conservation Authority, 2016. *Wetland Water Balance Monitoring Protocol.*

Toronto and Region Conservation Authority, 2015. *Crossings Guideline for Valley and Stream Corridors.*

Toronto and Region Conservation Authority, 2012. *Stormwater Management Criteria.*

Relevant Municipal Plans / Strategies / Guidelines

Note: *this is not an exhaustive list of potentially relevant municipal plans, strategies, or policies with relevance to this watershed plan. It does not include Official Plans, Secondary Plans, Master Plans, or Bylaws, which may need to be updated as part of implementation of this watershed plan.*

Instead, the list below includes complementary Strategies, Plans, or Guidelines related to water management, biodiversity, environmental protection, etc.

CITY OF TORONTO

Biodiversity Strategy. October 2019.

Parkland Strategy. Adopted November 2019.

Ravine Strategy. Adopted October 2017.

Toronto Green Standard, Version 4. Adopted July 2021.

TransformTO: Net Zero Strategy, A Climate Action Pathway to 2030 and Beyond. November 2021.

Toronto's Strategic Forest Management Plan. Adopted February 2012.

Wet Weather Flow Master Plan. Adopted September 2003.

REGION OF PEEL

Climate Change Master Plan, 2020 – 2030. Adopted 2019.

Scoped Subwatershed Study (Part A – Existing Conditions and Characterization, Part B – Detailed Studies and Impact Assessment, and Part C – Implementation Plan), Settlement Area Boundary Expansion. 2022.

CITY OF MISSISSAUGA

City of Mississauga Climate Change Action Plan. Adopted November 2021.

Living Green Master Plan. Adopted January 2012.

Natural Heritage and Urban Forest Strategy. Adopted January 2014.

Parks and Forestry Master Plan. Adopted February 2019.

CITY OF BRAMPTON

Brampton Eco Park Strategy. Adopted in 2019.

Brampton Grow Green Environmental Master Plan. Adopted in 2014.

Brampton One Million Trees Program. Adopted in 2019.

Lake Enhancement Strategy. Adopted in 2021.

Natural Heritage and Environmental Management Strategy. Adopted December 2015.

Our 2040 Energy Transition: Community Energy and Emissions Reduction Plan. Adopted in 2020.

TOWN OF CALEDON

Community Climate Change Action Plan. Adopted January 2020.

Other References

Toronto and Region Conservation Authority. *Ecosystem Services and Valuation Webpage:* https://trca.ca/conservation/creating-green-infrastructure/ecosystem-services-valuation/.

Toronto and Region Conservation Authority. *Wildlife Movement and Habitat Connectivity Webpage:* https://trca.ca/conservation/terrestrial-ecosystems/wildlife-movement-and-habitat-connectivity/.

Toronto Green Community. *Lost Rivers Webpage:* https://www.torontogreen.ca/what-we-do/lost-rivers/.

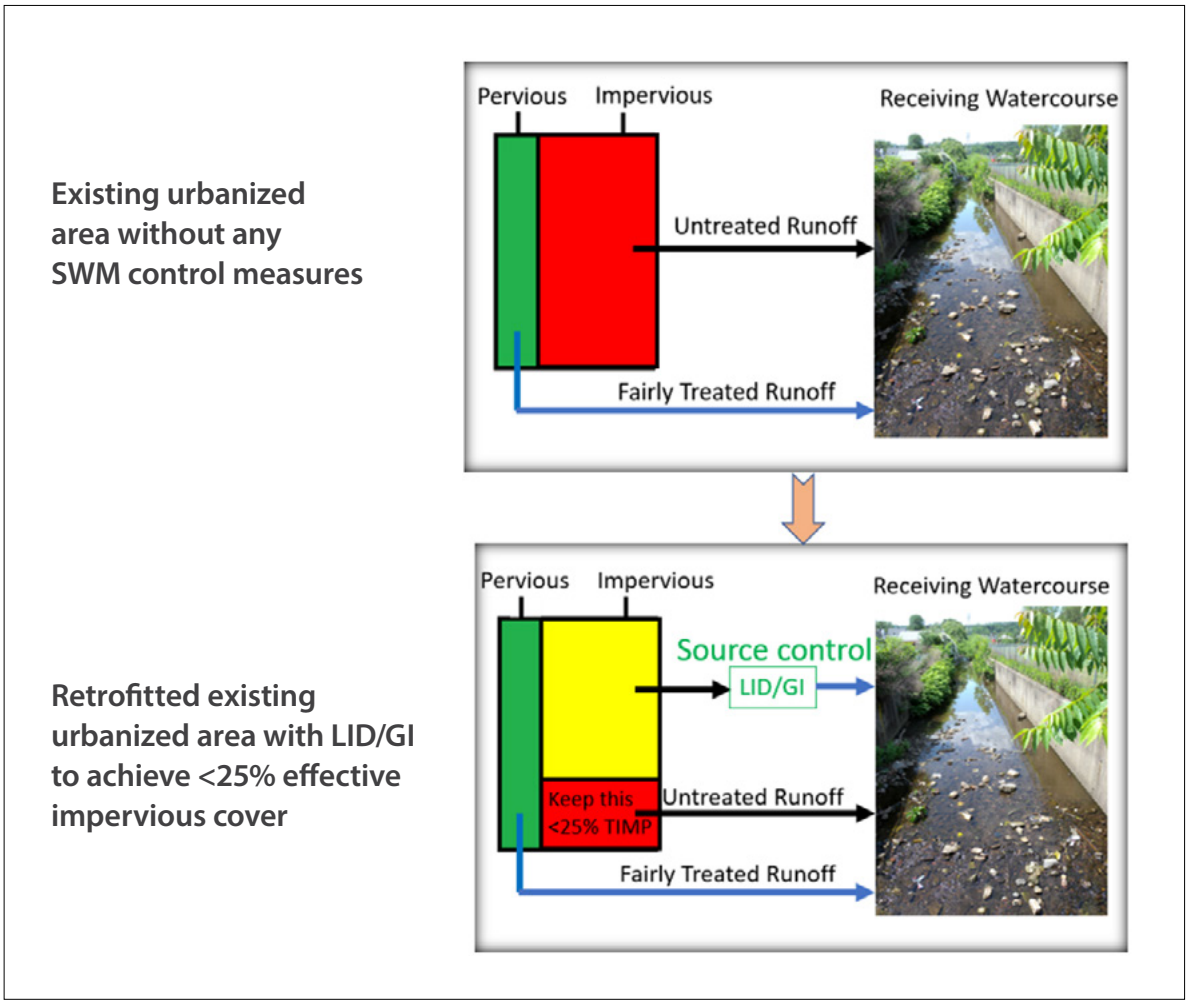
APPENDIX A

As outlined in **Section 3.3 - Current State of the Watershed**, aquatic habitat quality is expected to decrease as impervious cover increases. Environment Canada provides recommendations on impervious cover percentages and has defined the quality of aquatic habitat based on the amount of impervious cover in a catchment area where 'sensitive' quality habitat occurs when there is 0-10% impervious cover, and declines in aquatic habitat quality are demonstrated when impervious cover is between 11-25% (impacted/urbanizing), greater than 25% (non-supporting), and greater than 60% (urban drainage). Therefore, to minimize impacts to aquatic habitat health, it is recommended that the impervious cover percentage (effective impervious cover) for the Headwaters subwatershed (and the watershed in general) remains below 25%. This is reflected in management actions 1.2.2 (c) and 2.1.3.

The following provides additional details about total impervious cover and effective impervious cover (see **Section 8 - Glossary** for definitions), the need for a 25% effective impervious cover target, and various stormwater management control measures in existing urbanized and urban expansion areas.

1 Existing urbanized area without any control measures:

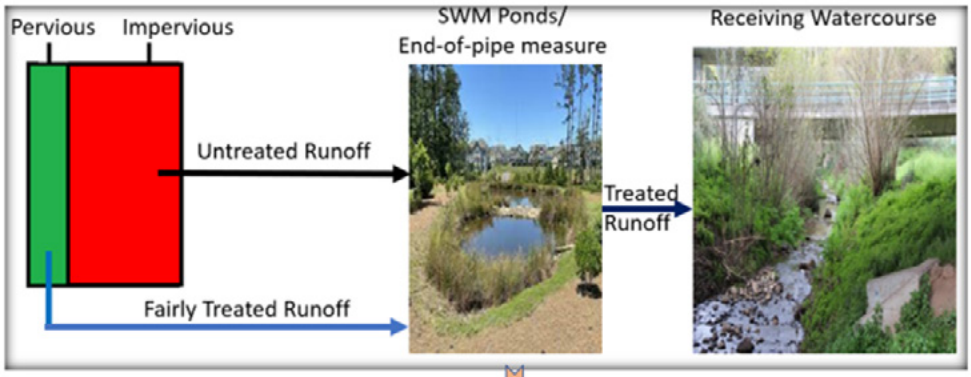
Decreasing the impervious area that is directly connected to the storm sewer network to 25% of the total impervious area (TIMP) by connecting the remaining impervious area back to the ground via implementation of green infrastructure is crucial to reverse impacts of uncontrolled runoff generated from impervious cover. By doing so, we can mitigate the impacts of impervious cover on the watershed's hydrological cycle (the amount of runoff, peak discharge rates, and baseflow are altered), stream morphology, stream temperature, stream water quality (nutrient and pollutant loads increase), and stream biodiversity.



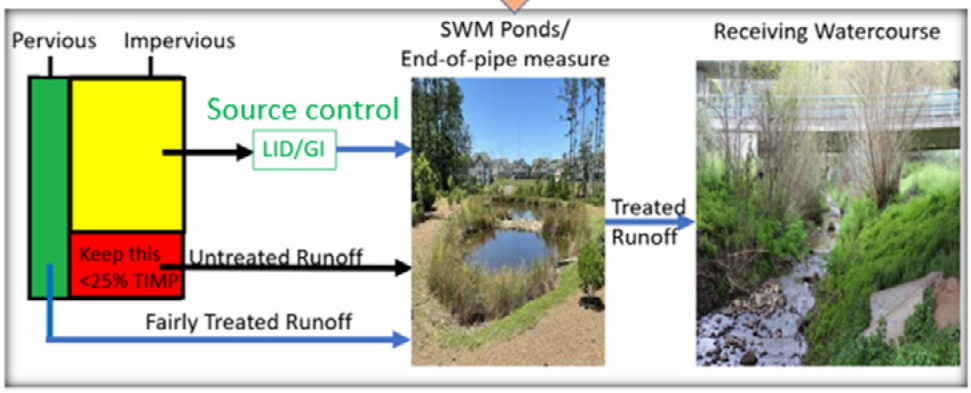
2 Existing urbanized area with some end-of-pipe control measures:

Managing stormwater at the source (source controls) is widely effective for limiting the negative hydrological effects of urbanization. Decreasing the impervious area directly connected to the storm sewer network to 25% of total impervious area by connecting the remaining impervious area back to the ground via implementation of green infrastructure is recommended to further enhance the health of the watershed. This illustrates a recommendation/ opportunity to go beyond the minimum requirements of stormwater management treatment criteria to help minimize impacts to the health of the receiving watercourse.

Existing urbanized area with stormwater management pond (SWM pond) or end-of-pipe control measures



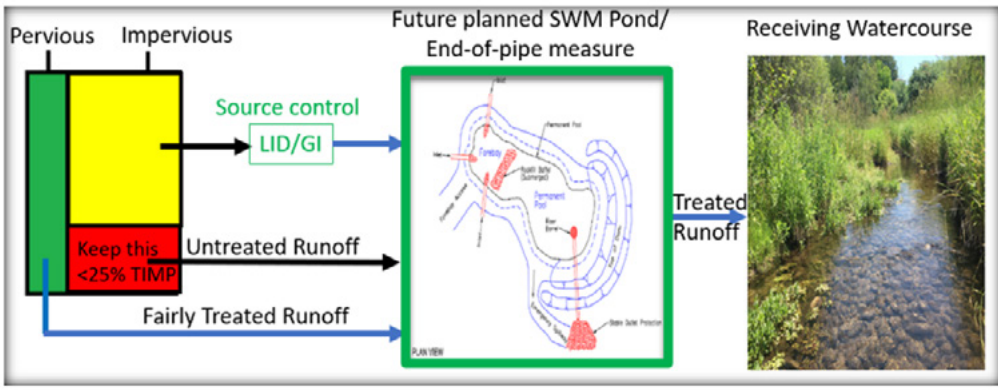
Implementing source control measures (LID/ GI) in existing urbanized area with SWM pond to achieve <25% effective impervious cover



3 Future urban expansion areas within the Town of Caledon that apply current stormwater management criteria:

These future urban expansion areas have the opportunity to achieve the current stormwater management criteria and benefit the receiving waterbodies by implementing green infrastructure to target stormwater at the source and limit the effective impervious cover to less than 25%, effectively augmenting the end-of-pipe conventional stormwater management. This illustrates a recommendation/opportunity to go beyond the minimum requirements of stormwater management treatment criteria to help minimize impacts to the health of the receiving watercourse.

Implementing source control measures (LID/GI) along with proposed SWM pond to achieve <25% effective impervious cover in the future urban expansion



APPENDIX B

This appendix contains more details on prioritization exercises for LID, restoration, and urban forest that form a key part of the management framework.

LID Implementation Case Study

Map 1 shows areas in the watershed that would benefit the most from LID or green infrastructure implementation to help regain natural or pre-development water balance. These areas were identified based on a multi-hit analysis of various criteria (including the results from the erosion and water quality modelling, and other data layers including imperviousness, ESGRAs, sensitive fish species, NHS Contributing Areas, and the Brampton Esker) to determine the highest scoring areas that could benefit from LID or green infrastructure implementation at the watershed-scale. Areas in red are those that would benefit the most from the use of LID or green infrastructure implementation.

A case study of the cost and benefits of particular LIDs is presented to demonstrate how watershed enhancements such as this can address issues related to flooding, water quality, and erosion in developed portions of the watershed.

The LID implementation case study uses the **Treatment Train Tool** to assess the costs/benefits of LID implementation at the southeast corner of Bovaird Drive and Hurontario Street (West Branch subwatershed). This case study assumed three bioretention sites (two at the Walmart, and one at the row houses), one vegetated strip near the school, and two infiltration trenches by the Walmart.

The focus of this case study was a return to pre-development water balance.

The modelled LIDs were designed with a rainfall depth control target of 25 mm and a volume control target of 3,142.5 m^2.

For the chosen site, the results are shown in **Table 14**.

TABLE 14:
LID Modelling Results Pre and Post Retrofit

Site	Total (mm)
Site Rainfall	753
Infiltration Pre-retrofit	318
Infiltration Post-retrofit	463
External Outflow Pre-retrofit	263
External Outflow Post-retrofit	92
Rainfall Retention On-site Pre-retrofit	490 (65%)
Rainfall Retention On-site Post-retrofit	662 (88%)

The modelling results demonstrate that widespread LIDs designed to retain 25 mm of rainfall would prevent 90% of annual rainfall events from generating runoff.

Table 15 identifies the construction and maintenance costs associated with the modelled LIDs. The total life-cycle costs consist of the construction and 25-year maintenance costs for each LID. Costs provided in Table 15 are an approximation based on 2023 construction/maintenance prices for the LIDs – and would vary based on market prices/conditions.

TABLE 15:
LID Implementation Case Study Costing

LID Type	Construction Cost	25-year Maintenance Cost	Total Lifecycle Cost
Bioretention	$794,124.80	$554,288.30	$1,348,413.10
Vegetated Strips	$122,455.00	$176,890.00	$299,345.00
Infiltration Trenches	$726,926.70	$372,727.50	$1,099,654.20
TOTALS	**$1,643,506.50**	**$1,103,905.80**	**$2,747,412.30**

FOR CONSIDERATION:

It is important to note that extreme events greater than 25 mm cannot be retained. Existing stormwater infrastructure is built to a standard of conveying and controlling the 100-year or Regional storm (current rainfall volume of 88.5 mm). With climate change, this rainfall volume is projected to increase to 107 mm, resulting in a need for additional storage of 18.9 mm. It will be necessary to factor climate change into stormwater asset management planning, including the implementation of LIDs as a volume control form of infrastructure.

ADDITIONAL RESOURCES:

The **Sustainable Technologies Evaluation Program** has guidance and resources on Low Impact Development that can inform municipal and development planning.

Terrestrial and Aquatic Restoration Priorities

Priority areas for ecological restoration (as shown in **Maps 3A** and **3B**) were determined through a multiple hit analysis of various terrestrial and aquatic criteria overlayed with the NHS. This exercise accounted for existing policy designations and future plans, while trying to ensure geographic distribution across the watershed. The purpose of this prioritization exercise was to increase habitat quality and quantity, address biodiversity needs, and improve climate resiliency. Costing for restoration has not been provided as it is contingent on current market prices and conditions and can change significantly from year to year (but can be provided upon request).

In terms of the criteria identified in **Table 16**, terrestrial and aquatic criteria were equally weighted to determine the highest scoring areas based on ecological function that should be targeted for further restoration to improve both the NHS and WRS.

TABLE 16:
Criteria for Restoration Priorities

Category	Aquatic Criteria	Terrestrial Criteria
Habitat Quantity	ESGRA HDF Riparian Corridor	Natural Cover Habitat Patch (L-rank)
Habitat Quality and Biodiversity	Benthic Species Diversity Fish Species Diversity	Vegetation Communities of Concern (ELC) Species Abundance (avian L1-L4) Species Richness (avian L1-L4) Habitat Suitability (avian and amphibians)
Habitat Connectivity	Stream Connectivity	Regional Connectivity (Top 50%) Watershed Connectivity (Top 50%) Local Connectivity (Forest-Wetland) Local Connectivity (Forest-Forest)
Climate Change Vulnerability	Thermal Regime – Max Temperature Thermal Regime – Stability	Climate Change Vulnerability

Municipalities may have their own restoration priorities (outlined in various municipal strategies and park plans) in addition to the priority restoration sites identified in **Map 3A** and **Map 3B**. This watershed plan encourages restoring as much habitat as possible across the watershed. TRCA will continue to work collaboratively with our partner municipalities during implementation of the ECWP to investigate opportunities and alignments throughout the watershed for various projects including restoration and channel naturalization, plantings, and the creation of outdoor classrooms and natural style playgrounds, some of which could also become 'signature watershed sites'. This collaborative work will help meet the goals and objectives of the ECWP to enhance and restore the natural heritage system in the watershed.

Urban Forest Priorities

Priority areas for planting to enhance the urban forest canopy in the Etobicoke Creek watershed are not proposed in natural areas. Instead, the urban forest priority planting areas are focused on areas outside of the NHS (i.e. outside of existing and potential natural cover areas) within the contributing areas of the NHS (areas not suitable for restoration but areas that can still provide additional habitat/connectivity through use of LIDs/GI), within ESGRAs and areas with lower canopy cover percentages, and in proximity to the WRS. Social and municipal criteria was also used to identify priority planting areas including heat vulnerability and known municipal priorities like Brampton no-mow areas.

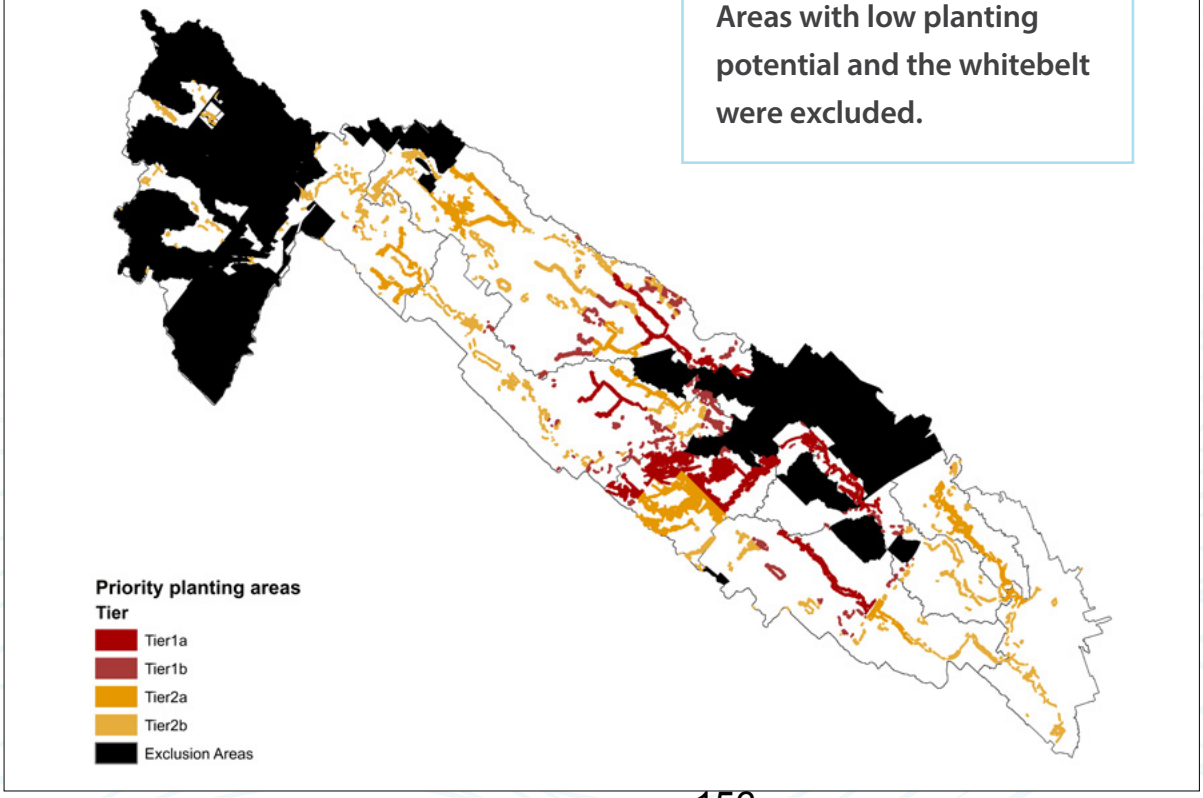
Restoration opportunities in natural areas of the Etobicoke Creek watershed are identified as part of the watershed refined enhanced NHS (generally in potential natural cover areas shown in Map 6) and the priority restoration sites (including plantings/enhancement of forest, riparian, wetland, and shoreline habitat) as shown in Maps 3A and 3B.

Priority areas for planting to enhance the urban forest canopy used a multiple criteria analysis with equally weighted scoring. **Figure 19** shows the results of the multiple criteria analysis.

The first set of criteria were ecological / hydrological, which consisted of:

1. Within the contributing areas of the NHS (i.e. to improve buffers)
2. Proximity to the Water Resource System (i.e. the closer to the system the higher the score)
3. Lower canopy cover of the subwatershed (i.e. needs more trees)
4. Within ESGRAs (i.e. to improve infiltration)

FIGURE 19:
Results of Urban Forest Priority Multiple Criteria Analysis



The social / municipal criteria consisted of the heat vulnerable mapping from Peel Region and known municipal priorities like Brampton no-mow areas and Peel climate change priority areas. The whitebelt was excluded from the analysis because of potential urbanization there. Additionally, areas with low planting potential based on land use (e.g. airport), and land cover (e.g. industrial) were excluded. Assumptions were made for each land use type on the amount of trees planted with impervious areas being more limited.

A tiered approach was chosen to represent priority canopy cover enhancement (see **Map 9** and the results in **Table 17**). Tier 1 represents priority areas based on ecological, hydrological, social, and municipal criteria. Tier 1a represents the top 10 areas by number of trees planted. Tier 2 represents priority areas based on ecological and hydrological criteria. Tier 2a represents the top 10 areas by number of trees planted. Tier 1b and 2b represent the remainder of plantable areas meeting the specified criteria. The number of potential trees to be planted was computed using planting densities specific to each land use type and the assumption that a medium-stature tree would be planted.
The canopy cover enhancements do not include increases through underplanting. The Etobicoke Creek Watershed Future Management Scenario Analysis Report (Table 18 Urban Forest Planting Assumptions) provides further information on tree planting assumptions and densities.

Available planting areas vary greatly if social and municipal criteria are considered in addition to ecological and hydrological criteria. For example, and as shown in **Table 17**, the Headwaters has a much lower number of trees in Tier 1 compared to Tier 2.

A total of 288.6 hectares of additional canopy cover can be added based on this tiered approach.

TABLE 17:
Canopy Cover Enhancements by Tier

Subwatershed	Current Canopy Cover	Tier 1 and 2 Canopy Cover	Tier 1 (Number of Trees)	Tier 2 (Number of Trees)
Headwaters	12.9%	13.3%	16	3,808
Little Etobicoke	14.0%	15.1%	1,779	5,337
Lower Etobicoke	22.9%	23.3%	–	2,809
Main Branch	14.2%	15.0%	2,924	2,741
Spring Creek	14.5%	16.0%	5,326	6,822
Tributary 3	6.5%	12.2%	6,864	3,395
Tributary 4	13.3%	14.7%	10	2,222
West Branch	17.9%	19.6%	10,288	3,757
TOTALS	**14.6% (watershed)**	**15.9% (watershed)**	**27,208**	**30,891**

Note:
Urban tree planting costs are contingent on current market prices of stock and market conditions.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Conservation
Authority

Toronto and Region Conservation Authority

Etobicoke Creek Watershed Plan
Engagement Summary 3

August 2022 – March 2024

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1.0 SUMMARY

The development of the Etobicoke Creek Watershed Plan (ECWP) was initiated in 2020 by Toronto and Region Conservation Authority (TRCA) in partnership with a Steering Committee consisting of Mississaugas of the Credit First Nation, the Greater Toronto Airports Authority, and staff from the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, and Town of Caledon.

Watershed planning provides a systematic and comprehensive framework for ensuring healthy watersheds. Watershed planning helps to characterize current watershed conditions, provide insight on the future conditions of the watershed based on potential future land use and climate scenarios, and identify measures to protect, enhance, and restore the health of the watershed to ensure long-term sustainability and resiliency. Watershed plans do not make land use and infrastructure planning decisions. Rather, they are intended to help municipalities make informed decisions on where and how to grow in a way that minimizes and/or mitigates impacts to watershed health. Watershed plans also help inform other TRCA and municipal initiatives including ecosystem restoration and management, land management and acquisition, best practices for rural land use, low impact development and green infrastructure implementation, and climate adaptation.

The development of the ECWP has been a multi-year process and included the following stages: Stage 1 – Preparation and Scoping (2020), Stage 2 – Watershed Characterization (2020-2021), Stage 3 – Future Management Scenarios (2021-2022), and Stage 4 – Implementation Planning/Development of the ECWP (2022-2024).

Engagement with First Nations and Indigenous Communities as well as broader engagement with partners, watershed stakeholders, residents, and the public is an important part of the watershed planning process. Effective and meaningful engagement leads to improved watershed planning outcomes. It helps facilitate community buy-in and strengthen support from First Nations and Indigenous communities as well as from key watershed stakeholders, residents, and the public. This helps to garner broader support from policy makers and to facilitate effective implementation by relevant partners. Since the development of watershed plans is a multi-year, collaborative initiative, regular engagement is vital to the successful development and eventual implementation of a watershed plan.

The objectives for engagement throughout this watershed planning process have been:

- To build relationships with First Nations and Indigenous communities within the watershed as well as to build partnerships with key watershed stakeholders, residents, and the public and identify opportunities for collaboration, coordination, and strategic resource-sharing to improve watershed health.
- To build community awareness on the importance of healthy watersheds and identify opportunities for improved community stewardship of the Etobicoke Creek watershed.
- To achieve broader endorsement of watershed plan goals, objectives, and management actions to increase the likelihood of effective implementation.

Regular project updates at key milestones (and for any engagement activities) have been posted on the **project webpage** and on social media throughout the watershed planning process. The updates, and opportunities for input, have been provided through notifications to:

- First Nations and Indigenous communities
- local and regional municipal Councillors whose wards have boundaries within the watershed
- TRCA Board members
- Regional Watershed Alliance members
- ECWP webpage subscribers list (via Mailchimp)
- watershed stakeholders, residents, and other members of the public on the project stakeholder list

Engagement notifications/project updates have also been circulated to ECWP Steering Committee members for distribution through their channels, as appropriate, to ensure maximum public exposure, and to various TRCA teams for distribution through their mailing lists and newsletters. Questions, comments, and information requests were also submitted to the project team throughout the watershed planning process via the project email (etobicoke@trca.ca).

This engagement summary document provides an overview of engagement activities conducted for the ECWP between August 2022 and March 2024 (near the end of the Implementation Planning stage of the watershed planning process). It includes a description of key engagement/outreach events, an overview of the Summer/Fall 2023 engagement activities (and results) for the draft ECWP, details of the engagement feedback received during the 60-day public review period (August 1 to September 23, 2023) for the draft ECWP, a summary of the key changes made to the ECWP based on engagement feedback, and general information on correspondence and regular project updates.

2.0 ENGAGEMENT

Engagement is an important part of the watershed planning process and has taken place throughout the development of the ECWP with watershed stakeholders (including Building Industry and Land Development Association and other developers in the watershed, community/resident groups, golf courses, major private landowners, non-governmental organizations, etc.), residents, and members of the public, and through notifications/updates to local and regional municipal Councillors whose wards have boundaries within the watershed, TRCA Board members, and Regional Watershed Alliance members.

Engagement has also taken place throughout the watershed planning process with First Nations and Indigenous communities with Treaty rights (Mississaugas of the Credit First Nation) and/or traditional territory within the watershed (including Williams Treaties First Nations, Huron-Wendat Nation, Six Nations of the Grand River, and Métis Nation of Ontario). The aim of this engagement was to begin to build a long-term relationship and engage meaningfully with each First Nation and Indigenous community as the ECWP was developed and to receive input and feedback on concerns/priorities for the watershed. Throughout the watershed planning process for the

ECWP, First Nations and Indigenous communities were kept informed of major milestones and provided with opportunities to provide comments and input. Feedback on the draft ECWP was sought in May 2023 from First Nations and Indigenous communities prior to the public release of the draft ECWP in August 2023. Engagement with First Nations and Indigenous communities will continue during implementation of the ECWP.

This engagement summary document provides an overview of engagement activities conducted for the ECWP between August 2022 and March 2024 (near the end of the Implementation Planning stage of the watershed planning process). It includes the Summer/Fall 2023 engagement activities (and results of engagement) aimed at soliciting feedback/input from watershed stakeholders, residents, and the public on the draft ECWP (including the management framework outlined in the draft ECWP).

The key engagement activities and results discussed in the next sections include:

- Key engagement/outreach events such as Bike the Creek (June 10, 2023), a municipal Councillor community BBQ (September 16, 2023), a Mississaugas of the Credit First Nation Community BBQ (September 19, 2023), a community watershed circle (October 12, 2023), and a watershed tour (October 17, 2023).
- Engagement activities that took place during the 60-day public review period (August 1 to September 29, 2023) for the draft ECWP including engagement notifications, social media/media advisory campaign, online interactive ECWP, online webinars (September 12 and 13, 2023), and in-person open houses (September 18 and 19, 2023).
- Details of the engagement feedback received during the 60-day public review period for the draft ECWP and summary of the key changes made to the ECWP based on engagement feedback.

A detailed record of all engagement as well as other correspondence and regular project updates for the period from August 2022 to March 2024 is outlined in **Appendix A: Engagement Summary Record.**

This **Engagement Summary 3** document will be posted on the **project webpage**. Engagement notifications will be circulated to advise of the release of the **Engagement Summary 3** (along with the final ECWP, once approved) and the completion of the Implementation Planning stage.

3.0 KEY ENGAGEMENT / OUTREACH EVENTS

3.1 Bike the Creek (June 10, 2023)

TRCA's Watershed Planning and Reporting Team, in collaboration with the Education and Training Team, hosted a booth at Bike the Creek on June 10, 2023, at the Jim Archdekin Recreation Centre in Brampton. Established in 2014, Bike the Creek is a well-attended community event planned with partners including Bike Brampton, City of Brampton, City of Mississauga, and the Town of Caledon.

The main purpose of the booth was to provide information to participants about the watershed planning process and the Etobicoke Creek watershed, to advise them of the release of the draft ECWP for the 60-day

public review period beginning in August 2023, and to encourage participants to provide input on the draft ECWP. Approximately 60 people were directly engaged at the booth.

The booth included information and materials such as:

- A large Etobicoke Creek watershed map.
- A large" What is a watershed" information graphic.
- A factsheet on integrated watershed planning with details about the Etobicoke Creek watershed and the development of the draft ECWP.
- Postcards with a link to the ECWP project webpage.

3.2 Municipal Councillor Community BBQ (September 16, 2023)

TRCA's Watershed Planning and Reporting Team, in collaboration with the Education and Training Team, hosted a booth at Mississauga Councillor Chris Fonseca's Community BBQ event on September 16, 2023 at Fleetwood Park in Mississauga.

The main purpose of the booth was to provide information to participants about the watershed planning process and the Etobicoke Creek watershed, and to encourage them to review and provide input on the draft ECWP before the end of the public review period (September 29, 2023).

The booth included information and materials such as:

- A large Etobicoke Creek watershed map.
- A large" What is a watershed" information graphic.
- A factsheet on integrated watershed planning with details about the Etobicoke Creek watershed and the development of the draft ECWP.
- The draft ECWP.
- Postcards with a link to the ECWP project webpage, with details pertaining to the draft ECWP review period.

Approximately 150 people were directly engaged at the booth. The following comments were received from participants which were shared with staff at the City of Mississauga (including the Forestry team) on September 25, 2023.

- One resident expressed concern about the dead trees/snags, dried branches/brush, and overgrowth in the ravine near Etobicoke Creek close to Fleetwood Park and was concerned that this has created a fire hazard. The resident noted that teenagers in the area set off fireworks which adds to the fire risk and inquired about an emergency response (fire) plan for this area, access for emergency response vehicles, and response times due to the isolated location and access difficulties (potential need for aerial response to a wildfire).

- Another resident expressed concern about overgrowth of trees/shrubs/brush on the trails closer to the airport.

3.3 Mississaugas of the Credit First Nation Community BBQ (September 19, 2023)

TRCA staff attended a community BBQ hosted by Mississaugas of the Credit First Nation on September 19, 2023 and were able to engage with approximately 50 community members to raise awareness about watershed planning and other TRCA projects.

3.4. Community Watershed Circle (October 12, 2023)

TRCA staff participated in a community watershed circle "In Flow for Etobicoke Creek" hosted by Our Future First and Turtle Island Carers of Fire on October 12, 2023 at the Franklin Horner Community Centre in Etobicoke. The watershed circle was a small, community dialogue and workshop focused on Indigenous teachings and values which allowed participants to share stories about Etobicoke Creek and how watershed health relates to personal well-being. Using graphic cards inspired by the United Nations Sustainable Development Goals (SDGs), participants reflected on the local culture, economy, ecology, and social life and shared ideas about protecting and restoring the Etobicoke Creek watershed.

3.5 Watershed Tour (October 17, 2023)

TRCA staff hosted a tour of the Etobicoke Creek watershed on October 17, 2023 for TRCA Board members, municipal Councillors, municipal senior leadership staff, and ECWP Steering Committee members. The tour included visiting three locations within the watershed (from the Headwaters in Caledon to the mouth of the creek in Toronto) and highlighted partnerships and key messages/priority areas from the ECWP with a focus on watershed issues (such as stormwater management, erosion, flood vulnerable areas, aquatic barriers, restoration opportunities, etc.).

4.0 ENGAGEMENT ACTIVITIES FOR THE DRAFT ECWP

A variety of engagement methods were used during the 60-day public review period for the draft ECWP to reach as many watershed stakeholders, residents, and members of the public as possible, to obtain valuable feedback on the draft ECWP, and to raise awareness of watershed issues.

Engagement activities/methods (in addition to participation at engagement/outreach events outlined above) included direct engagement notifications (via email/letters and through the project webpage), social media posts on a variety of platforms and distribution of a media advisory, the online interactive ECWP, two online webinars (with presentation and interactive sessions), and two in-person open houses.

Watershed stakeholders, residents, and the pubic were encouraged to review the draft ECWP and provide feedback/comments using the online and hard copy comment form or via email. See **Section 5.0 Draft ECWP Public Review Feedback Summary and ECWP Key Changes** for details about the comments received during the public review period and the project team's responses. All the input received during the review period was considered and the ECWP was updated accordingly.

4.1 Engagement Notifications

Engagement notifications advising of the 60-day public review period for the draft ECWP and encouraging feedback were sent directly via email and/or letter in July 2023 prior to the beginning of the public review period to the following:

- First Nations and Indigenous communities
- local and regional municipal Councillors whose wards have boundaries within the watershed
- TRCA Board members
- Regional Watershed Alliance members
- ECWP webpage subscribers list (via Mailchimp) (reminder notification sent September 8, 2023 prior to end of public review period)
- Watershed stakeholders (including Building Industry and Land Development Association and other developers in the watershed, community/resident groups, golf courses, major private landowners, non-governmental organizations, etc.), residents, and other members of the public on the project stakeholder list (reminder notification sent September 8, 2023 prior to end of public review period)
- Various TRCA teams for distribution through their mailing lists and newsletters (including Communications, Marketing and Events; Education and Training; Sustainable Neighborhood Action Program (SNAP); Professional Access Into Employment (PAIE); Newcomer Youth Green Economy Project (NYGEP); Multicultural Connections Program (MCP); and, Partners in Project Green (PPG))
- ECWP Steering Committee members for distribution through their channels (including social media feeds), as appropriate, to ensure maximum public exposure

The notifications directed people to the ECWP project webpage which contained all the relevant engagement information including the details and registration information for the online webinars and in-person open houses, a link to the draft ECWP, a link to the online interactive draft ECWP, a recorded presentation, a Frequently Asked Questions page, and a one-page factsheet with highlights from the ECWP.

4.2 Social Media / Media Advisory Campaign

TRCA conducted an extensive social media campaign to advise watershed stakeholders, residents, and the public about the review period for the draft ECWP and to encourage input. The campaign included numerous posts on various social media platforms including Twitter, Instagram, Facebook, and LinkedIn (15, 981 impressions and 156 link clicks). Some additional paid social media advertisements were posted on Instagram and Facebook to boost views (with 171, 738 impressions and 2,064 link clicks).

A media advisory with information about the draft ECWP, the public review period, and engagement activities was also sent to over 80 news outlets.

4.3 Online Interactive Etobicoke Creek Watershed Plan

TRCA developed an online interactive version of the ECWP to provide an alternate way for watershed residents, the public, and stakeholders to view and explore the ECWP. This online interactive ECWP was available through the project webpage and included a summary the ECWP contents, the ECWP maps, and a map viewer which allowed exploration of the various mapping layers and priority areas from the ECWP maps. The data shown in the ECWP maps is available on TRCA's Open Data Portal.

4.4 Online Webinars (September 12 and 13, 2023)

Two online webinars were held in mid-September. The webinars were hosted by a member of TRCA's Education and Training Team and featured a presentation by the ECWP Project Manager (Watershed Planning and Reporting Team) which provided an overview of the watershed planning process, and information on the Etobicoke Creek watershed, the development of the ECWP and key findings, the ECWP contents including priority areas/actions, how to provide comments, and next steps. Two interactive sessions were included in the webinars. The first interactive session took place prior to the presentation and asked participants to answer three polling questions. The second interactive session took place after the webinar presentation using Mentimeter (an interactive presentation software). A question-and-answer period was held at the end of the webinars with a panel consisting of staff from TRCA's Watershed Planning and Reporting, Ecosystem and Climate Science, Water Resource Engineering, Policy Planning, and Planning Ecology Teams, as well as municipal staff.

The first webinar was held at lunchtime (12:00 to 1:00 p.m.) on September 12, 2023 and had 12 participants (27 registrants). The second webinar was held in the evening (7:00 to 8:00 p.m.) on September 13, 2023 and had six participants (20 registrants). The drop-off rate from registrants to the number of participants was typical of other webinars held by TRCA.

4.4.1 Webinar Polling Questions and Results

Three polling questions were asked prior to the webinar presentation. A summary of these three initial polling questions and responses at each webinar is shown in **Table 1.**

Table 1: Summary of Pre-Presentation Webinar Polling Questions and Responses (Sept. 12 and 13, 2023 Webinars)

Pre-Presentation Polling Question	September 12, 2023 Lunch Webinar - Count of Responses	September 13, 2023 Evening Webinar - Count of responses
What city or town are you joining the webinar from today?	City of Brampton - 2 Town of Caledon - 1 City of Toronto - 4 Other - 1	City of Brampton - 1 City of Toronto - 2
How did you hear about this webinar?	Email - 7 Other - 1	Email - 2 Word of Mouth - 1 Social media - 1
Do you live or work within the Etobicoke Creek watershed?	Yes - 6 No - 1 Unsure - 1	Yes - 1 Unsure - 3

In addition, 10 polling questions were asked during the interactive Mentimeter session after the presentation. A summary of these 10 polling questions and responses received is provided in **Appendix B: Draft ECWP Webinar Polling Results.** The key messages highlighted included:

- The importance of the Etobicoke Creek watershed for both nature and recreational opportunities (with favourite activities being bird watching, biking, and walking, and favourite places in the watershed including the mouth of Etobicoke Creek, Marie Curtis Park, and Heart Lake).
- Most participants found the draft ECWP to be either 'somewhat easy to read and understand' or 'easy to read and understand', and the webinars were either 'effective' or 'somewhat effective' in improving their understanding of the draft ECWP.
- The top key issues of concern outlined in the ECWP included loss and degradation of natural cover and connectivity, poor aquatic habitat and instream barriers, flooding and high surface runoff, and poor water quality.
- Most participants believed that all three of the goals outlined in the ECWP (Land Use, Natural Heritage System/Urban Forest, and Water Resource System) are equally important.
- The priority areas most important to help focus implementation efforts included priority areas for restoration and for stormwater management green infrastructure.
- The majority of participants felt that municipalities and TRCA should do more than they currently are to implement watershed plans.
- The preferred methods to be kept informed of ECWP implementation included email subscriber list/stakeholder list, establishment of a Stakeholder Advisory Committee, and project webpage updates.

4.4.2 Webinar Q&A

Table 2 outlines all the questions received during the Q&A sessions at the two webinars and the responses provided by the project team panel.

Table 2: Questions and Responses during the Q&A Sessions at the September 12 and 13, 2023 Webinars

Questions	Responses
Is this planning process unique to TRCA, or is it the same as is applied to watersheds across Ontario?	The watershed planning process that TRCA follows is directed by provincial guidance. Overall, the process generally stays the same across the province, but depending on the capacity, data, and technical expertise the organization may have, the level and intensity may differ. TRCA is fortunate to have extensive data and expertise to develop an extensive plan in partnership with our municipal partners. TRCA also coordinates with nearby Conservation Authorities to keep informed of various initiatives.
Has the watershed plan taken into consideration that parts of Etobicoke Creek are identified as drainage channels under the provincial *Drainage Act*? What are the potential impacts and mitigation measures included in the Watershed Plan to address this?	Municipal drains are present within the Etobicoke Creek watershed. This data has been included in the data collection and analysis for the ECWP. In terms of management or potential impact mitigation, it would be the same as a natural watercourse. The ECWP provides information at a watershed level, but then additional studies at the subwatershed level occur that help focus on more specific areas.
What stage in the planning process are we at currently?	We have completed the first three stages (scoping, watershed characterization, and future management scenario analysis). This information helps inform Stage 4 (current stage) which is Implementation Planning. This stage involves developing a detailed management framework to help focus implementation efforts as well as developing the draft ECWP. Once we collect input during the public review period for the draft ECWP, we will consider those comments and finalize the plan. Approval will then be sought from municipalities and the TRCA Board.

If I want to volunteer, what kind of activities/role will the person be involved in for the watershed plan development.	Please reference TRCA's **Get Involved** webpage for information about events in the watersheds across the Toronto region, and to learn more. TRCA also has a **volunteer with TRCA** webpage that lists the latest volunteer opportunities available. In terms of volunteering with the implementation of the ECWP, TRCA will be investigating mechanisms to continue to receive input during implementation, to provide updates on implementation progress, and ways to participate/engage more directly in various implementation activities.
How are the future scenario results forecasted? How do you compare the possible impacts of the different scenarios?	Four future management scenarios representing different levels of urbanization, climate change, and gradual progressions of enhancements are modelled and assessed. This allows us to determine under each of the scenarios if watershed conditions were improving, deteriorating, or staying the same. These results help inform the management actions. Please see the **Etobicoke Creek Watershed Future Management Scenario Analysis Report** for more detailed information.
As a real estate developer with properties adjacent to the Etobicoke Creek that are subject to severe flooding, how can we collaborate with TRCA to ensure the current draft study will consider these risk areas? Especially adjacent areas that are already zoned mixed-use and can provide the much-needed housing but are compromised due to flood zones?	TRCA and municipalities work closely on these types of initiatives to ensure development occurs safely and the risk associated with flooding and erosion issues does not increase. In terms of development on hazard lands, Mississauga has a policy about this. Developers can meet with municipal staff to explore challenges/opportunities.
What can homeowners do to contribute to the health of the watershed?	• Increase urban forest canopy cover by planting on your property • Plant rain gardens to allow precipitation to infiltrate into the soil • Reduce salt application on properties • Use rain barrels to harvest rainwater and use it in your garden • Plant pollinator gardens • Familiarize yourself with the ECWP to have an overall understanding of the recommendations in the plan • Visit TRCA's **Get Involved** webpage for information on events and to learn more

There continues to be a terrible impact on Mimico Creek after the 6-alarm fire upstream at the chemical plant. Communication from the city has been sporadic and vague. Is there a source to go to learn more about ongoing water quality issues in our Toronto waterways?	Although not within the Etobicoke Creek watershed, this occurred in the Mimico Creek watershed nearby. TRCA has been supporting the Ministry of Environment, Conservation, and Parks (MECP) (lead on spill response) by collecting data and providing it to both MECP and City of Toronto. The company responsible for the spill also has a hotline that can be called.
I saw butternuts listed as species being tracked. I know of several butternut trees below the QEW along the creek. Is there a map, document tracking these trees and other species? I'd love to add what I can.	Applications for citizen/community science apps such as **I Naturalist** are a great resource for citizens to help track species.

4.5 In Person Open Houses (September 18 and 19, 2023)

Two in-person open houses were held in September 2023 to provide an overview of the draft ECWP and to encourage input. To reach the widest possible audience across the watershed, the open houses were held in the lower (Mississauga) and upper middle (Brampton) reaches of the watershed. There were 14 participants at the Mississauga Open House on September 18, 2023, and seven at the Brampton Open House on September 19, 2023.

Posters were displayed at each open house and included information about the following:

- watershed planning process
- Etobicoke Creek watershed
- development of the ECWP
- results of watershed characterization and future management scenario analyses
- Water Resource System and Natural Heritage System
- management framework for the draft ECWP including goals, objectives, and indicators
- key maps and priority areas from the draft ECWP
- monitoring and evaluation of watershed conditions
- details on how to submit comments on the draft ECWP and next steps

Three large maps were also provided displaying current land use, the Water Resource System, and the Natural Heritage System in the watershed. Participants were encouraged to add comments directly on the map, or to leave post-it notes regarding any watershed concerns, or general comments.

4.5.1 Open House Comments and Responses

Three comments were provided on the maps at the Mississauga Open House, while none were provided at the Brampton Open House. A summary of the comments provided on the maps, as well as responses are outlined in **Table 3** below.

As discussed in **Section 5.0 Draft ECWP Public Review Feedback Summary and ECWP Key Changes**, in addition to the comments provided on the maps, one ECWP hard copy comment form was submitted at the Brampton Open House and one was submitted at the Mississauga Open House. These comments as well as responses are included in **Appendix C: Feedback on Draft ECWP and Responses.**

Table 3: Summary of Comments Received on Maps at Open Houses and Response

Comment	Response
Is there an opportunity here for a targeted campaign aimed at residential/industrial to garden with native plants and be part of the plan?	Watershed stakeholders and residents are encouraged to visit TRCA's **Get Involved** webpage for information about events in the watersheds across the Toronto region, and to learn more. Workshops and webinars are provided about planting with native species (including wildflowers). TRCA also has a **volunteer with TRCA** webpage that lists the latest volunteer opportunities available. The ECWP includes two management actions that will help encourage planting with native (or non-invasive) species. Management Action 3.1.5 involves municipalities, TRCA, and the Greater Toronto Airports Authority collaborating, when possible, to manage problematic invasive species. Management Action 3.2.3 focuses on the development of urban forest management plans/strategies that encourage an urban forest in the watershed with diverse and native (or non-invasive) tree species and class sizes, and that develop or expand programs for native tree planting on public and private lands. TRCA will also continue to work in collaboration with our partner municipalities on various restoration/planting programs and initiatives in the watershed which will include plantings with native species and invasive species management.
Are there opportunities for community aid/engagement to support plans? What can we do to help? It would be good to promote accountability.	Watershed stakeholders and residents are encouraged to visit TRCA's **Get Involved** webpage for information about events in the watersheds across the Toronto region, and to learn more. TRCA also has

Comment	Response
	a volunteer with TRCA webpage that lists the latest volunteer opportunities available. In terms of ECWP implementation, the Implementation Steering Committee (to be established to help guide implementation) will establish mechanisms to continue to receive input from watershed stakeholders, residents, and the public, and to provide updates on implementation progress and ways to participate and engage more directly in various implementation activities.
Would love to see aquatic health monitored annually. It seems of major importance.	TRCA is currently reviewing the monitoring programs and data requirements for watershed plans. Frequency of monitoring is one of the areas that is being reviewed to ensure the appropriate data is being collected at the appropriate times and locations, based on available capacity and funding.

5.0 DRAFT ECWP PUBLIC REVIEW FEEDBACK SUMMARY AND ECWP KEY CHANGES

During the public review period for the draft ECWP (August 1 to September 29, 2023), comments were received from watershed stakeholders, residents, and the public through the online comment form (16 submissions), hard-copy comment form at the two in-person open houses (2 submissions – 1 at each Open House), and direct email (1 submission).

Using the online and hard-copy comment form, respondents were able to rate the draft ECWP based on three questions. **Table 4** summarizes the three questions and the ratings received on these questions via the comment forms.

Table 4: Responses to Rating the Draft ECWP

	How would you rate the structure, length, and organization of the draft ECWP on a scale of 1 to 5? (1 - poor, 5 - excellent)?	Is the information in the draft ECWP presented clearly and concisely? Please check the appropriate box: not at all concise or concise, somewhat unclear and lengthy, neutral, somewhat clear and concise, very clear and concise. Rated on a scale of 1 to 5, where 1 equals "not at all clear and concise" and 5 equals "very clear and concise".	Do you support the goals, objectives, indicators, and management actions in the draft ECWP? Please check the appropriate box: very opposed, somewhat opposed, neutral, somewhat supportive, very supportive. Rated on a scale of 1 to 5, where 1 equals "very opposed" and 5 equals "strongly supportive".
Average Rating	3.6	3.7	4.2

Note: 17 submissions answered all three of these questions, one submission only answered one of these questions, and one submission didn't answer any of these questions.

In addition to the three ratings questions, respondents were able to provide general comments on the draft ECWP as well as comments on the specific sections of the draft ECWP. **Appendix C: Feedback on Draft ECWP and Responses** presents all the comments received through the online and hard copy comment form and via direct email, notes whether they are general comments or specific to a section of the draft ECWP, provides responses to the comments, and notes whether the comments resulted in updates to the ECWP. Comments are presented in no particular order.

Edits were made to the draft ECWP to incorporate feedback received during the public review period (see **Appendix D: Summary of Key Changes to the ECWP)**, where appropriate. The draft ECWP and the updated ECWP (version to be taken to municipal committees/Councils for endorsement/support) can be viewed on the project webpage. The final/approved ECWP will be posted once available. The online interactive ECWP provides an alternate way to view the ECWP and includes a map viewer so readers can explore key maps and mapping layers from the ECWP Maps.

6.0 CONCLUSION

Engagement is an important part of the watershed planning process and has taken place throughout the development of the ECWP with First Nations and Indigenous communities as well as with watershed stakeholders, residents, and members of the public, and through notifications/updates to local and regional municipal Councillors whose wards have boundaries within the watershed, TRCA Board members, and Regional Watershed Alliance members.

This engagement summary document provides an overview of engagement activities conducted for the ECWP between August 2022 and March 2024 (near the end of the Implementation Planning stage of the watershed planning process). It includes a description of key engagement/outreach events, an overview of the Summer/Fall 2023 engagement activities (and results) for the draft ECWP, details of the engagement feedback received during the 60-day public review period (August 1 to September 23, 2023) for the draft ECWP, a summary of the key changes made to the ECWP based on engagement feedback, and other general information on correspondence and regular project updates.

Multiple engagement methods were used to ensure the greatest degree of engagement and input on the draft ECWP possible during the public review period including engagement notifications, social media/media advisory campaign, online interactive ECWP, online and hard-copy comment form, direct email, online webinars, and in-person open houses. Feedback/comments received during the 60-day public review period provided valuable input to the ECWP. All of the feedback provided was considered and the ECWP was updated accordingly.

The most popular method of engagement for the draft ECWP was through the online comment form, which was available through the project webpage. **Appendix C: Feedback on Draft ECWP and Responses** presents all the comments received as well as responses to the comments. Some respondents noted the importance of many of the priority actions outlined in the management framework (including LID/green infrastructure implementation, reduction in impervious cover, aquatic health, naturalization and restoration in the watershed, land acquisition, trail network, invasives species management, and spills management) and the need to include/clarify the following in the ECWP:

- Include information on implementation, tracking, and reporting.
- Emphasize the level of commitment required by TRCA, municipalities, and other partners/stakeholders to ensure successful implementation of the ECWP, and the role of municipalities in the development and implementation of the ECWP.
- Clarify that the ECWP outlines the actions required to protect, enhance, and restore watershed health at the watershed-scale, and that detailed site-level investigations and technical studies (as appropriate and as part of subwatershed planning, environmental assessments, development and planning applications/approvals, etc.) will be required to obtain local/site level information to help inform and assess the suitability for implementation of some of the management actions.
- Clarify the purpose of the future management scenario analysis stage.

- Simplify the messages in the ECWP and during the engagement presentations, and provide online/interactive maps.

The online webinars and in-person open houses provided additional opportunities for public/stakeholder engagement and input on the draft ECWP. Although attendance at these events was fairly low (perhaps due to fatigue from online webinars and meetings), the feedback obtained from participants on the draft ECWP was important.

This **Engagement Summary 3** document will be posted on the **project webpage**. Engagement notifications will be circulated to advise of the release of the **Engagement Summary 3** (along with the final ECWP, once approved) and the completion of the Implementation Planning stage.

Throughout 2024, TRCA and our municipal partners will be taking the ECWP to various municipal committees/Councils for endorsement/support, and to TRCA's Board of Directors for approval. Once final approvals/support and endorsements have been obtained later in 2024, implementation of the watershed plan will begin. The ECWP is intended to be in effect for 10 years from when it is finalized and approved. Collaborative and comprehensive implementation, tracking, and reporting of all aspects of the management framework will be essential to fully realize the vision for the watershed and to improve watershed health and ensure sustainability of its ecosystem services for current and future generations.

An **Implementation Steering Committee** consisting of TRCA, our partner municipalities, Mississaugas of the Credit First Nation, and the Greater Toronto Airports Authority will be established later in 2024 to guide and support implementation and will be facilitated by TRCA. The Implementation Steering Committee will develop mechanisms to continue to receive input from First Nations and Indigenous communities and from watershed stakeholders, residents, and the public, and to provide updates on implementation progress and ways to participate and engage more directly in various implementation activities.

APPENDIX A: ENGAGEMENT SUMMARY RECORD

The following table presents a record of the engagement for the ECWP for the period from August 2022 to March 2024. Key engagement activities/project milestones are highlighted.

Date	Engagement Activity
September 2022	Project webpage updates including release of the Future Management Scenario Analysis Report and Engagement Summary 2.
September 8, 2022	Email correspondence with Citizens Concerned About the Future of the Etobicoke Waterfront about the status of the Toronto Golf Club weir (response provided in October 2022).
September 21, 2022	ECWP Steering Committee Meeting
September 22, 2022	Email to local and regional Councillors with an ECWP update regarding completion/release of Scenario Analysis Report and Engagement Summary 2.
September 23, 2022	Email to TRCA Board members and Regional Watershed Alliance members with an ECWP update regarding completion/release of Scenario Analysis Report and Engagement Summary 2.
September 28, 2022	Email to ECWP webpage subscribers with an ECWP update regarding completion/release of the Scenario Analysis Report and Engagement Summary 2.
September 30, 2022	Email to ECWP stakeholder list with an ECWP update regarding completion/release of Scenario Analysis Report and Engagement Summary 2.
October 14, 2022	Email to Mississaugas of the Credit First Nation with an ECWP update regarding completion/release of Scenario Analysis Report and Engagement Summary 2, and inquiry about continued participation on ECWP Steering Committee.
October 18, 2022	Email to First Nations and Indigenous communities with an ECWP update regarding completion/release of Scenario Analysis Report and Engagement Summary 2.
October 26, 2022	ECWP Steering Committee Workshop – Collaborative Development of Management Framework for ECWP
March 3, 2023	ECWP Steering Committee Workshop – Collaborative Development of Management Framework for ECWP and Draft Watershed Plan
April 19, 2023	Meeting with Mississaugas of the Credit First Nation to discuss engagement for the draft ECWP (and for the Humber River Watershed Plan) and ways to strengthen engagement with Mississaugas of the Credit First Nation for watershed plan development and implementation moving forward.

Date	Engagement Activity
May 24, 2023	Email (and letters) to First Nations and Indigenous communities providing the draft ECWP for their feedback as well as information regarding the upcoming public review period. Extended offer to schedule meetings to provide more information on the draft ECWP and to discuss how each First Nation and Indigenous Community can participate in finalizing the draft ECWP prior to the public review period.
May 25, 2023	Email correspondence with Hiawatha First Nation noting that they have perused the draft ECWP and will review further in depth, and asking about the Provinces MZO's and impacts on the greenbelt/wetlands and the steps to be taken to protect the cumulative damage to the watershed (response provided May 31, 2023).
May 31, 2023	Presentation to the Regional Watershed Alliance to provide an overview of TRCA's integrated watershed planning process and an update on the status of the development of the Etobicoke Creek and Humber River watershed plans and the implementation of the Carruthers Creek Watershed Plan.
June 1, 2023	Email correspondence with Chippewas of Rama First Nation who confirmed no comments/concerns on the draft ECWP.
June 10, 2023	Participation at Bike the Creek to provide information to participants on the watershed planning process, the Etobicoke Creek watershed, and the development and review period for the draft ECWP.
June 19, 2023	Email correspondence with a resident regarding debris in Mimico Creek and the regulation/rules about illegal dumping (response provided June 21, 2023).
June 23, 2023	Information report providing TRCA's Board with an update on ECWP development and the proposed 2023 engagement plan for the draft ECWP.
July 24, 2023	Project webpage updates including the public release of the draft ECWP as well as the online comment form, FAQ, ECWP fact sheet, and online interactive ECWP, and additional information pertaining to the draft ECWP and engagement events. TRCA Events Calendar updated with webinar and open house information/registration.
July 26, 2023	Email to TRCA Board members, local and regional Councillors, and RWA members with notification of the completion/release of the draft ECWP and the 60-day public review period, and details about how to learn more/provide input through various engagement activities. It was requested that they share information through their channels regarding engagement activities.
July 26, 2023	Email from Councillor Dasko's office in response to ECWP update and confirmation that the Councillor will include the information on his website and August/September e-newsletter, and will join one of the online webinars and attend the in-person open house on September 18.
July 26, 2023	Email with an RWA member (and founder of Our Future First) regarding proposal involving hosting watershed-based civic circles as a dialogue process that could be offered in addition to the combination of engagement methods and activities designed for receiving input/feedback on the draft ECWP (and other watershed plans). Discussions continuing regarding community watershed circles to engage First Nations and Indigenous communities and other involved community members in more meaningful engagement of watershed plans.

Date	Engagement Activity
July 27, 2023	Email to ECWP stakeholder list with notification of the completion/release of the draft ECWP and the 60-day public review period, and details about how to learn more/provide input through various engagement activities.
July 27, 2023	Email to TRCA Education and Training team, Sustainable Neighborhood Action Program (SNAP), Professional Access Into Employment (PAIE), Newcomer Youth Green Economy Project (NYGEP), Multicultural Connections Program (MCP), and Partners in Project Green (PPG) providing information regarding the completion of the draft ECWP and the 60-day public review period to be distributed through their networks/newsletters.
July 27, 2023	Email correspondence to First Nations and Indigenous communities (as follow-up to May 24, 2023 emails/letters seeking feedback on the draft ECWP) indicating that the draft plan is available online for a 60-day public review period and that TRCA remains available to discuss the draft plan in more detail and obtain input.
July 28, 2023	Email correspondence with Hiawatha First Nation who confirmed they have no questions/concerns on the draft ECWP but will contact the project team if any questions arise.
July 28, 2023	Email correspondence with Six Nations of the Grand River who noted that they will comment on the draft ECWP by the end of September if they have capacity.
July 28, 2023	Email to ECWP webpage subscribers list with notification of the completion/release of the draft ECWP and the 60-day public review period, and details about how to learn more/provide input through various engagement activities.
July 28, 2023	Email correspondence with Four Colours Drum Circle thanking the project team for the information about the draft ECWP and the public review period.
August 1, 2023	Social media posts with links to project webpage (and information on the draft ECWP, online comment form, webinar registration, and other engagement details for the 60-day public review period).
August 1, 2023	Delegation/Presentation/Q&A on the draft ECWP to Brampton Environment Advisory Committee, and encouraging input on the draft ECWP.
August 3, 2023	Email invitation from Lost Rivers Toronto to a walking tour of the Lower Etobicoke Creek and opportunity to address attendees (response provided August 8 and October 19, 2023).
August 7, 2023	Social media post with the link to the new online interactive ECWP.
August 11, 2023	Social media post with a 7-week countdown graphic and links to project webpage with draft ECWP and engagement details for the 60-day public review period.
August 16, 2023	Email of Monitoring Matters E-Newsletter (Summer Edition) with information regarding the draft ECWP 60-day public review period and engagement activities.
August 22, 2023	Steering Committee Meeting – Dry-Run for ECWP Online Webinars

Date	Engagement Activity
August 25, 2023	Social media post with a 5-week countdown graphic and links to project webpage with draft ECWP and engagement details for the 60-day public review period.
August 27, 2023	Participation at Celebrate the Humber (King's Mill Park) – 'Exploring Your Watershed' booth to provide information to participants on the watershed planning process and the Humber River and Etobicoke Creek watersheds.
September 2022	Media advisory with information about the draft ECWP, the public review period, and the engagement activities sent to over 80 news outlets.
September 8, 2023	Reminder email to ECWP stakeholder list and to ECWP webpage subscribers list providing information regarding the completion of the draft ECWP and the 60-day public review period, and opportunities for engagement.
September 8, 2023	Correspondence with Ontario Headwaters Institute expressing interest in the draft ECWP and the work that TRCA is completing for watershed plans. Suggested that data on lengths of watercourses that are underground or hardened should be reported on (response via phone call).
September 8, 2023	Social media post with a 3-week countdown graphic and links to project webpage with draft ECWP and engagement details for the 60-day public review period.
September 11, 2023	Social media post with links to register for the September 12 and September 13 webinars.
September 12, 2023	Online webinar held at lunchtime (12:00 to 1:00 pm). The webinar was hosted by a member of TRCA's Education and Training team and featured a presentation by the ECWP Project Manager, Watershed Planning and Reporting, two interactive sessions to obtain input on the draft ECWP, and a Q&A period.
September 13, 2023	Online webinar held in the evening (7:00 to 8:00 pm). The webinar was hosted by a member of TRCA's Education and Training team and featured a presentation by the ECWP Project Manager, Watershed Planning and Reporting, two interactive sessions to obtain input on the draft ECWP, and a Q&A period.
September 14, 2023	Correspondence with Ontario Headwaters Institute inquiring about funding of implementation projects recommended in the draft ECWP (response via phone call).
September 16, 2023	Participation in Councillor Chris Fonseca's Community BBQ (Fleetwood Park) to provide information to attendees on the watershed planning process, the Etobicoke Creek watershed, and the 60-day public review period of the draft ECWP, and to encourage input.
September 17, 2023	Social media post with information for Mississauga ECWP Open House on September 18, 2023.
September 18, 2023	Social media post with information for Brampton ECWP Open House on September 19, 2023.
September 18, 2023	Open House – Mississauga (5:00 to 7:30 pm)
September 19, 2023	Open House - Brampton (5:00 to 7:30 pm)
September 22, 2023	Social media post with a 1-week countdown graphic and links to project webpage with draft ECWP and engagement details for the 60-day public review period.

Date	Engagement Activity
September 28, 2023	Social media post with a 24-hour countdown graphic and links to project webpage with draft ECWP and engagement details for the 60-day public review period.
September 29, 2023	Email correspondence with business owner providing input on the draft ECWP (response provided October 10, 2023, and comment included in **Appendix C**).
September 30, 2023	Social media post indicating that the 60-day public review period for the draft ECWP is now closed and thanking the public for their input.
September 30, 2023	Project webpage updates noting that the 60-day public review period for the draft ECWP is now closed, thanking the public for their input, and providing information on next steps.
October 12, 2023	Participation in community watershed circle “In Flow for Etobicoke Creek” at the Franklin Horner Community Centre in Etobicoke.
October 12, 2023	Email correspondence with a resident regarding stair closure (due to fire damage) and access to Etobicoke trail (response provided October 23 and November 7, 2023 – and concern circulated to City of Mississauga Parks, Forestry, and Environment).
October 17, 2023	Hosted a watershed tour for TRCA Board members, municipal Councillors, municipal senior leadership staff, and ECWP Steering Committee members. Three locations in the watershed were visited to highlight partnerships and key messages/priority areas from the draft ECWP with a focus on watershed issues.
November 23, 2023	Meeting with Toronto Councillor Holyday to provide an overview of the draft ECWP and some of the priority areas identified in the ECWP, and to answer the Councillor’s questions.
January 12, 2024	Email correspondence from Environmental Defence with request to use some of TRCA’s watershed maps in a report regarding Highway 413 impacts on watersheds (response provided March 18, 2024).
February 8, 2024	Meeting with Mississaugas of the Credit First Nation to discuss engagement with them (and the community) as TRCA continues to develop and implement watershed plans.
March 13 and 20, 2024	Participation in Brampton’s Open Houses on the Etobicoke Creek wetlands enhancement project to share information about the Etobicoke Creek watershed and the ECWP.
March 25, 2024	Guest lecture for Toronto Metropolitan University hydrology course with focus on hydrology and water quality science and integration in watershed planning (using the ECWP as a case study).
March 26, 2024	Meeting with Toronto Councillor Morley to provide an overview of the ECWP and some of the priority areas identified in the ECWP, and to answer the Councillor’s questions.
Ongoing	Ongoing correspondence and meetings with ECWP Steering Committee members (including municipal staff) throughout the development of the ECWP.

APPENDIX B: DRAFT ECWP WEBINAR POLLING RESULTS

Ten polling questions were asked during the interactive Mentimeter session after the presentation at the September 2023 online webinars seeking input on the draft ECWP. A summary of these 10 polling questions and responses received is provided below.

Interactive Polling Question 1: What nature or recreational activities do you and/or your family enjoy doing most in the Etobicoke Creek watershed?

Table 5 identifies the popular nature/recreational activities identified by respondents at the September 12 webinar (nine total respondents) and September 13 webinar (five total respondents). The top nature/ recreational activities identified were bird watching, biking, and walking.

Table 5: Summary of Responses to 'What nature or recreational activities do you and/or your family enjoy doing most in the watershed?' (Sept. 12 and 13, 2023 Webinars)

September 12, 2023 Lunch Webinar - Count of Responses (9 total respondents)	September 13, 2023 Evening Webinar - Count of responses (5 total respondents)
• Walking – 4 • Bird watching – 4 • Hiking - 2 • Biking – 1 • Fishing – 1 • Kayaking – 1 • Photography – 1 • Stewardship volunteering -1	• Biking - 4 • Bird watching -2 • Fishing -2 • Walking - 1 • Caring for water - 1

Interactive Polling Question 2: What is your favourite place to visit within the Etobicoke Creek watershed?

Table 6 identifies the favourite places to visit in the watershed identified by the respondents at the September 12 webinar (seven total respondents) and September 13 webinar (four total respondents). The favourite places to visit identified include the mouth of the creek, Marie Curtis Park, and Heart Lake.

Table 6: Summary of Responses to 'What is your favorite place to visit within the Etobicoke Creek watershed?' (Sept. 12 and 13, 2023 Webinars)

September 12, 2023 Lunch Webinar - Count of Responses (7 total respondents)	September 13, 2023 Evening Webinar - Count of responses (4 total respondents)
• Heart Lake - 2 • Humber Bay Park - 1	• At the creek mouth – 3 • Marie Curtis Park - 2

September 12, 2023 Lunch Webinar - Count of Responses (7 total respondents)	September 13, 2023 Evening Webinar - Count of responses (4 total respondents)
• Etobicoke Creek Trail - 1 • Development Sites - 1 • Downtown Brampton Trails - 1 • Wetlands - 1	• Arsenal Lands - 1 • Under the Train Station - 1 • Little Etobicoke subwatershed - 1 • Waterfalls - 1 • The ravine south of Dundas Street - 1 • Above the Queensway - 1

Interactive Polling Question 3: Based on the information you have now, is the purpose of watershed planning clear?

- Very clear
- Sort of clear
- Not very clear

Figure 1 and **Figure 2** identify whether the purpose of watershed planning was clear to respondents at the September 12 webinar (10 total respondents) and September 13 webinar (six total respondents). Most respondents indicated that the purpose of watershed planning was very clear.

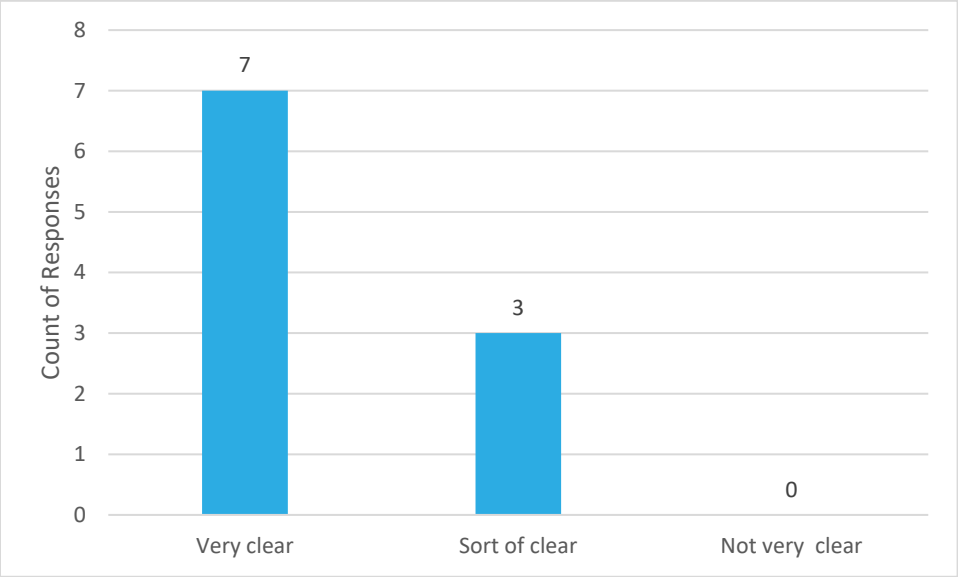

Figure 1: Responses to 'Based on the information you have now, is the purpose of watershed planning clear?' (Sept. 12, 2023 Webinar)

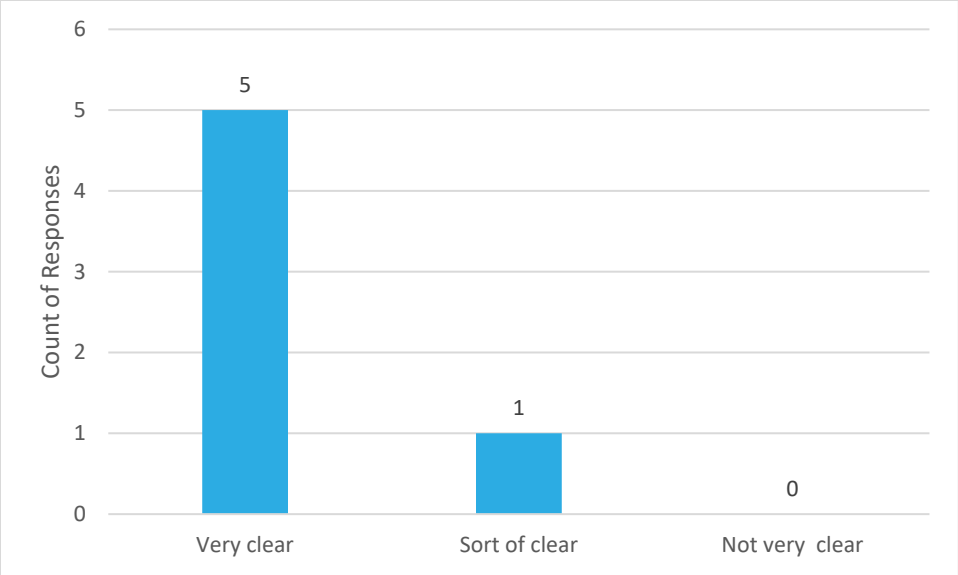

Figure 2: Responses to 'Based on the information you have now, is the purpose of watershed planning clear?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 4: Is the draft Etobicoke Creek Watershed Plan easy to read and understand?

- Easy to read and understand
- Somewhat easy to read and understand
- Not easy to read and understand
- Have not read the draft Etobicoke Creek Watershed Plan

Figure 3 and **Figure 4** identify whether respondents found the draft ECWP easy to read and understand at the September 12 webinar (nine total respondents) and September 13 webinar (six total respondents). On September 12, most respondents indicated that the draft ECWP was somewhat easy to read and understand. On September 13, an equal number of respondents indicated that the plan was somewhat easy to read and understand, or that they had not yet read the plan.

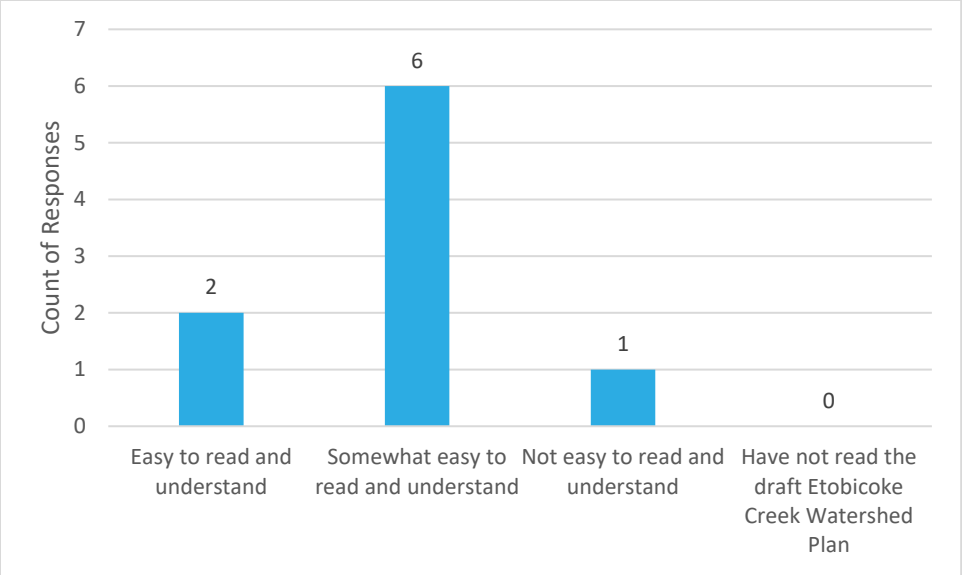

Figure 3: Responses to 'Is the draft Etobicoke Creek Watershed Plan easy to read and understand?' (Sept. 12, 2023 Webinar)

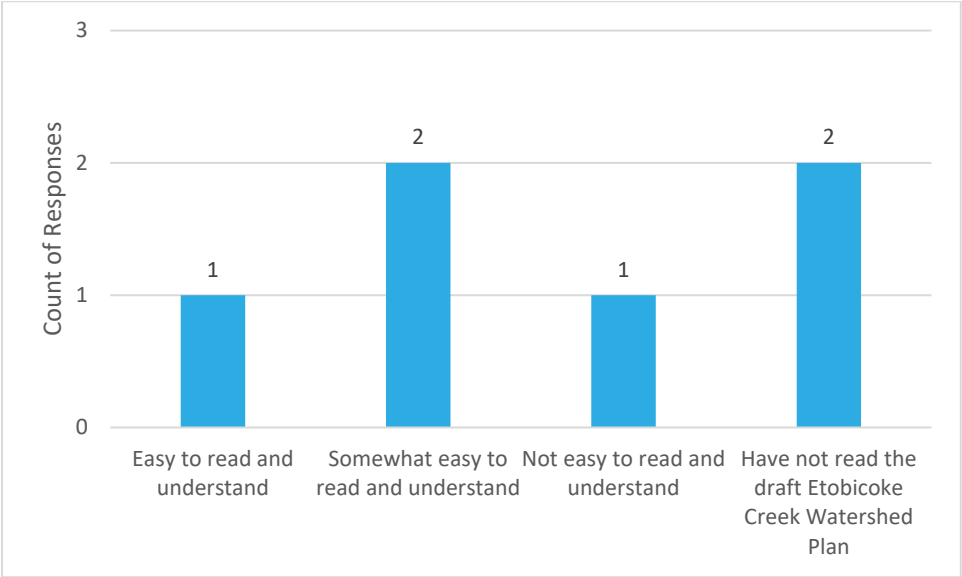

Figure 4: Responses to 'Is the draft Etobicoke Creek Watershed Plan easy to read and understand?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 5: Of the following key issues identified in the Etobicoke Creek watershed, which are the three you are most concerned about?

- Poor aquatic habitat and instream barriers
- Loss and degradation of natural cover and connectivity
- Poor water quality

- Flooding and high surface water runoff
- Erosion risk
- Urbanization and land use change
- Climate change
- Other

Figure 5 and **Figure 6** identify the top three key watershed issues that respondents were most concerned about at the September 12 webinar (nine total respondents) and September 13 webinar (six total respondents). On September 12, the top three issues identified were (i) loss and degradation of natural cover and connectivity, (ii) poor aquatic habitat and instream barriers, and (iii) flooding and high surface runoff. On September 13, the top three issues identified were (i) poor water quality, (ii) loss and degradation of natural cover and connectivity, and (iii) equal amounts of concern regarding flooding and high surface water runoff, poor aquatic habitat and instream barriers, and climate change.

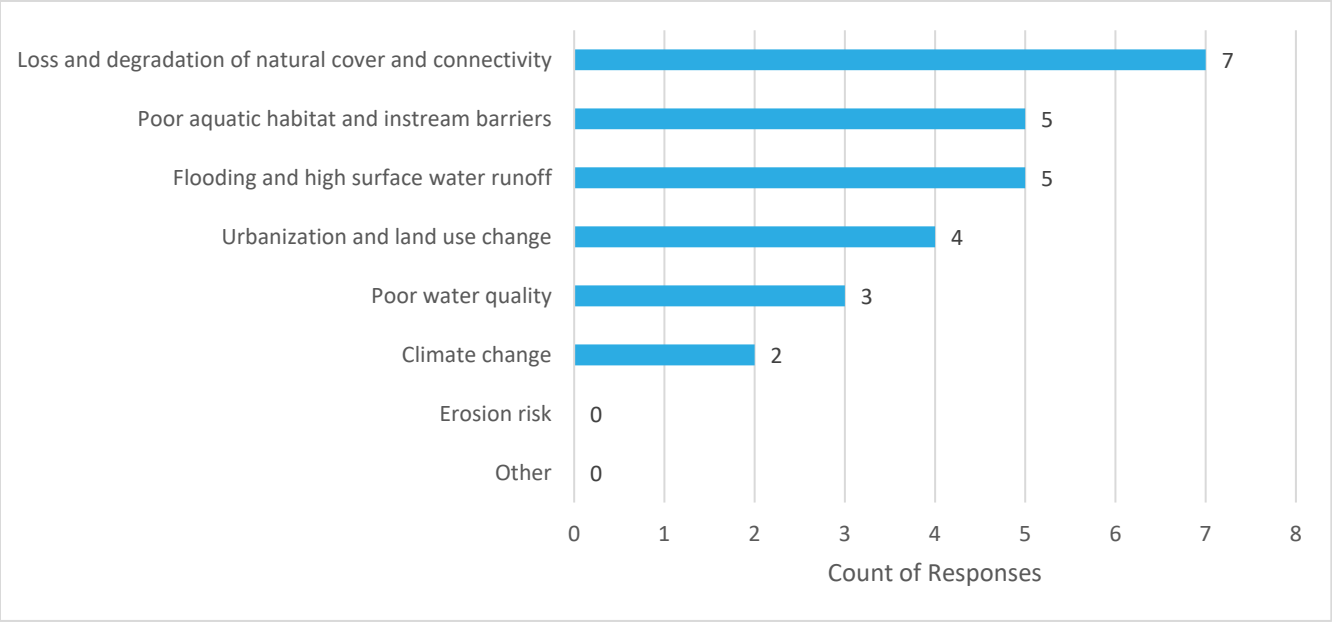

Figure 5: Responses to 'Of the following key issues identified in the Etobicoke Creek watershed, which are the three you are most concerned about?' (Sept. 12, 2023 Webinar)

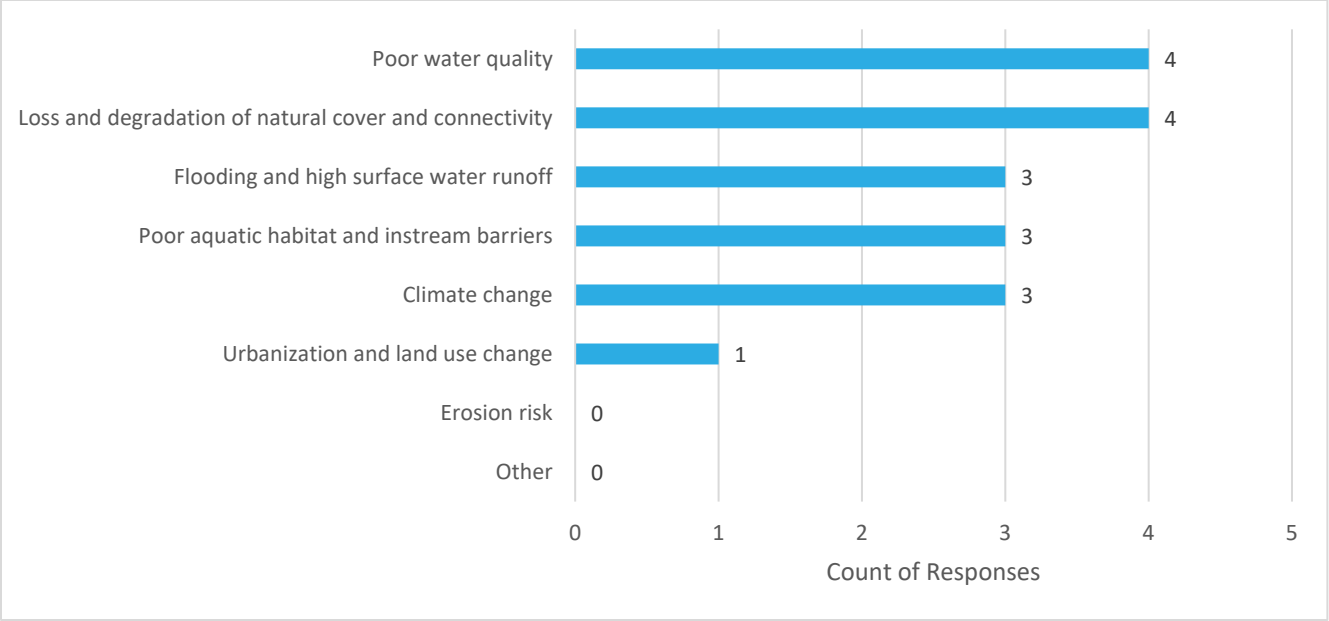

Figure 6: Responses to 'Of the following key issues identified in the Etobicoke Creek watershed, which are the three you are most concerned about?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 6: Which goal in the draft ECWP is the most important to you?

- Goal 1 Land Use
- Goal 2 Water Resource System
- Goal 3 Natural Heritage System and Urban Forest
- All are equally important

Figure 7 and **Figure 8** identify the goals in the draft ECWP that were most important to the respondents at the September 12 webinar (eight total respondents) and September 13 webinar (six total respondents). During both webinars, the majority of respondents indicated that they are all equally important. At the September 12 webinar, the Natural Heritage System/Urban Forest and Land Use goals were also identified as being important to some respondents, and at the September 13 webinar, the Land Use goal was also identified as being important by one respondent.

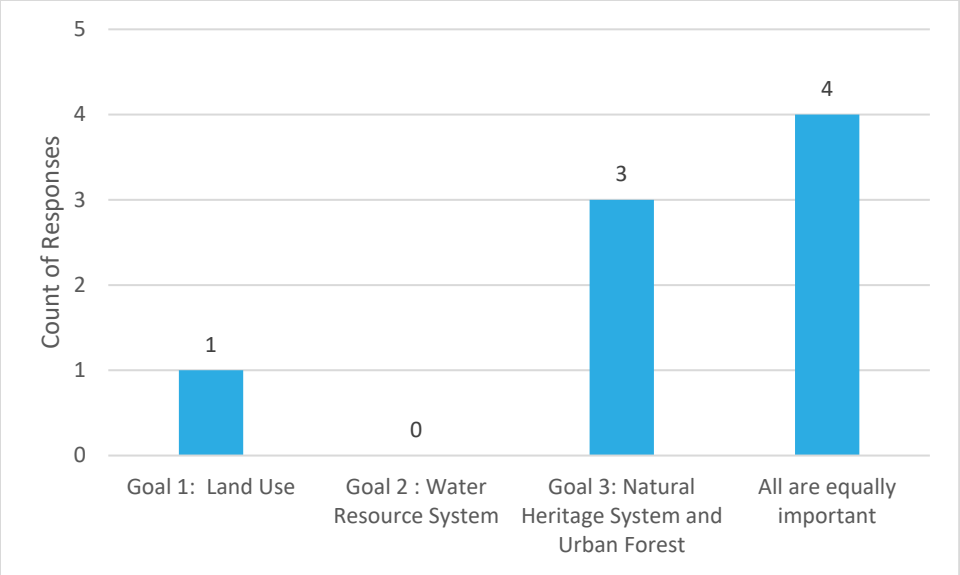

Figure 7: Responses to 'Which goal in the draft ECWP is the most important to you?' (Sept. 12, 2023 Webinar)

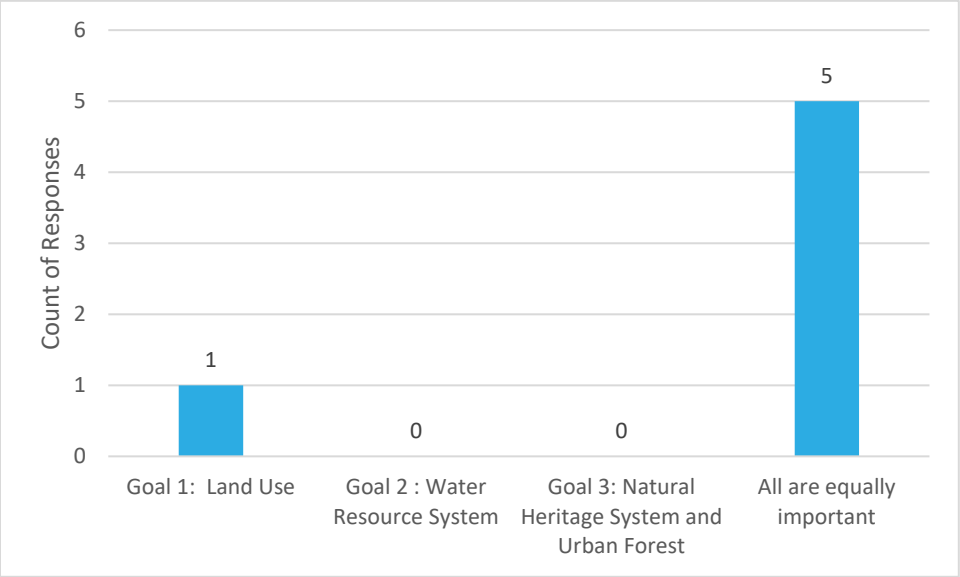

Figure 8: Responses to 'Which goal in the draft ECWP is the most important to you?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 7: The plan identifies a number of priority areas in order to focus implementation efforts. Which of the following priorities are most important to you?

- Priority areas for stormwater management and green infrastructure
- Priority areas for restoration to increase habitat quality and quantity and improve biodiversity and climate resilience
- Priority aquatic barriers for removal to restore in-stream habitat connectivity

- Priority areas for land securement where nature-based solutions can be used as part of flood risk management and to focus conservation efforts
- Priority road crossings to enhance connectivity for wildlife to pass safely
- Priority planting areas to increase tree canopy cover (i.e., urban forest) within the watershed

Figure 9 and **Figure 10** identify the priorities noted as most important to the respondents at the September 12 webinar (eight total respondents) and September 13 webinar (five total respondents). At the September 12 webinar, priority areas for restoration were most important, followed by priority areas for stormwater management and green infrastructure. At the September 13 webinar, priority areas for stormwater management and green infrastructure were most important, followed by priority areas for restoration.

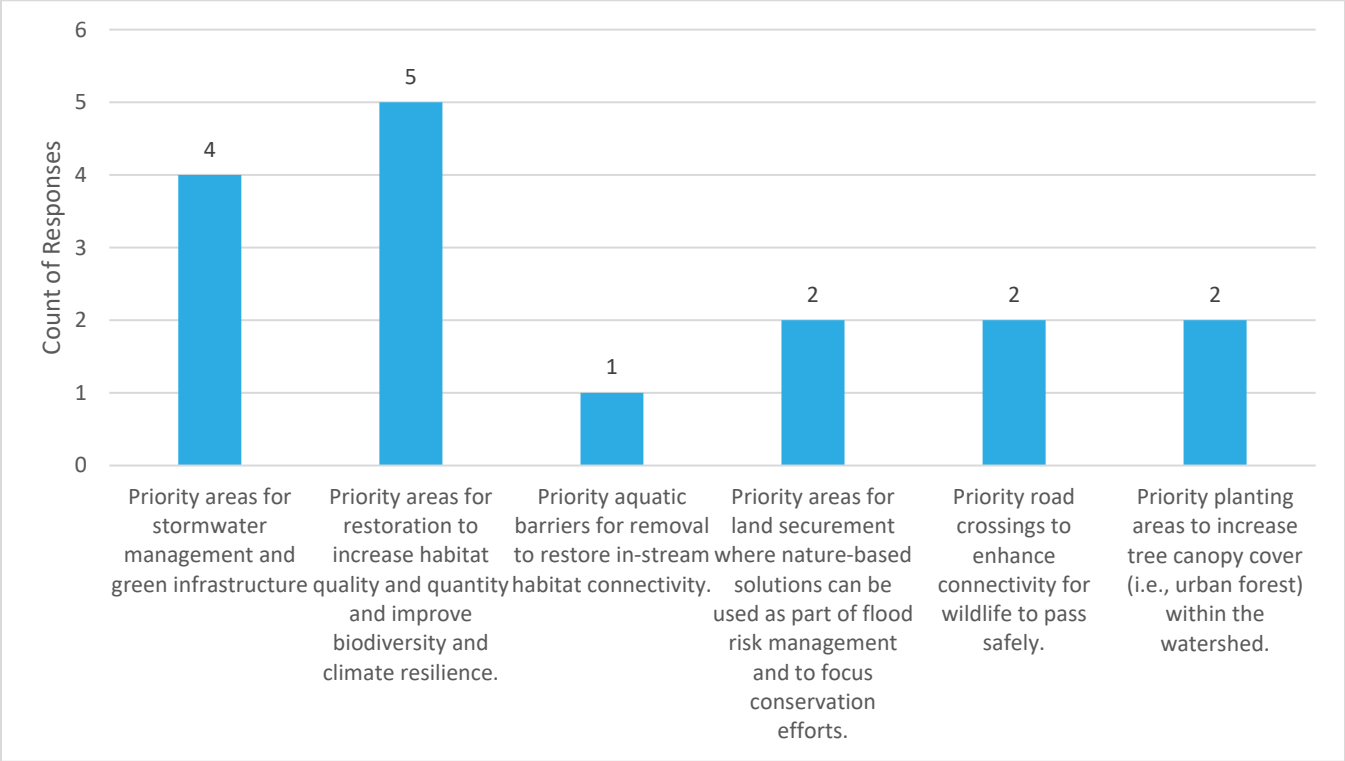

Figure 9: Responses to 'The plan identifies a number of priority areas in order to focus implementation efforts. Which of the following priorities are most important to you?' (Sept. 12, 2023 Webinar)

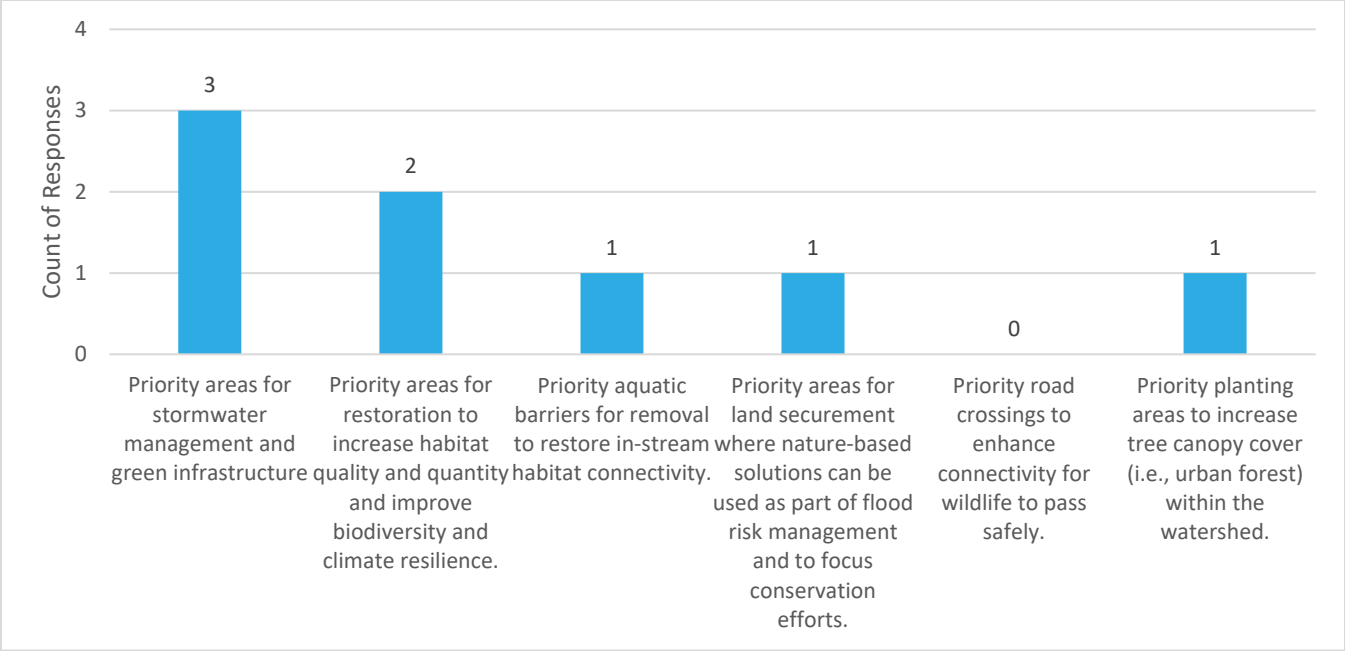

Figure 10: Responses to 'The plan identifies a number of priority areas in order to focus implementation efforts. Which of the following priorities are most important to you?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 8: Municipalities and TRCA should _____ to implement watershed plans?

- Do more than they are currently
- Do about the same as they are currently
- Do less than they are currently

Figure 11 and **Figure 12** identify whether respondents think municipalities and TRCA should do more, the same, or less than they are currently doing to implement watershed plans at the September 12 webinar (eight total respondents) and September 13 webinar (four total respondents). On September 12, 88% of respondents noted that they think that municipalities and TRCA should do more than they are currently doing to implement watershed plans and 12% noted they believe they should do the same as they are currently. On Sept 13, 100% of respondents noted that they think that municipalities and TRCA should do more than they are currently doing to implement watershed plans.

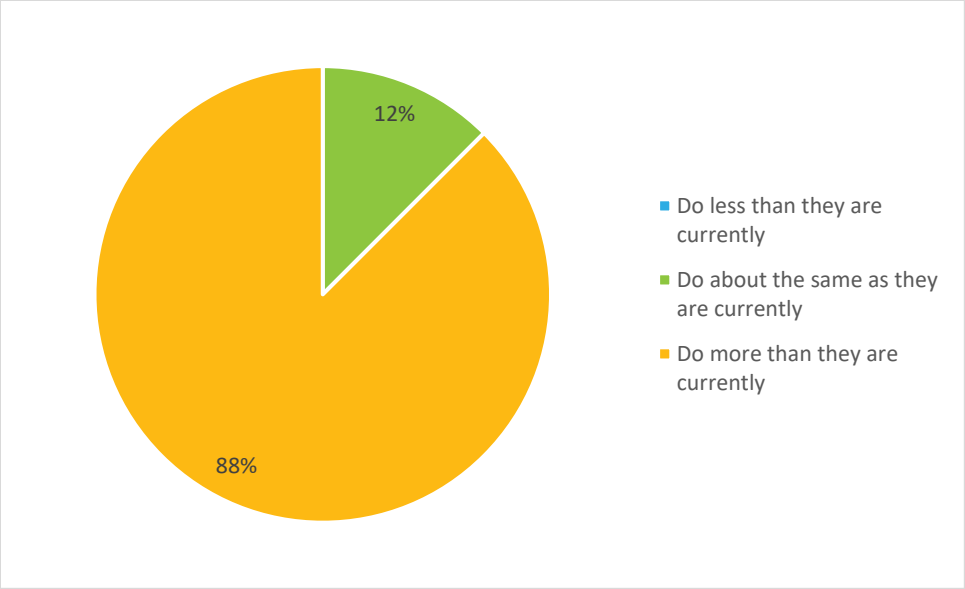

Figure 11: Response to 'Municipalities and TRCA should _____ to implement watershed plans?' (Sept. 12, 2023 Webinar)

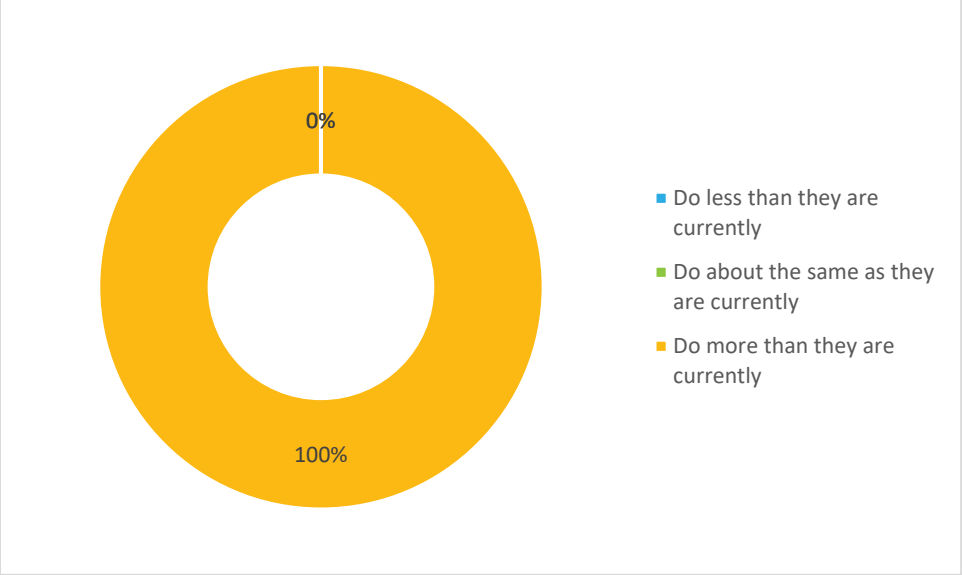

Figure 12: Response to 'Municipalities and TRCA should _____ to implement watershed plans?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 9: Which method listed below would be an effective way to keep you informed of plan implementation, once approved?

- Email subscriber list and stakeholder list
- Social media posts
- Project webpage updates
- Implementation tracking tools

- Establishment of a Stakeholder Advisory Committee for residents and watershed stakeholders (to allow for opportunities to become more involved)
- All should be considered

Figure 13 and **Figure 14** identify the methods respondents believe would be an effective way to keep them informed of plan implementation, once approved, at the September 12 webinar (seven total respondents) and September 13 webinar (five total respondents). The top methods indicated at the September 12 webinar were email subscriber list/stakeholder list and establishment of a Stakeholder Advisory Committee. The top methods indicated at the September 13 webinar were email subscriber list/stakeholder list, establishment of a Stakeholder Advisory Committee, and project webpage updates.

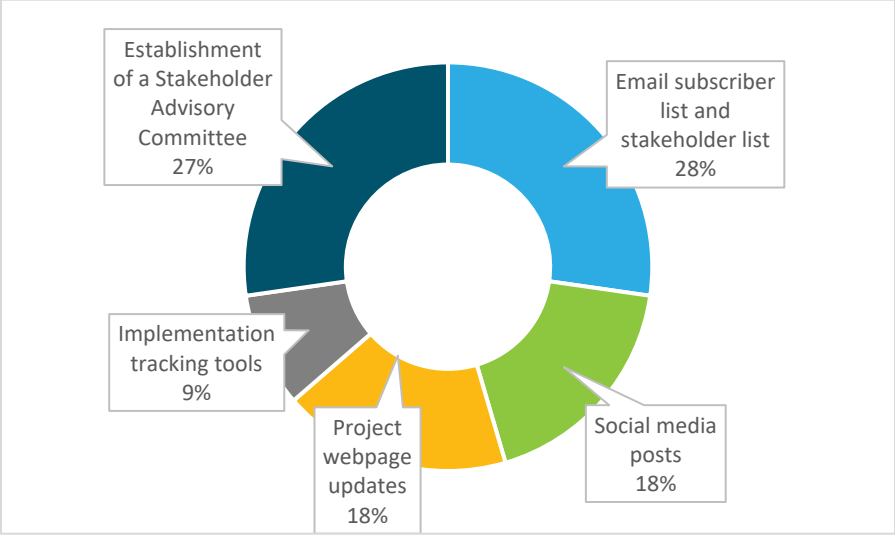

Figure 13: Responses to 'Which method listed below would be an effective way to keep you informed of plan implementation, once approved?' (Sept. 12, 2023 Webinar)

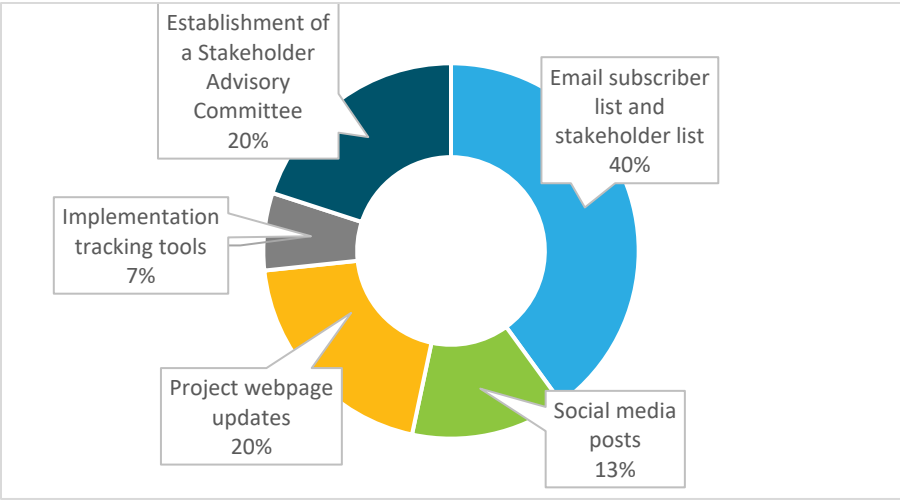

Figure 14: Responses to 'Which method listed below would be an effective way to keep you informed of plan implementation, once approved?' (Sept. 13, 2023 Webinar)

Interactive Polling Question 10: How effective was this webinar in improving your understanding of the draft ECWP?

Figure 15 and **Figure 16** identify how effective the webinars were in improving respondents' understanding of the draft ECWP at the September 12 webinar (seven total respondents) and September 13 webinar (five total respondents). In general, most respondents believed that the webinar was either effective or somewhat effective in improving their understanding of the draft ECWP although there was more variation in the September 12 webinar. Webinar participants were encouraged to email TRCA staff if they had any suggestions on how to make TRCA webinars regarding watershed plans more effective.

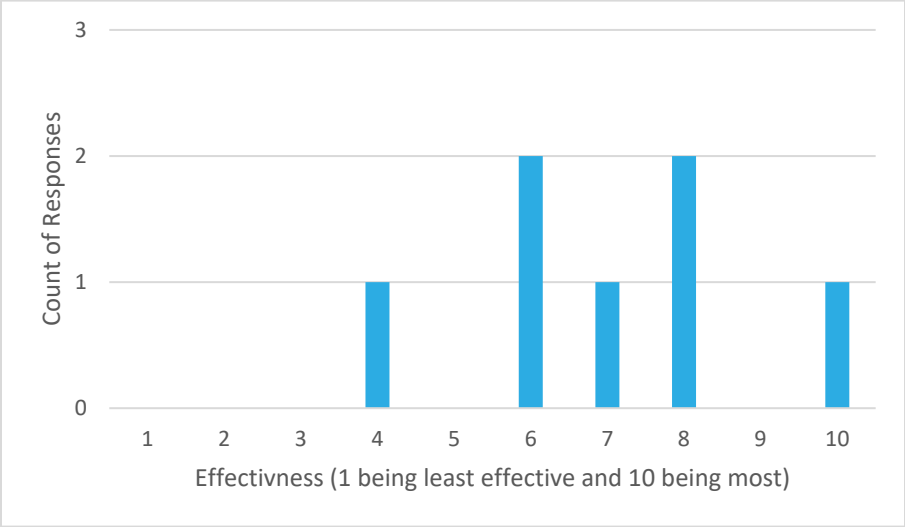

Figure 15: Responses to 'How effective was this webinar in improving your understanding of the draft ECWP?' (Sept. 12, 2023 Webinar)

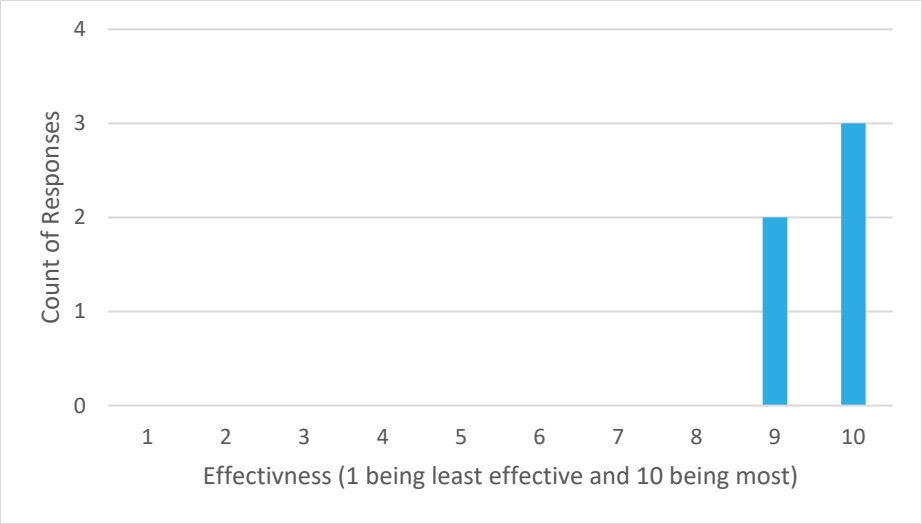

Figure 16: Responses to 'How effective was this webinar in improving your understanding of the draft ECWP?' (Sept. 13, 2023 Webinar)

APPENDIX C: FEEDBACK ON DRAFT ECWP AND RESPONSES

The following table presents all the comments received through the online comment form (16 submissions), hard copy comment form (2 submissions), and direct email (1 submission), notes whether they are general comments or specific to a section of the draft ECWP, provides responses to the comments, and notes whether the comments resulted in updates to the ECWP. Comments are presented in no particular order.

Implementation, Tracking and Reporting of the ECWP

During the public review period for the draft ECWP, some comments noted that the ECWP should include some information about how it will be implemented and how progress on implementation will be tracked. As a result, the following information on implementation, tracking, and reporting of the ECWP has been added as a new section (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**), with a summary included in the **Executive Summary** and **Section 5 Management Framework**.

> Once final approvals and endorsements of the Etobicoke Creek Watershed Plan have been obtained in 2024 from municipal committees and Councils and from TRCA's Board of Directors, implementation of the watershed plan will begin. The Etobicoke Creek Watershed Plan is intended to be in effect for 10 years from when it is finalized and approved. Collaborative and comprehensive implementation, tracking, and reporting of all aspects of the management framework outlined in **Section 5 Management Framework** will be essential to fully realize the vision for the watershed and to improve watershed health and build resiliency to land use and climate changes.
>
> An **Implementation Steering Committee** consisting of TRCA, the municipalities within the watershed, MCFN, and the GTAA will be established in 2024 to guide and support implementation and will be facilitated by TRCA. The Implementation Steering Committee will work together to create a detailed implementation, tracking, and reporting plan to ensure commitment to and accountability for implementation on the part of TRCA, our municipal partners, and other stakeholders. This will include:
>
> - Identifying implementation timelines and clear responsibilities for each management action.
> - Developing specific measures/metrics to track and report on implementation of each management action.
> - Developing tracking and reporting mechanisms specific to the Etobicoke Creek Watershed Plan. This could include an interactive and user-friendly implementation and tracking platform to be developed by TRCA. This tool would track and report on implementation progress using dashboards, story maps, visual tools, etc.
> - Identifying the resources required for implementation, including funding, to support actions such as restoration, in-stream barrier removal, and research/monitoring.
> - Ensuring each Implementation Steering Committee member coordinates with their respective organizations to champion implementation of the Etobicoke Creek Watershed Plan including advocating for effective implementation and exploring opportunities for funding.

TRCA and our partner municipalities (along with a few other stakeholders) will play key roles in the implementation of the management actions. Although the Etobicoke Creek Watershed Plan will not make land use and infrastructure planning decisions, it is intended to inform municipal initiatives and processes. Many of the management actions will be implemented through municipal plans, processes, guidelines, and strategies such as Official Plans, Secondary Plans, zoning by-laws, subwatershed studies, stormwater master planning and stormwater control measures, best management practices, and urban forest and climate change strategies.

The Implementation Steering Committee will also establish mechanisms to continue to receive input from First Nations and Indigenous communities and from watershed stakeholders (including provincial partners, landowners, developers, agricultural organizations, NGOs), residents, and the public. The Implementation Steering Committee will provide updates on implementation progress and ways to participate and engage more directly in various implementation activities.

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General Comments	Your presentation is lengthy and nebulose. If you want people's attention and engagement it must be made shorter.	Thank you for your input on the engagement presentation. In future, we will attempt to shorten presentations, make them less technical and more plain language, and focus on key watershed issues and management actions/priorities to make them more accessible to community members.	No
	I support all aspects of this plan with the caveat that they appear too broad, unmeasurable, and non-specific. How could you possibly track whether you have a 10% increase in tree cover or 16%. How can you know whether there's more storm runoff or the same amount. Be more specific, be more aggressive.	The indicators outlined in **Figure 14 Overview of Management Framework** broadly explain how progress on implementing the objectives (also outlined in **Figure 14**) will be tracked or measured. More specific and measurable metrics for each management action outlined in **Section 5 Management Framework** will be developed by the Implementation Steering Committee and these metrics will be used to track and report on implementation of each management action. The Implementation Steering Committee (to include TRCA, our municipal partners, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority) will be established later in 2024 once final approvals from municipal committees/Councils and TRCA's Board of Directors have been obtained. Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). As part of the implementation of the ECWP, TRCA and its partners will continue to conduct annual reporting on watershed health and plan implementation progress. Annual reporting through TRCA's Watershed and Ecosystems Reporting Hub will help track watershed health trends through inventory/monitoring and using the ECWP indicators. **Section 6.2 Inventory, Monitoring and Evaluation** in the ECWP also provides information about the inventory, monitoring, research, and evaluation that will take place to help assess	Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**.

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
		trends and track implementation of the ECWP. Regular and ongoing inventory/monitoring/research (at monitoring stations in the watershed) will help us determine what is working to maintain or improve conditions and what, if necessary, needs to change should conditions deteriorate. Refinements to the management framework/actions or the number of monitoring stations can be made as necessary based on watershed conditions.	
	It seems like you spent a whole lot of money on consultations with not a whole lot of return.	TRCA used a variety of engagement methods to reach as many watershed residents/stakeholders as possible and was able to obtain valuable feedback/input on the draft ECWP (as detailed in this table) and raise awareness of watershed issues. All the input received was considered and the ECWP was updated accordingly. Engagement activities included direct engagement notifications (via email and through the project webpage), online and hard copy comment form, two virtual webinars (with presentation and interactive sessions), two in-person open houses, social media posts on a variety of platforms, and participation in various community events (where we were able to engage with over 260 participants). In addition, TRCA's online interactive version of the ECWP provides an alternate way for watershed residents, the public, and stakeholders to view the ECWP as well as the maps and various mapping layers.	No
	I didn't see any mention of working with the people who are tasked with management of fish/fish habitat like MNRF, MECP or DFO which is a bit disturbing.	TRCA's Ecosystem and Climate Science staff (in particular the Aquatic Monitoring and Management team) engages and works in partnership with various provincial and federal agencies, including Ministry of Natural Resources and Forestry (MNRF) and Fisheries and Oceans Canada (DFO) regarding fish and fish habitat. TRCA follows provincial data collection methodology and the data collected is provided back to the agencies to enhance their datasets. The data collected contributed to the technical reports that were produced in support of the ECWP, such as the Etobicoke Creek Watershed Characterization Report. TRCA will reach out directly to various provincial and federal agencies to see if and how they would like to be involved in ECWP implementation activities and to keep them updated as implementation of the ECWP progresses.	No
	The document appears like another conservation authority make work document to sell to municipalities who will be asked to fund all of your restoration projects. TRCA would be taken a bit more serious if you focused on core mandates like flooding, flood plains, natural hazards…instead of golf courses, rental properties, and pioneer villages.	Watershed planning, and TRCA's watershed plans, are guided by Ontario's provincial planning framework and municipalities are tasked with implementing watershed plans, often in collaboration with Conservation Authorities because of their technical expertise, data, knowledge of watersheds, and experience in watershed planning. The ECWP will help inform municipal decisions about where and how to grow in a way that minimizes and/or mitigates impacts to watershed health. The ECWP will also be used to inform various other TRCA and municipal initiatives including ecosystem restoration, land management and acquisition, best practices for rural land uses, low impact development and green infrastructure implementation, and climate adaptation.	No

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
		The development of the ECWP was a collaborative effort between TRCA, our municipal partners, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority. Municipal staff representing the municipalities in the watershed were involved throughout the process – in particular, with the development of the management framework and actions. Implementation of the management actions will also be a collaborative effort – with the municipalities implementing many of the actions through municipal plans, processes, guidelines, and strategies such as Official Plans, Secondary Plans, zoning by-laws, subwatershed studies, stormwater master planning and stormwater control measures, best management practices, and urban forest and climate change strategies. The ECWP focuses on four main technical components including water resources, natural heritage/urban forest, water quality, and natural hazards (including flooding and erosion). Although some of the management actions are focused on restoration to increase natural cover and improve ecosystem resilience and sustainability, there are many other management actions identified including some focused on reducing the risks associated with natural hazards through enhanced flood and erosion mitigation (see management actions under Goal 1 and Objective 3 in the ECWP).	
	This is a well-researched and technically well-constructed document outlining a vision for the future of the Etobicoke Creek watershed, including goals, objectives, risks, and actions. There are two things that are less evident in the document. The first is a clear compelling story outlining what will be lost if the recommended actions aren't taken.	Noted. **Section 3 Existing Watershed Conditions** of the ECWP outlines the key issues in the watershed under the four main themes (Water Resource System, Natural Heritage System/Urban Forest, Water Quality, and Natural Hazards) that need to be addressed to ensure watershed health improves and to address the key stressors on the watershed (urbanization, low amounts of natural cover, climate change). A new summary box has been added at the beginning of this section highlighting the key messages from watershed characterization, the main stressors on watershed health, and how climate change will add additional strain on a highly urbanized watershed like Etobicoke Creek. **Table 4 Summary of Watershed Characterization Results** provides an overview of the results of watershed characterization as well as trends over the last 20 years and explains whether the watershed conditions are improving, declining, or experiencing no change. **Section 4 Future Watershed Conditions** provides an overview of scenario analysis which involved assessing and comparing how different potential future land uses, climate changes, and varying levels of watershed enhancements/interventions may affect watershed conditions and overall watershed health. **Table 6 Summary of Future Management Scenario**	Yes – new summary boxes have been added in **Section 3** and **Section 4** with key messages / highlights from characterization and scenario analysis. Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive**

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
		Results provides an overview of the results of scenario analysis – and shows whether watershed conditions for each component improve, stay roughly the same, deteriorate, or significantly deteriorate for each of the four potential scenarios. Essentially, with changing land uses and climate, all four watershed components are negatively impacted, which affects overall watershed health. However, the watershed enhancements to natural cover, urban forest canopy, and stormwater management help mitigate these impacts and contribute to a safer, healthier, and more resilient watershed. A summary of implications is also provided after **Table 6** which provides additional information on how watershed conditions will deteriorate without the appropriate mitigation and adaptation measures and management actions outlined in **Section 5 Management Framework.** The development of the ECWP has been a collaborative effort between TRCA, our municipal partners, Mississaugas of the Credit First Nation, and the Greater Toronto Airports Authority. Support/approval/endorsement of the ECWP from municipalities as well as TRCA's Board of Directors will ensure strong commitment and support for plan implementation.	**Summary** and **Section 5**.
	The second is a clear outline of the level of commitment from municipal, provincial, and other stakeholders that is required that will result in the necessary changes to achieve the vision.	Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). It has been emphasized in **Section 6.1** that the successful implementation of the ECWP (and realization of the vision for the watershed) will require the commitment, collaboration, support, and engagement of TRCA, the municipalities in the watershed, other partners, and watershed stakeholders/residents.	
	A few things I think are missing: 1) While I feel ecology/environment should be at the heart of this plan, promoting some (greater) degree of public access be that for cycling with 3-4M paved path, or a formal hiking trail etc. is legitimate goal within an ecological context because it creates stakeholders and engaged and aware citizens. That doesn't mean an ecologically centered plan needs to fund trails; but it should both mention them and plan for them, even if funded by others.	1) **Management Action 3.1.5** focuses on the expansion of the trail network in the watershed. It notes that municipalities, in collaboration with TRCA and the Greater Toronto Airports Authority are to expand the trail network in the watershed to create a connected and safe active recreational network from Lake Ontario to the Headwaters and to neighbouring watersheds (based on TRCA's Trail Strategy for the Great Toronto Region 2019, the Province-wide Cycling Network, and municipal trail and active transportation strategies) that minimizes potential impacts to the Natural Heritage System. This includes engaging trail users by providing education and outreach on the importance of the Natural Heritage System and promoting community stewardship. Please refer to TRCA's Trail Strategy dashboard for information on the existing and conceptual trails planned in the watershed and along the Lake Ontario shoreline.	Yes – **Management Action 3.1.5** was updated to add reference to TRCA's Trail Strategy, the Province-wide Cycling Network, and municipal trail and active transportation strategies) and to

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	2) There should be a clear commitment to naturalization of the watercourse, in its entirety or as close as possible. (Removing all concrete ditches in favour 45 degree or gentler slopes with native plants/riprap); alternatively, at least, armourstone, with some terracing and some stakes and native seed mix.	2) As part of the development of the ECWP, TRCA developed an enhanced Natural Heritage System (NHS) refined for the Etobicoke Creek watershed (see **Map 6**). This NHS consists of existing natural cover to protect, potential natural cover to restore, and contributing areas (which are areas that may not be suitable for restoration but can provide additional habitat and connectivity benefits through the use of low impact development and green infrastructure). All these components of the NHS will help to increase natural cover and watershed connectivity, and provide ecosystem and habitat benefits throughout the watershed. Various management actions in the ECWP (under the NHS and WRS goals) focus on ensuring that these systems are protected, enhanced, and restored through various TRCA and municipal initiatives/plans. Assuming that the potential natural cover areas are restored, the watershed refined enhanced NHS achieves approximately 23% natural cover across the watershed (up from approximately 12% currently). In addition, priority areas for ecological restoration were identified through a multiple hit analysis of various terrestrial and aquatic criteria overlayed with the NHS – including identification of the top 10 sites for the watershed as well as priority restoration sites by subwatershed (see **Map 3A**, **Map 3B**, and **Appendix B Terrestrial and Aquatic Restoration Priorities** in the ECWP for details). Restoration work at the top 10 watershed sites would result in the restoration of approximately 1,049 hectares of forest, meadow, riparian, wetland, and shoreline habitat. Management actions have been included in the ECWP (2.1.4 and 3.1.3) so that TRCA, in collaboration with our municipal partners, prioritize the restoration of these sites over the next ten years. These sites were selected to provide the most ecological benefits by enhancing habitat quality and quantity, improving habitat/watershed connectivity, enhancing natural cover within riparian corridors, addressing biodiversity needs, and improving watershed resiliency to climate change. The naturalization of the watercourse through removal of failing concrete conveyance systems has been a TRCA priority with our municipal partners including Peel Region in Etobicoke and Mimico Creeks since 2013/2014. The removal of concrete channels is carefully mapped and modelled to determine where channels are failing and need to be remediated. Flood modelling is completed to determine which areas can be restored to a more natural channel design without creating flood risks to adjacent landowners. TRCA will continue this program into the future. TRCA also works in collaboration with our partner municipalities on various restoration/planting programs and initiatives in the watershed (e.g., Alfred Kuehne channel naturalization project in Brampton, and King's Park stream restoration and stormwater treatment project in Mississauga). This includes natural channel projects involving	emphasize the need to engage trail users and collaborate, when possible, to manage problematic invasive species.

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		identification of areas where concrete/hard surfaces can be removed and naturalized (including creation of more gradual slopes, plantings with native species, invasives species management, etc.) without impacts to property and infrastructure. More information about TRCA's restoration projects can be found here. In addition, TRCA's Erosion Risk Management Program monitors and remediates shoreline and valley land erosion hazards throughout TRCA's jurisdiction and encourages proactive prevention, protection, and management of erosion issues on private and public property. This often requires the use of hardened infrastructure and solutions to ensure protection of property and infrastructure. Nature-based solutions and use of softer treatments can only be used in areas where structures/infrastructure will not be at risk.	
	3) Invasive species management needs a clear sense of priority (which species, and which locations in what order). The broad plan doesn't need micro-detail but should have broad strokes.	3) **Management Action 3.1.5** has been updated to include invasive species management. It notes that our municipal partners, TRCA, and the Greater Toronto Airports Authority will collaborate, when possible, to manage problematic invasive species. In addition, restoration projects that will take place as part of the implementation of this plan (by TRCA, our municipal partners or a collaborative effort) could include the removal/management of invasive species, depending on site conditions/presence of invasive species, and funding.	
	4) There needs to be 'signature sites'. At least one in each municipality, ideally at least 2 or 3 in each of Toronto and Brampton.	4) As noted in the response to #2 above, the ECWP identifies priority areas for restoration (top 10 watershed sites and subwatershed sites) based on aquatic and terrestrial criteria and total size (see **Map 3A**, **Map 3B** and **Appendix B Terrestrial and Aquatic Restoration Priorities** in the ECWP for details). These are essentially 'signature restoration sites' that will provide the most ecological benefits in the watershed by enhancing habitat quality and quantity, improving habitat/watershed connectivity, enhancing natural cover within riparian corridors, addressing biodiversity needs, and improving watershed resiliency to climate change. In addition, our municipal partners have their own priorities in terms of municipal park plans, ravine and greening strategies, and restoration projects. For example, the City of Brampton's Eco Park Strategy 2019 identifies a green network for the city consisting of the Brampton Eco Park, city wide and community parks, and greenway boulevards within the Etobicoke Creek watershed. The City of Toronto's Ravine Strategy guides future ravine management, use, enhancement, and protection. The Ravine Strategy identifies the need to develop a valley lands acquisition strategy (as a long-term action) and will help inform specific land acquisition. The City of Mississauga's Parks Plan 2022 is a city-wide parkland provision strategy for City owned and managed parks. The Town of Caledon's Parks Plan 2022 (draft)	

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		will help guide the growth and improvement of the local parks system and identify parks required. TRCA will continue to work collaboratively with our partner municipalities during implementation of the ECWP to investigate opportunities and alignments throughout the watershed for various projects including restoration and channel naturalization, plantings, and the creation of outdoor classrooms and natural style playgrounds, some of which could become 'signature watershed sites'. This collaborative work will help meet the goals and objectives of the ECWP to enhance and restore the natural heritage system in the watershed.	
	5) A sense of what it would take to restore any native fishery and the need for spawning habitat.	5) As noted above, priority restoration sites were identified where restoration will be most beneficial to enhance both terrestrial and aquatic habitat quantity and quality, and improve connectivity, biodiversity, and resilience to climate change. More information on TRCA's restoration prioritization process and some project examples can be found here. Restoration activities could include instream and channel improvements which would improve spawning habitat for target species. In addition, 134 known human-made barriers have been documented in the watershed that prevent the movement of fish species upstream or downstream. TRCA has identified 11 of these in-stream barriers as priority barriers for removal based on an assessment which considers the passability of a structure to migratory and non-migratory fish, and habitat quality of the connectivity (see **Map 5** in the ECWP). The removal of in-stream barriers would improve in-stream connectivity, allow for easier migration and access to higher quality habitats, and help with sediment transport, in stream temperature, and overall water quality.	
	6) I would like to see some key lands alongside the creek, next to West Mall identified for acquisition/restoration: -100-110 The West Mall currently used for truck trailer storage. - A similar site just to the south (abutting the railway corridor off The West Mall. These sites would allow for a bike trail above the creek level, at much lower cost than attempting in-valley works, and ecological restoration of several hectares of land.	6)Your suggestions to identify some key lands adjacent to Etobicoke Creek in the vicinity of The West Mall (north and south of the railway corridor) for acquisition/restoration and for naturalization/restoration of Maurice J. Breen Park north of Lakeshore Road have been shared with City of Toronto staff on the ECWP Steering Committee for their information/consideration. TRCA has completed some riparian restoration work around Etobicoke Creek in the vicinity of 100-110 The West Mall in the past and has identified the length of the valley at this location as potential natural cover (for restoration to help facilitate connectivity) in the ECWP (**Map 6**). The site just south of the railway corridor lies adjacent to existing natural cover patches of	

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	Finally, consideration should be given to naturalizing/restoring the park on the north side of Lakeshore within the City; this would require finding an alternate, nearby site to relocate the playground.	forest and restoration adjacent to these patches would enhance the overall ecological function of this site and improve connectivity. During implementation of the ECWP, TRCA and the City of Toronto can investigate opportunities for additional work in this area on TRCA and City of Toronto owned/managed land (including restoration/plantings and invasive species management), and can also explore opportunities to work with the adjacent private landowners (although any restoration on private land and/or land acquisition would need to be agreed to by private landowners). Maurice J. Breen Park is a city park so the City of Toronto is responsible for any naturalization/restoration work in the park. TRCA has previously identified restoration and naturalization opportunities for the park including riparian and forest plantings (and in the ECWP the area east of Etobicoke Creek has been identified as potential natural cover for restoration– see **Map 6**). Restoring natural cover in this park would improve habitat connectivity and biodiversity. During implementation of the ECWP, TRCA can work with the City of Toronto to further explore opportunities for this park, as appropriate. In terms of trails in the Etobicoke Creek watershed, TRCA is working with our partner municipalities to expand the trail network in the watershed to create a connected and safe active recreational network from Lake Ontario to the Headwaters and to neighbouring watersheds. A conceptual trail has been identified west of the Etobicoke Creek (and west of The West Mall in the vicinity of The Queensway). Please refer to TRCA's Trail Strategy for the Greater Toronto Region for more information.	
	I worry about extreme weather events. I'm glad this is being done. But it feels like the city of Brampton is not on board. I have been told by Bylaw Enforcement that residents can cement their yards provided they leave 6-8 " around the perimeter. So, little to no consequence for creating impermeable surfaces.	The City of Brampton's Zoning By-law has Minimum Landscaped Open Space requirements for residential zones which provides the requirements for the percentage of a front yard that must be landscaped. Zoning by-law enforcement related to the creation of impermeable surfaces and removal of greenery/trees on private land is the responsibility of the municipality. Your concerns about by-law enforcement have been shared with staff at the City of Brampton.	No

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	As a Brampton resident, I feel the City of Brampton, and all cities within the watershed, must do more to enforce the bylaws that protect the watershed from flooding and poor health/poor water quality. The paving/concrete/removal of greenery and trees on private lands is (and will continue) to have a significant detrimental impact on the watershed. Enforcement must be a priority now or it will quickly worsen.	The City of Brampton recognizes that taking small actions at home can reduce the harmful impacts of stormwater runoff and the City's Rain Ready Homes webpage provides information on how residents can make their homes 'rain ready'. The webpage also provides information on the City's Grow Green Recognition Program and explains how you can be acknowledged as a Rain Ready Home. Eligible flood prevention actions include any of the recommended actions in the Flood Guide or on the webpage. Eligible absorption practices include rain gardens, rain barrels, green roofs, permeable pavement, and depaving. Residents are encouraged to share what they are doing to flood-proof their homes and to absorb rainfall by emailing: GrowGreen@brampton.ca In terms of the ECWP, City of Brampton staff (along with our other municipal partners) were involved throughout the development of the watershed plan – in particular with the development of the management framework and actions to help improve watershed health and climate resiliency at the watershed scale. Goal 1 in the management framework focuses on actions that will help mitigate the impacts of current urban development (including increased impervious surfaces) and minimize future impacts from potential urban expansion. This includes ensuring that municipalities adopt green development policies/standards and require new developments/redevelopments to use low impact development/green infrastructure techniques to limit the impacts of impervious cover. Goal 3 in the management framework focuses on increasing natural and urban forest cover (including planting trees on streets and private property, and in parks) within the municipalities in the watershed – and this will also help increase pervious surfaces watershed-wide and improve ecosystem resilience and sustainability.	
	There is nothing about restoral of natural habitat of the Little Etobicoke Creek giving access from Applewood Trail into the Etobicoke Creek walking and biking paths. Scenarios are from 2019 and there were sessions with comments provided at Arms Building in Lakeview some time ago.	Your recommendations for natural habitat restoration of Little Etobicoke Creek in the vicinity of Dixie Road and Dundas Street (and Applewood Trail) have been shared with City of Mississauga staff on the ECWP Steering Committee for their information/consideration. TRCA has completed some forest restoration work adjacent to Little Etobicoke Creek south of Dundas Street in this location previously and has identified some additional riparian, forest, and wetland restoration opportunities for this larger area. The ECWP identifies potential natural cover for restoration in all areas without existing natural cover in the vicinity of Little Etobicoke Creek in the Dixie Road/Dundas Street area (see **Map 6**). Restoration of these areas would improve habitat connectivity and biodiversity in this area. During implementation of the ECWP, TRCA and the City of Mississauga can investigate opportunities for restoration in this area on public land, as appropriate. Any restoration or plantings on private land (e.g., back ends of private lots adjacent to Little Etobicoke Creek valley) would need to be agreed to by private landowners.	No

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		In terms of trails in the Etobicoke Creek watershed, TRCA is working with our partner municipalities to expand the trail network in the watershed to create a connected and safe active recreational network from Lake Ontario to the Headwaters and to neighbouring watersheds. A conceptual trail has been identified to the north and east in this general area to connect to the existing Etobicoke Creek trail. Please refer to TRCA's Trail Strategy for the Greater Toronto Region for more information.	
	The portion close to Kingspoint Plaza in Brampton, which is planned for a significant mixed-use redevelopment and is currently severely impacted by regional flooding events, is not specifically studied, or included as part of the flood mitigations plans in the draft Etobicoke Creek Watershed Plan. We would like to meet with TRCA to discuss and hoping they would include flood mitigation measures are part of the greater studies and fund raising for the proposed upgrades noted in the draft Etobicoke Creek Watershed Plan.	Response provided to this specific inquiry on March 27, 2024. It was suggested that City of Brampton staff be contacted to continue these discussions, and TRCA would be happy to attend any future meetings to discuss flood remediation options and implementation at this site. The Etobicoke Creek Watershed Plan is intended to establish constraints and identify opportunities at a high level. Separate studies are required to develop feasible mitigation plans for areas of interest. Kingspoint Plaza is located within the Regulatory Floodplain of the Etobicoke Creek (and lies within the Brampton Central Flood Vulnerable Cluster). The ECWP includes a number of management actions related to flood and erosion mitigation (Management Actions 1.3.1 to 1.3.5). TRCA will work with our partner municipalities, including the City of Brampton, during implementation of the watershed plan to support the implementation of flood mitigation strategies in flood vulnerable clusters, as appropriate and as recommended in relevant studies/reports.	No
	It continues the TRCA's trend toward excellence in these matters. Very good plan. It offers implementable objectives and addresses climate change.	Noted.	No
	LID is very big in treating stormwater these days. And understandably so. CB Shield is run by three men with close to 100 years of experience treating stormwater. We know we can help with cost saving ideas for long term costs in maintaining water quality. Would love to discuss with you folks.	Noted – and one of the objectives of the ECWP is to minimize the impacts of human land uses through the adoption and implementation of sustainability policies, LID, and green infrastructure. Your interest in LID treatment and helping with cost saving ideas to maintain water quality has been shared with our municipal partners and with other TRCA teams. We encourage you to visit TRCA's Sustainable Technologies Evaluation Program (STEP) webpage to obtain information on this multi-agency initiative developed to support broader implementation of sustainable technologies and practices within a Canadian context. You can also contact STEP directly (STEP@trca.on.ca) for more information and if you are interested in learning about engagement opportunities.	No

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	In the last 15 years there have been three major incidents involving chemicals/oil entering the creek. In most of these cases the spill has continued to Lake Ontario. Will there be a plan moving forward to address this issue? Environments cannot afford to be destroyed every few years due to chemical spills. Please ensure that there is a plan moving forward to address these predictable incidents. In most if not all cases action was not taken immediately therefore resulting in devastating consequences.	The Ontario Ministry of the Environment, Conservation, and Parks (MECP) is the lead agency for responding to spills via its **Spills Action Centre**. However, TRCA, as one of the largest landowners in the Greater Toronto Area (GTA) and as a watershed-based resource manager, is often notified of spill-related matters and engaged as an advisor on spill remediation efforts on TRCA lands. Although TRCA is not a first responder, our planning and technical staff can provide permits for associated restoration or rehabilitation works, advise on the assessment of spill related impacts, and assist with remediation efforts. The ECWP does include a management action that will help to prevent and mitigate spills in the watershed and control industrial/commercial pollution. **Management Action 2.2.2** recommends that TRCA, our municipal partners, the province, and industrial and commercial landowners work together to identify high risk spill areas and implement spill prevention/contingency plans, and to educate commercial/industrial property owners on effective maintenance of oil and grit separators and other pollution control infrastructure.	No
	What else needs to be done after this consultation period? How soon will you start in 2024?	After the 2023 summer/fall public engagement period, TRCA (and the ECWP Steering Committee) considered all input/feedback received on the draft ECWP during the public review period and updated the ECWP accordingly. TRCA will take the ECWP to various municipal committees/Councils for support/endorsement in spring/summer 2024 and to TRCA's Board of Directors for final approval in late summer/early fall 2024. Once final approvals have been obtained, the final watershed plan will be released, and implementation of the watershed plan will begin. This Engagement Summary document (including all comments received on the draft ECWP and responses) will be posted on the project webpage, once completed. Engagement notifications will be circulated to advise of the release of this document (along with the final ECWP, once approved) and the completion of the Implementation Planning stage. The Etobicoke Creek Watershed Plan is intended to be in effect for 10 years from when it is finalized and approved. Implementation (and tracking and reporting of the ECWP) will begin likely in late 2024 with the establishment of an Implementation Steering Committee. Please refer to **Section 6.1 Implementation, Tracking and Reporting of the ECWP** (and to the **Executive Summary** and **Section 5**) for additional information about next steps as well as implementation, tracking, and reporting for the ECWP.	No
	Which scenario will you work on - 1, 2, 3 or 4? It appears from the report that scenario 2 would be the least that should be done. What are the limiting factors to implementing scenarios 3 and 4?	As explained in **Section 4 Future Watershed Conditions** and emphasized in the new summary boxes in **Section 4**, the future management scenarios analyzed are based on different potential future land uses only and do not represent specific municipal planning decisions or result in decisions about the type and configuration of land uses. In other words, the scenarios do not constitute a land use decision, or a particular recommendation on land	No

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		use patterns and specific management actions. The aim was not to select one of these scenarios as the 'preferred scenario or approach' but, instead, the future management scenario analysis helped us understand how watershed conditions may change based on different potential future land uses (and varying amounts of urbanization), climate changes, and different levels of watershed enhancements/interventions. The results of the scenario analysis and watershed characterization were then used to inform the development of the management framework described in **Section 5 Management Framework** and actions needed to protect, enhance, and restore watershed health and ensure a more sustainable and resilient watershed in the future.	
	Honestly it is way too long for people to read, and the information is presented in a way that a strong understanding of English and high education level is required.	Some additional information has been added to the **Executive Summary** (including identifying the four key watershed components considered, and providing information on implementation, tracking, and reporting, and next steps) which provides a succinct overview of the ECWP as well as key messages (in case people would rather read a quick summary rather than the detailed report). New summary boxes were also added to **Section 3 Existing Watershed Conditions** and **Section 4 Future Watershed Conditions** to highlight key messages from the characterization and scenario analysis stages. In addition, an online interactive version of the ECWP is available to provide an alternate way for watershed residents, the public, and stakeholders to view the ECWP as well as the maps and various mapping layers. TRCA used a variety of engagement methods during the summer/fall of 2023 to reach as many watershed residents/stakeholders as possible to obtain input/feedback on the draft ECWP and raise awareness of watershed issues. TRCA hosted webinars/interactive sessions and in-person open houses in September 2023 and attended community events in the summer/fall of 2023 to provide an overview of the ECWP and obtain input in various ways. The ECWP webinar presentation is also available to view on the project webpage.	Yes – new information has been added to the **Executive Summary**, and new summary boxes have been added in **Section 3** and **Section 4** with key messages / highlights from characterization and scenario analysis. Yes – the map viewer in TRCA's online interactive ECWP has been updated to include many of the priority map layers from the ECWP maps.
	The approach and efforts to save our watersheds is really appreciated. But as a B. Arch graduate I think the length and technicality of the document should be easier for the people not in the related fields. It should be clearer and easier in language for the public of each age group, so that everyone can participate in discussions like these. Overall, the concept and methodology as per the knowledge I bear is good. Although I have some specific comments in field of LID zones.		

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	Would like to see what the likely outcome will be plus more information on supportive organizations or information on who is contributing to maintenance/research.	The ECWP is intended to be in effect for 10 years from when it is finalized and approved. Implementation (and tracking and reporting of the ECWP) will be a collaborative effort and will begin likely in late 2024 with the establishment of an Implementation Steering Committee (consisting of TRCA, the municipalities within the watershed, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority). Please refer to **Section 6.1 Implementation, Tracking and Reporting of the ECWP** (and to the **Executive Summary** and **Section 5**) for additional information about next steps as well as implementation, tracking, and reporting for the ECWP (and also see details provided above this table). As part of the implementation of the ECWP, TRCA and its partners will continue to conduct annual reporting on watershed health and plan implementation progress. Annual reporting through TRCA's Watershed and Ecosystems Reporting Hub will help track health trends in the Etobicoke Creek watershed through inventory/monitoring and using the ECWP indicators. **Section 6.2 Inventory, Monitoring and Evaluation** in the ECWP also provides information about the inventory, monitoring, research, and evaluation that will take place to help assess trends and track implementation of the ECWP. Regular and ongoing inventory/monitoring/research (at monitoring stations in the watershed) will help us determine what is working to maintain or improve conditions and what, if necessary, needs to change should conditions deteriorate. Inventory/monitoring will be undertaken by TRCA with supports from partner municipalities. Refinements to the management framework/actions or the number of monitoring stations can be made as necessary based on watershed conditions.	Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**. Minor updates to **Section 6.2** to note that TRCA will undertake inventory / monitoring with support from partner municipalities.
	I feel like you should consider making an info-video and distribute it/advertise it to inform people of information. I also feel that the language used in presentations may also need to be revisited to be accessible to community members.	Thank you for your input on the engagement presentation and your suggestion to create an info-video. In future, we will attempt to shorten presentations, make them less technical and more plain language, and focus on key watershed issues and management actions/priorities to make them more accessible to community members. A short promotional video has been developed and will be released on the project webpage to provide an overview and some highlights from the ECWP. In addition, an online interactive version of the ECWP is available to provide an alternate way for watershed residents, the public, and stakeholders to view the ECWP as well as the maps and various mapping layers.	Yes – the map viewer in TRCA's online interactive ECWP has been updated to include many of the priority map layers from the ECWP maps. An ECWP promotional video will also be

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			released on the project webpage.
	Also, what are developers around the area doing to support initiatives? I.e. Lakeview.	The Building Industry and Land Development (BILD) Association as well as major landowners are included on the project stakeholder contact list and have been kept informed throughout the development of the ECWP. BILD members have also been updated at regular meetings over the last few years and have an opportunity to provide input at these meetings. There is the potential for these stakeholders to participate more actively during implementation of the ECWP.	No
	Thank you for the opportunity to review and comment on the Etobicoke Creek Watershed Plan. We have consulted our experts and clients, and wish to provide the following comments. 1) We believe that a policy scenario for restoring 75% of the woodlands in the upper Etobicoke Creek watershed is unrealistic and difficult to implement. In the context of future urban development, it would be more practical to reduce the restoration scenario percentages and perhaps include boulevard plantings, buffer plantings, and SWM related plantings as part of the offsetting restoration calculation limits.	Noted. 1) Priority areas for ecological restoration were identified through a multiple hit analysis of various terrestrial and aquatic criteria overlayed with the NHS – including identification of the top 10 sites for the watershed as well as priority restoration sites by subwatershed (see **Map 3A**, **Map 3B** and **Appendix B Terrestrial and Aquatic Restoration Priorities** in the ECWP for details). Restoration work at the top 10 watershed sites would result in the restoration of approximately 1,049 hectares of forest, meadow, riparian, wetland, and shoreline habitat. In the Headwaters within the Town of Caledon, TRCA has identified ~130 ha of existing cover that could be enhanced and ~550 ha of potential natural cover that could be restored (including forest, riparian, and wetland habitat). As noted in **Table 12 Top 10 Watershed Priority Restoration Sites**, if there is urban expansion in the Headwaters, most of the restoration opportunities would be through stewardship, and areas of high ecological function should be included in the NHS. Management actions have been included in the ECWP (2.1.4 and 3.1.3) so that TRCA, in collaboration with our municipal partners, prioritize the restoration of these sites over the next ten years (and can work together to seek funding/grants to support this restoration work). These sites were selected to provide the most ecological benefits by enhancing habitat quality and quantity, improving habitat/watershed connectivity, enhancing natural cover within riparian corridors, addressing biodiversity needs, and improving watershed resiliency to climate change. In addition, our municipal partners have their own priorities in terms of municipal park plans, ravine and greening strategies, and restoration projects, and TRCA can continue to collaborate with our municipal partners on these types of restoration projects as well. The ECWP also identifies priority planting areas to increase tree canopy cover (i.e. urban forest) within the watershed including street/park trees and trees on private property (see	Yes – information has been added to the **Executive Summary**, **Section 5**, and **Map 1** to clarify that additional detailed site-level investigations / technical studies will be required to help inform / assess suitability for LID / GI implementation etc. Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**.

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		Map 9). **Appendix B Urban Forest Priorities** provides more information about the urban forest priorities. **Management Actions 3.2.1 to 3.2.3** focus on developing/updating urban forest management plans/strategies as well as strategic tree planting which will help achieve tree canopy cover targets for each subwatershed and municipality (13.3% in Greenbelt portion of Headwaters/11.3% in the Town of Caledon, and 30% for any new developments in areas of Headwaters subwatershed outside of the Greenbelt in Caledon).	
	2) The watershed management plans should add language around confirmation of the applicability of the watershed management plan recommendations based on site-specific data. These watershed plans are based primarily on regional data and mapping, with limited field data, and therefore the recommendations made at a watershed scale, may not be applicable or achievable on a site-specific basis once site data is collected. Some language should be added to the watershed management plan that acknowledges that site-specific data collected should be used to refine the watershed management plan recommendations for individual properties. Or at least some statement to this effect.	2) The management framework in the ECWP is designed to address existing watershed issues and mitigate impacts from potential future land use and climate change at the watershed scale. Additional details have been added to the **Executive Summary** and **Section 5 Management Framework** to note that additional detailed site-level investigations and technical studies will be required (as appropriate and as part of subwatershed planning, environmental assessments, development and planning applications/approvals, etc.,). Further studies will provide local/site level information to help inform and assess the suitability for implementation of some of the management actions (e.g. stormwater controls and the use of low impact development and green infrastructure techniques based on site conditions). Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). TRCA and our municipalities partners (along with a few other stakeholders) will play key roles in the implementation of the management actions. Although the ECWP will not make land use and infrastructure planning decisions, it is intended to inform municipal initiatives and processes and many of the management actions will be implemented through municipal plans, processes, guidelines, and strategies such as Official Plans, Secondary Plans, zoning by-laws, subwatershed studies stormwater master planning and stormwater control measures, best management practices, and urban forest and climate change strategies.	
	3) Some priority areas for LIDs and Green Infrastructure are well understood (i.e., the Brampton esker) but most would need to be evaluated at a site-specific level before confirming their importance or priority for infiltration based SWM measures. In addition, forcing LIDs based on regionally derived data is often not appropriate at a site-specific scale, especially where the soils are not conducive to infiltration or have reduced rates of permeability. Overall, the targets to LIDs and Green Infrastructure are aggressive and should not be	**3) Management Action 1.2.1** has been updated to remove the reference to priority LID areas. The revised management action is as follows: Municipal partners, in collaboration with TRCA, to prioritize on-site control through LID or green infrastructure implementation as much as possible based on site conditions (see **Map 1** for areas in the watershed that would benefit the most from LID or green infrastructure implementation to help with natural/pre-development water balance) or as opportunities arise through municipal capital planning for linear projects (i.e. road improvements) or other initiatives (e.g. sustainable community retrofit projects such as TRCA's Sustainable Neighbourhood Action Program).	

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	specified for any "prioritized areas" but rather averaged over the entire future urban area to be developed – Town wide (typically Region wide). 4) Mapping some areas as ecologically significant groundwater recharge areas (ESGRAs), where again, infiltration based LIDs will be offered as solutions are difficult to pinpoint, implement and maintain on a site specific scale, given that they may be altered through the course of developing the future urban areas. Current water balance policies most often require maintaining groundwater recharge to pre-development rates and adding ESGRAs appears to be a policy overlap for much of the watershed.	The title of **Map 1** in the ECWP has been renamed 'Areas Recommended for LID/GI' (instead of 'Priority Areas for LID/GI'). The information in **Map 1**/**Appendix B** has also been updated to note the following: • **Map 1** shows areas in the watershed that would benefit the most from LID or GI implementation to help regain natural or pre-development water balance. • These areas were identified based on a multi-hit analysis of various criteria (including the results from the erosion and water quality modelling, and other data layers including imperviousness, ESGRAs, sensitive fish species, NHS Contributing Areas, and the Brampton Esker) to determine the highest scoring areas that could benefit from LID or green infrastructure implementation at the watershed-scale. Areas in red are those that would benefit the most from the use of LID or green infrastructure implementation. • This map is meant to be used as a preliminary screening tool. Additional detailed site-level investigations and technical studies will be required to obtain local/site level information to help assess the suitability of the use of LIDs or green infrastructure in these areas based on site conditions. 4) Noted. **Map 2A** in the ECWP shows the location of ESGRAs in the watershed (see Section 2.1 and Section 4.1 Water Resource System in the Watershed Characterization Report for additional information about ESGRAs and their delineation). As noted in the response to #3 above, the areas in the watershed that would benefit the most from LID/GI implementation (as shown in **Map 1** and referenced in **Management Action 1.2.1**) were identified based on a multi-hit analysis of various criteria, including ESGRAs, to help determine the highest scoring areas that could benefit from LID/GI at the watershed scale. This map is meant to be used as a screening tool and additional detailed site-level investigations and technical studies will be required to assess the suitability of LIDs/GI based on site conditions. **Management Action 1.1.1** in the ECWP is focused on municipalities adopting green development policies/standards requiring new developments/redevelopments to use LID/GI techniques to limit the impacts of impervious cover and maintain predevelopment water balance consistent with provincial standards/guidance and outlines the current recommendations to achieve this.	
Executive Summary	You should be consulting the Province as their plans lately have been different than before. I.e., Greenbelt, Growth Plan, PPS changes. Not consulting only confirms that this plan is a make work plan to keep TRCA relevant in today's ever-changing political climate...Bill 23. The	Watershed planning, and TRCA's watershed plans, are guided by Ontario's provincial planning framework and municipalities are tasked with implementing watershed plans, often in collaboration with Conservation Authorities because of their technical expertise, data, knowledge of watersheds, and experience in watershed planning. The ECWP will help inform	Yes - minor changes to Section 1.1.

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	Plan reads as a wish list for the TRCA and their restoration department not a plan to guide municipalities.	municipal decisions about where and how to grow in a way that minimizes and/or mitigates impacts to watershed health. The ECWP will also be used to inform various other TRCA and municipal initiatives including ecosystem restoration, land management and acquisition, best practices for rural land uses, low impact development and green infrastructure implementation, and climate adaptation. The development of the ECWP was a collaborative effort between TRCA, our municipal partners, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority. Municipal staff representing the municipalities in the watershed were involved throughout the process – in particular, with the development of the management framework and actions. Implementation of the management actions will also be a collaborative effort – with the municipalities implementing many of the actions through municipal plans, processes, guidelines, and strategies such as Official Plans, Secondary Plans, zoning by-laws, subwatershed studies, stormwater master planning and stormwater control measures, best management practices, and urban forest and climate change strategies. Although some of the management actions are focused on restoration to increase natural cover and improve ecosystem resilience and sustainability, there are many other management actions focused on sustainable land use and development (including reducing the risks associated with natural hazards through enhanced flood and erosion mitigation) and protecting, enhancing, and restoring the water resources and natural heritage/urban forest in the watershed.	**NOTE:** Additional changes to **Section 1.1** (and throughout the ECWP) will be required if the new Provincial Planning Statement is approved before the ECWP is finalized.
	Suggest putting Watershed Vision on the first page.	The watershed vision was moved to the first page of the Executive Summary as suggested and additional details were added to confirm that the vision reflects collective input and was developed at the beginning of the watershed planning process.	Yes – the **Executive Summary** has been updated to move the watershed vision to the beginning of this section and additional details.
	Assuming the primary audience for this document is senior municipal staff and political and community leaders, the executive summary should emphasize that it is their own staff that contributed to the recommendations and action plan.	Additional information was included in the Executive Summary to confirm that the management framework (and the management actions) in the watershed plan were developed collaboratively by TRCA, the municipalities within the watershed (through municipal staff involvement in the ECWP Steering Committee), Mississaugas of the Credit First Nation, and the Greater Toronto Airports Authority, and is based on the results from the characterization and future management scenarios stages, and on engagement feedback.	Yes – updates have been made to the **Executive Summary** (and **Section 1.3**) with details about the

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			collaborative development of the management framework including municipal staff involvement.
	Refer to a table, in the Background section, of names or at least departments within stakeholders, that contributed so they know who to go to for further information if necessary.	**Section 1.3 Engagement** provides details about the ECWP Steering Committee (made up of representatives from TRCA, the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, MCFN, GTAA, and CVC) who worked collaboratively to develop the ECWP. This section also now notes that the municipal staff members on the Steering Committee were responsible for providing input and guidance throughout the development of the watershed plan on behalf of their respective municipalities (including consolidating comments from various municipal teams). Inquiries about the ECWP can be sent to the project email at etobicoke@trca.ca.	Yes – updates to **Section 1.3** have been made providing additional details about the ECWP Steering Committee and the role of our municipal partners in the development of the ECWP.
	The Watershed Characterization and Future Management Scenario Analysis could be more direct. For instance, "The future scenario analysis results demonstrate that aquatic habitat quality will continue to decrease and will likely become non-supporting of most aquatic life without significant municipal government policy change and investment in urban forest cover, storm water management, low impact development, chloride reduction and management of the ratio of pervious to impervious ground cover.	The Executive Summary includes a high-level summary of the results of both watershed characterization and future management scenario analysis. Additional details are included in **Section 3 Watershed Existing Conditions** and **Section 4 Future Watershed Conditions**. **Section 3** of the ECWP outlines the results of the watershed characterization analysis as well as the key issues in the watershed under the four main themes (Water Resource System, Natural Heritage System/Urban Forest, Water Quality, and Natural Hazards) that need to be addressed to ensure watershed health improves and to address the key stressors on the watershed (urbanization, low amounts of natural cover, climate change). A new summary box has been added at the beginning of this section highlighting the key messages from watershed characterization, the main stressors on watershed health, and how climate change will add additional strain on a highly urbanized watershed like Etobicoke Creek. **Table 4 Summary of Watershed Characterization Results** provides an overview of the results of watershed characterization as well as trends over the last 20 years and explains whether the watershed conditions are improving, declining, or experiencing no change. A new summary box has also been added to **Section 4 Future Watershed Conditions** highlighting the purpose of scenario analysis and the overall message that, with changing	Yes – new summary boxes have been added in **Section 3** and **Section 4** with key messages / highlights from characterization and scenario analysis.

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		land uses and climate, all four watershed components area negatively impacted, which affects watershed health. However, the watershed enhancements to natural cover, urban forest, and stormwater help mitigate these impacts and contribute to a safer, healthier, and more resilient watershed. **Table 6 Summary of Future Management Scenario Results** provides an overview of the results of scenario analysis – and shows whether watershed conditions for each watershed component improve, stay roughly the same, deteriorate, or significantly deteriorate for each of the four potential scenarios. A summary of implications is also provided after **Table 6** which provides additional information on how watershed conditions will deteriorate without the appropriate mitigation and adaptation measures and management actions outlined in **Section 5 Management Framework.**	
	The Implementation Planning section should at least identify that commitments will be required from various stakeholders to achieve the vision. It would be better if these commitments could be summarized in terms of cost, resource, and time implications. Better still would be a graphic illustrating the relationship between watershed investments and projected improvements to watershed health. “This document has been prepared in collaboration with municipal staff and outlines the necessary actions and recommendations that will improvements in the health of the Etobicoke Creek watershed and ensure the sustainability of its eco-system services for future generations."	The development of the ECWP has been a collaborative effort between TRCA, our municipal partners, Mississaugas of the Credit First Nation, and the Greater Toronto Airports Authority. Support/approval/endorsement of the ECWP from municipalities as well as TRCA’s Board of Directors will ensure strong commitment and support for plan implementation. Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). It has been emphasized in **Section 6** that the successful implementation of the ECWP (and realization of the vision for the watershed) will require the commitment, collaboration, support, and engagement of TRCA, the municipalities in the watershed, other partners, and watershed stakeholders/residents. As explained in **Section 4 Future Watershed Conditions** and emphasized in the new summary boxes in **Section 4**, the future management scenarios analyzed are potential future land uses only and do not represent specific municipal planning decisions or result in decisions about the type and configuration of land uses. In other words, the scenarios do not constitute a land use decision, or a particular recommendation on land use patterns and specific management actions. The aim was not to select one of these scenarios as the ‘preferred scenario or approach’ but, instead, the future management scenario analysis helped us understand how watershed conditions may change based on different potential future land uses (and varying amounts of urbanization), climate changes, and different levels of watershed enhancements/interventions. The results of the scenario analysis and watershed characterization were then used to inform the development of the management framework described in **Section 5 Management Framework** and actions needed to protect, enhance, and restore watershed health and ensure a more sustainable and resilient watershed in the future.	Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**. Yes – a new summary box has been added in **Section 4** with key messages / highlights and to emphasize that the future management scenarios are potential future land uses only and scenario analysis is a tool that can be used to compare
	Fine, but it doesn't layout a final plan of action for implementation of the plan and which scenario.		

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			potential scenarios and the potential range of outcomes on watershed conditions.
	Overall, the maps were too small to read any of the data.	Noted. TRCA's online interactive version of the ECWP provides an alternate way to view the ECWP as well as the maps and various mapping layers. The data shown in the ECWP maps will be available on TRCA's Open Data Portal.	Yes – the map viewer in TRCA's online interactive ECWP has been updated to include many of the priority map layers from the ECWP maps.
	Very good Excellent	Noted.	No
Section 1 Introduction and Background	Necessary part of the document to outline the area being discussed and the roles of the various stakeholders. As mentioned, this section could benefit from more detail about the document contributors. How many members of the public were consulted? Which Indigenous groups? Which departments in the municipal governments?	**Section 1.3 Engagement** provides details about the ECWP Steering Committee (made up of representatives from TRCA, the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, MCFN, GTAA, and CVC) who worked collaboratively to develop the ECWP. This section now notes that the municipal staff members on the Steering Committee were responsible for providing input and guidance throughout the development of the watershed plan on behalf of their respective municipalities (including consolidating comments from various municipal teams). **Section 1.3 Engagement** has also been updated to provide a list of the First Nations and Indigenous communities who were engaged throughout the development of the ECWP, as well as more information about public and stakeholder engagement. Additional information about engagement that has taken place throughout the development of the ECWP can be found in the **Engagement Summary** documents available in the Reports and Resources tab of the project webpage. Links to the Engagement Summaries are also provided in the ECWP.	Yes – updates have been made to **Section 1.3** providing additional details about the ECWP Steering Committee, the role of our municipal partners in the development of the ECWP, and engagement throughout plan development.
	The timeline could be done as a graphic instead of a paragraph to make it more readable.	The engagement timeline in **Section 1.3 Engagement** was updated to make it more readable.	Yes – format of timeline was updated in **Section 1.3**.

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	This is a bit repetitive after the Executive summary.	Noted. The Executive Summary is meant to be a stand-alone summary that provides key highlights of the information included in the ECWP. Therefore, there will be some repetition from each of the ECWP Sections.	No
	Very good Acceptable	Noted.	No
Section 2 **Water Resource and Natural Heritage Systems**	Most people don't know enough about the essential ecosystem services provided by local water resource systems and natural heritage systems. While this document is not an educational tool for this purpose, suggest it include reference to books or on-line documents that can provide more background. This is not adequately covered in Section 5.	A new story box has been added to **Section 2 Water Resource and Natural Heritage Systems** providing some information about ecosystem services. TRCA's webpage on ecosystem services and valuation provides additional information on ecosystem services and some of the projects TRCA has been involved in.	Yes – a new story box has been added to **Section 2** with information on ecosystem services.
	Not sure of the purpose of the section, "How was the WRS delineated?" Perhaps this is necessary for technical background but provides little useful information for the casual reader.	The information on WRS delineation was included in **Section 2 Water Resource and Natural Heritage Systems** to provide additional information on the components that make up the WRS (key hydrologic features and areas) since the protection, enhancement, and restoration of the WRS is one of the three goals of the ECWP. The WRS in the watershed is currently stressed (with limited natural cover, poor water quality, and poor aquatic habitat conditions). Implementing the management actions in **Table 9 WRS Management Actions** will be essential to enhancing the health of the watershed and adapting to climate change.	No
	Good explanation of the two systems. Very good	Noted.	No
Section 3 **Existing Watershed Conditions**	**Section 3.1 Context and Background** - no comment.	Noted.	No
	Section 3.2 Historical and Current Land Uses - interesting statistics, particularly as it indicates that development along the watershed in recent years is focused more on conversion of rural to urban whereas previously it the conversion was more from natural to urban spaces. Also the growth in impervious cover would be more interesting if there was context and comparison data to other more sustainable/healthier watersheds.	**Table 3 Land Use Change** has been updated to include the hectares of urban, rural, natural, and impervious cover to help show that between 2002 and 2012 urban cover and impervious cover have increased, while rural and natural cover have decreased (with the loss of rural cover even more so than natural cover between 2012 and 2019). The Watershed Characterization Report (Section 1.3) provides additional details about the land use change between 2002 and 2019, and the Future Management Scenario Analysis Report (Table 3) shows the land use change by future management scenario. Please refer to TRCA's Watershed and Ecosystems Reporting Hub where you can explore impervious cover area by watershed and municipality within TRCA's jurisdiction.	No
	Section 3.3 Current State of the Watershed - it would be useful to have or reference a map showing % of natural cover, stormwater runoff intensity, and natural hazard areas in addition to the Flood	TRCA's online interactive version of the ECWP provides an alternate way to view the ECWP. You can explore some of the key mapping layers shown in the ECWP including the flood vulnerable clusters, monitoring stations, land use cover for the four future management	Yes – the map viewer in TRCA's online interactive ECWP has been

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	Vulnerable Clusters.	scenarios, as well as various mapping layers from the ECWP maps. The data shown in the ECWP maps will be available on TRCA's Open Data Portal. Please refer to both the Watershed Characterization Report and the Future Management Scenario Analysis Report for additional maps that were prepared during the watershed characterization and future management scenario analysis stages (including mapping of natural cover, habitat connectivity, canopy cover, erosion hazard monitoring sites, erosion sensitivity, drainage areas to Flood Vulnerable Clusters).	updated to include many of the priority map layers from the ECWP maps.
	Table 4 would benefit from a comparison to other watersheds that are in better condition in addition to the trend lines. This table is a key piece of information. A bit more interpretation would help the casual reader get more out of it. Overall, the trends look disturbing but it's not clear what conclusion the reader should draw from this data. This section should spell it out. How bad is it?	Please refer to TRCA's Watershed and Ecosystems Reporting Hub where you can explore regional watershed conditions and trends for the watersheds (including the Etobicoke Creek watershed) within TRCA's jurisdiction. This link has also been added to the ECWP (in **Section 3.3** and **Section 6.1).** **Table 4 Summary of Watershed Characterization Results** provides an overview of the results of watershed characterization as well as trends over the last 20 years for a number of components under each of the four main themes (Water Resource System, Natural Heritage System/Urban Forest, Water Quality, and Natural Hazards) and explains (under the Trend Assessment column) whether the watershed conditions are improving, declining, or experiencing no change between the baseline (2002-2010) and current (2011-2020) periods. This is explained in the text just before **Table 4**. The four key issues in the watershed based on the watershed characterization results are outlined prior to **Table 4** – and a new summary box has been added at the beginning of this section highlighting the key messages from watershed characterization, the main stressors on watershed health, and how climate change will add additional strain on a highly urbanized watershed like Etobicoke Creek. TRCA's online interactive version of the ECWP provides an alternate way to view the ECWP and the Existing Conditions tab outlines the key issues and whether conditions are improving, not changing, or declining.	Yes – a new summary box has been added to **Section 3** with key messages / highlights from watershed characterization. Links to TRCA's Watershed and Ecosystems Reporting Hub have been added to **Sections 3.3** and **6.1**.
	Ok, but the Ontario Headwaters Institute continues to suggest that current condition reports should include data on lengths of a watercourse that are underground (EG Taylor Massey Creek), or hardened - in concrete channels, or armourstone or gabion basket containment features. These could be candidate sites for restoration, which should also drain or diminished wetlands, as well as areas where new wetlands can be created by backwater spillways.	Noted - and TRCA can work with our municipal partners to incorporate this information into future watershed characterization reports/watershed plans as data on historical/buried watercourses becomes available. For the ECWP, a new story box has been added to **Section 3 Existing Watershed Conditions** providing some information about historical watercourses, in particular the loss of natural watercourses in the City of Toronto and within the Etobicoke Creek watershed. A map showing the location of historical watercourses in the watershed (in Toronto) has been	Yes – a new story box on historical watercourses has been added in **Section 3**.

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		included. As noted in this new section, the ECWP does not assess the hydrologic or ecological impacts of burying these historical watercourses or provide advice on potential restoration opportunities. However, TRCA and the City of Toronto are exploring the feasibility of potential restoration opportunities for certain historical watercourses (including within the southern portion of the Etobicoke Creek watershed). This collaborative work will examine areas within the alignment of historical watercourses where hydrologic functions could be improved and natural cover could be increased. As well, TRCA and the City of Toronto are investigating potential ways to better highlight the natural, cultural, and historical significance of historical watercourses, including through signage and improved mapping.	
	A good summary of the existing conditions in the watershed. In **Table 4**, water quality evaluation was difficult to understand. For example, when a sample "met CWQG" or "PWQO", was that good or bad?	Under the Water Quality component, **Table 4 Summary of Watershed Characterization Results** lists all of the parameters that were analyzed as part of watershed characterization as well as the Canadian Water Quality Guidelines (CWQG) or Provincial Water Quality Objectives (PWQO) for each parameter (e.g., for total suspended solids the federal water quality guidelines are 30 mg/L). In healthy ecosystems, 100% of samples would meet the guidelines or objectives. **Table 4** notes what percentage of the samples meet the guidelines (always less than 100% which means conditions need to improve so that 100% of samples meet the CWQG or PWQO for each parameter). The trend assessment shows whether the percentage of samples meeting the CWQG or PWQO between the baseline and current periods are increasing or decreasing.	Yes – clarification information has been added to footnotes 4 and 6 in **Table 4** (**Section 3**) for water quality parameters.
	Need improvement	Noted. A new summary box has been added at the beginning of this section to provide a bit more clarification on the results of watershed characterization. It highlights the key messages from watershed characterization, the main stressors on watershed health, and how climate change will add additional strain on a highly urbanized watershed like Etobicoke Creek	Yes – a new summary box has been added in **Section 3** with key messages / highlights from watershed characterization.
Section 4 **Future Watershed Conditions**	**Table 6** provides an excellent comparison of the impact of the four scenarios on watershed health. More information is required, however, to identify the fiscal and resource impact of achieving each of the scenarios. It would also be helpful if the report provided a recommendation regarding which scenario the community should strive for. In the absence of any other information, clearly scenario 4 would be the appropriate approach.	As explained in **Section 4 Future Watershed Conditions** and emphasized in the new summary boxes in **Section 4**, the future management scenarios analyzed are based on different potential future land uses only and do not represent specific municipal planning decisions or result in decisions about the type and configuration of land uses. In other words, the scenarios do not constitute a land use decision, or a particular recommendation on land use patterns and specific management actions. The aim was not to select one of these scenarios as the 'preferred scenario or approach' but, instead, the future management scenario analysis helped us understand how watershed conditions may change based on different potential future land uses (and varying amounts of urbanization), climate changes, and different levels of watershed enhancements/interventions.	Yes – a new summary box has been added in **Section 4** with key messages / highlights from scenario analysis. Yes – new implementation, tracking, and

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
		The results of the scenario analysis and watershed characterization were then used to inform the development of the management framework described in **Section 5 Management Framework** and actions needed to protect, enhance, and restore watershed health. Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). **Section 6.1** emphasizes that the successful implementation of the ECWP (and realization of the vision for the watershed) will require the commitment, collaboration, support, and engagement of TRCA, the municipalities in the watershed, other partners, and watershed stakeholders/residents.	reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**.
	The four scenarios are fine, but which one will be chosen?		
	There might be greater mention of the negative impact of increased water temperatures on aquatic life, with associated increased monitoring.	Please refer to the Future Management Scenario Analysis Report (Sections 2.1.3 Fish Community Health, 2.1.4 Benthic Community Health, 2.1.5 Aquatic Habitat Health, 2.1.7 Thermal Classification, and 2.1.8 Climate Change and Aquatic Systems) for additional information on the impacts of increased water temperatures on aquatic life and the assessment for each of the four future management scenarios. TRCA undertakes monitoring for aquatic health every three years (based on resources and funding) and includes monitoring of the fish community, aquatic health, and the benthic invertebrate community. Instream temperature is monitored throughout the open water season every three years and is used to develop thermal classification guidelines as well as inform assessments of the impact of changing climate on the fish community.	No
	The zoning laws should be amended to avoid creating buildings related to activities which creates any kind of pollution even like smoke, grease, oils, or dust. To my understanding even though these pollutants can be filtered or treated, it may have impacts on the environment due to human discrepancies.	Any amendments to zoning by-laws related to building development are the responsibility of the municipalities. However, the ECWP does include a management action that will help to prevent and mitigate spills in the watershed and control industrial/commercial pollution. **Management Action 2.2.2** recommends that TRCA, our municipal partners, the province, and industrial and commercial landowners work together to identify high risk spill areas and implement spill prevention/contingency plans, and to educate commercial/industrial property owners on effective maintenance of oil and grit separators and other pollution control infrastructure. In addition, the ECWP includes several management actions focused on municipal policies and programs for the long-term protection, enhancement, and restoration of the water and natural heritage resources in the watershed. This includes updating Official Plans and zoning bylaws to ensure these areas/features are identified and protected, avoiding development near these key areas/features through the establishment of appropriate buffers, and implementing mitigation measures where avoidance of these areas/features is not possible. This will help to maintain the function of these important natural features.	No

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
	The draft of watershed plan should not even allow the Low Impact Developments around the creek. I have seen in my native land, how people have destroyed their Natural heritage systems creating buildings around them and polluting the creeks and canal.	One of the key goals of the ECWP is to achieve sustainable land use and development to improve watershed conditions and enhance climate resiliency. This includes minimizing the impacts of human land uses through implementation/adoption of sustainability policies, low impact development, and green infrastructure. Low impact development and green infrastructure refers to practices that reduce stormwater runoff and mimic a site's predevelopment hydrology by minimizing impervious (hard) cover and then infiltrating, filtering, storing, evaporating, and detaining stormwater runoff close to its source (it does not refer to allowing development in the vicinity of the Etobicoke Creek). The ECWP encourages municipalities to use low impact development and green infrastructure techniques (e.g., rain gardens, green roofs, rain harvesting, permeable pavement, bioswales) to limit the impact of hard cover and maintain predevelopment water balance consistent with or exceeding provincial standards/guidelines. An enhanced Natural Heritage System for the Etobicoke Creek watershed was also developed for the watershed plan (see **Map 6**). This includes existing natural cover to be protected, potential natural cover to be restored, and contributing areas. Contributing areas are areas that may not be suitable for restoration and could be targeted for low impact development/green infrastructure implementation. The watershed-refined enhanced Natural Heritage System will help manage stormwater runoff, improve the quantity and quality of the natural heritage and water resource systems, and provide additional habitat and connectivity.	No
	Good	Noted	No
Section 5 Management Framework	This section is the most important part of the document yet is missing critical content. The goals do not follow S.M.A.R.T. principles. They lack specificity, there is no indication about the risks to their achievability, there is no tie-in to the four scenarios outlined in the previous section, there is no financial or resource implications included, (other than what's identified in tables, 15, 17), and they are not time-based. Using wording such as "collaboration with municipal partners" and "shall strive to meet" indicates that the goals are aspirational, with no specific framework, beyond general actions, for how they will be achieved. What is the level of municipal partner buy-in to the policy changes and financial commitments that will be required to meet the future state outlined in scenario 3 or 4? What resource commitment will be required, for instance, to improve education and outreach to the agricultural community as identified in	As explained in **Section 4 Future Watershed Conditions** and emphasized in the new summary boxes in **Section 4**, the future management scenarios analyzed are based on different potential future land uses only and do not represent specific municipal planning decisions or result in decisions about the type and configuration of land uses. In other words, the scenarios do not constitute a land use decision, or a particular recommendation on land use patterns and specific management actions. The aim was not to select one of these scenarios as the 'preferred scenario or approach' but, instead, the future management scenario analysis helped us understand how watershed conditions may change based on different potential future land uses (and varying amounts of urbanization), climate changes, and different levels of watershed enhancements / interventions. The results of the scenario analysis and watershed characterization were then used to inform the development of the management framework described in **Section 5 Management Framework** and achievable actions needed to protect, enhance, and restore watershed health and ensure a more sustainable and resilient watershed in the future.	Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**.

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
	1.4.2? These are the types of questions that need to be addressed in order to instill confidence that this plan can be implemented.	The development of the ECWP (and the management framework) was a collaborative effort between TRCA, our municipal partners, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority. Support/approval/endorsement of the ECWP from municipalities as well as TRCA's Board of Directors will ensure strong commitment and support for plan implementation. Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). **Section 6.1** emphasizes that the successful implementation of the ECWP (and realization of the vision for the watershed) will require the commitment, collaboration, support, and engagement of TRCA, the municipalities in the watershed, other partners, and watershed stakeholders/residents.	
	In **Management Action 1.1.1** - Does the reference to green development standards need to be updated as the Province has come out against them? There are also similar new proposals to shift some water takings and stormwater management issues to a voluntary Environmental Permissions process. https://ero.ontario.ca/notice/019-6928.	One of the key objectives of the ECWP is to minimize the impacts of human land uses through the adoption/implementation of sustainability policies, low impact development, and green infrastructure. **Management Action 1.1.1** is still appropriate as it focuses on the need for the municipalities in the watershed, in collaboration with TRCA, to adopt green development policies/standards requiring new developments or redevelopments to use LID/green infrastructure techniques that are consistent with or exceed provincial standards or guidelines. The recommendations provided are based on the draft provincial guidance (still to be finalized).	No
	I am from Missouri on LID and the headwater drainage feature initiative. It would be good to see footnotes referencing reports on performance in those regards.	The Etobicoke Creek Watershed Characterization Report and Future Management Scenario Analysis Report contain information on the headwater drainage features assessment completed for the ECWP (refer to Section 2.1 and References section in both reports, and Section 4.1 in the Characterization Report for additional details). In addition, **Section 2 Water Resource and Natural Heritage Systems** in the ECWP provides an overview of the headwater drainage features assessment completed for the ECWP. **Appendix B (LID Implementation Case Study)** in the ECWP provides a case study of the cost/benefits of particular LIDs to help demonstrate how watershed enhancements using LIDs can help address issues related to flooding, water quality, and erosion in developed portions of the watershed. The following sites provide additional information and references for both headwater drainage features and LIDs: – TRCA's LID webpage – Sustainable Technologies Evaluation Program (STEP's) webpage	No

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		– Low Impact Development Stormwater Management Planning and Design Guide (STEP) – TRCA's Stormwater Management Criteria – TRCA's Headwater Drainage Features webpage – Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC and TRCA) – TRCA's Watershed and Ecosystems Reporting Hub (for interactive information on environmental conditions of the Toronto Region including data on the Water Resource System)	
	The goals and objectives don't seem to connect with the four scenarios for action. Goal 3, in 5.3, the urban forest is declining in the last three years from the QEW to Lake Ontario due to the hundreds of trees and shrubs that have been cut down/removed. There has been a noticeable decline in bird and animal populations as a result of this tree removal. Things are going backwards here! Also, City of Toronto is not replacing trees that die in this area.	The development of the four potential future management scenarios was informed by the results of characterization (i.e., existing conditions) as well as the potential future stressors on watershed health including urbanization, low amounts of natural cover, and climate change. Further urbanization in the Headwaters and climate change were factored into the future management scenario analysis as much as possible to determine how these key stressors will potentially impact watershed health for the four key watershed components (Water Resource System, Natural Heritage System/Urban Forest, Water Quality, and Natural Hazards). So, scenario analysis was essentially used as a tool to compare how possible future land uses, and climate change (with different levels of enhancements to natural cover and stormwater management) may affect watershed health. The management framework (including the goals, objectives, and management actions) outlined in **Section 5 Management Framework** of the ECWP was developed in collaboration with our municipal partners, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority to address the issues identified during the watershed characterization stage and to mitigate potential future stressors (i.e., urbanization and climate change) as identified during the future management scenario analysis. The management actions aim to minimize and mitigate the impacts of urban development while protecting, enhancing, and restoring ecosystems to improve watershed health. **Management Actions 3.2.1 to 3.2.3** focus on increasing tree canopy cover (i.e. the urban forest) throughout the watershed (target for City of Toronto in the ECWP is 24% canopy cover). This, along with other actions aimed at improving the quality and quantity of the natural features will have significant benefits for overall watershed health, biodiversity, habitat connectivity, ecosystem resilience, and climate adaptation/resiliency. The City of Toronto is investing in tree planting and stewardship on private land to help enhance and expand the City's urban forest (e.g., through the City's urban forestry grants and incentives program). City of Toronto Urban Forestry also has programs for street tree planting, mandatory street tree replacement, and Tree Protection Bylaws that require	No

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
		replacement tree planning or cash in lieu. The City of Toronto canopy cover (i.e., trees and shrubs) target (for the entire city) is 40%. The City is moving towards a Tree Equity approach to focus efforts related to expanding the urban tree canopy (including incorporating social equity factors and measures of tree canopy into canopy cover analyses), although this does not preclude other opportunities to expand the tree canopy.	
	Right Good	Noted	No
Section 6 Monitoring and Evaluation **(updated to Implementation, Monitoring and Evaluation)**	Reporting frequency and extent looks to be adequate to determine changes in watershed health. The Adaptive Management Cycle identified in Fig. 17 is fine to highlight changes to the plan based on variances to the plan based on the technical feedback of field measurements. What's missing is reporting on plan metrics and milestones and what management actions will be taken if/when the plan drifts off-track.	Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). **Section 6.1** emphasizes that the successful implementation of the ECWP (and realization of the vision for the watershed) will require the commitment, collaboration, support, and engagement of TRCA, the municipalities in the watershed, other partners, and watershed stakeholders/residents. As part of the implementation of the ECWP, TRCA and its partners will continue to conduct annual reporting on watershed health and plan implementation progress. Annual reporting through TRCA's Watershed and Ecosystems Reporting Hub will help track health trends in the Etobicoke Creek watershed through inventory/monitoring and using the ECWP indicators. **Section 6.2 Inventory, Monitoring and Evaluation** in the ECWP also provides information about the inventory, monitoring, research, and evaluation that will take place to help assess trends and track implementation of the ECWP. Regular and ongoing inventory/monitoring/research (at monitoring stations in the watershed) will help us determine what is working to maintain or improve conditions and what, if necessary, needs to change should conditions deteriorate. Inventory/monitoring will be undertaken by TRCA with supports from partner municipalities. Refinements to the management framework/actions or the number of monitoring stations can be made as necessary based on watershed conditions.	Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**.
	Strong statements are lacking with regards to what actions will be taken if areas being monitored are not improving. What is the time given for improvement? What level of improvement is required in order for the action plan to be considered successful? There are not enough firm measurement metrics to gage progress. Process for ongoing discussions and follow up with various project partners like municipalities and provincial government departments.		
	Good	Noted	No
Section 7 Maps	Static maps are inadequate to see the level of detail necessary at the neighbourhood level. By definition, the document will be static but there should be links to online maps that could be reviewed at a greater level of detail.	TRCA's online interactive version of the ECWP provides an alternate way for watershed residents, the public, and stakeholders to view the ECWP as well as the maps and various mapping layers. The data shown in the ECWP maps will be available on TRCA's Open Data Portal.	Yes – the map viewer in TRCA's online interactive ECWP has been updated to include many of
	They are too small to read the information, so not very useful.		

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
			the priority map layers from the ECWP maps.
	Not sure what the difference is between the top watershed restoration sites and the top sub-watershed restoration sites. Why the differentiation?	TRCA identified priority areas for ecological restoration including identification of the top 10 sites for the watershed as well as priority restoration sites by subwatershed (see **Map 3A**, **Map 3B,** and **Appendix B Terrestrial and Aquatic Restoration Priorities** in the ECWP for details). These are the sites where restoration will be most beneficial to enhance habitat quantity and quality, and improve connectivity and biodiversity, and are also based on total size. Sites were identified at the watershed scale and the subwatershed scale to ensure there was a range of sites covering all municipalities in the watershed. There is intentional overlap between the top 10 watershed and subwatershed sites, since the top 10 watershed sites are the largest sites by the amount of restoration opportunity, which would also be the top sites for the relevant subwatershed.	No
	Priority restoration sites outlined in Table 12 should show targeted timelines for implementation as well as risks and dependencies.	Information about implementation, tracking, and reporting for the ECWP has been included in a new section in the ECWP (**Section 6.1 Implementation, Tracking and Reporting of the ECWP**) with a summary added to the **Executive Summary** and **Section 5** (see details provided above this table). Restoration work will require funding and municipal/TRCA resources and the Implementation Steering Committee will explore a variety funding/grant opportunities. Any risks and dependencies will be discussed during implementation of the watershed plan.	Yes – new implementation, tracking, and reporting section has been added to the ECWP (**Section 6.1**), with a summary in the **Executive Summary** and **Section 5**.
	Good	Noted.	No
Appendix A	Good educational document and helps provide justification for defined actions related to pervious/impervious ratios.	Noted.	No
	The various outflows into the creek have been mapped. Action needs to be taken with the various companies that are dumping into these pipes which is leading to decreased water quality. It is not unusual to see signs of pollution flowing into the creek from these outflows.	Noted. The ECWP does include a management action that will help to prevent and mitigate spills in the watershed and control industrial/commercial pollution. **Management Action 2.2.2** recommends that TRCA, our municipal partners, the province, and industrial and commercial landowners work together to identify high risk spill areas and implement spill prevention/contingency plans, and to educate commercial/industrial property owners on effective maintenance of oil and grit separators and other pollution control infrastructure.	No
	Good	Noted.	No
Appendix B	Useful educational document about the cost benefit analysis of LID. Not sure how this relates to the management actions identified in 1.1.1, 1.1.5, 1.2.1, 1.2.2, other than to provide general justification.	**Map 1** in the ECWP shows the areas in the watershed that would benefit the most from LID or green infrastructure implementation to help regain natural or pre-development water balance (related to **Management Action 1.2.1**). **Appendix B** includes a case study of the cost	Yes – updates have been made to **Map 1** to note

Draft ECWP Section	Draft ECWP Engagement Comment	Response	Updates Made to ECWP
		and benefits of particular LIDs to demonstrate how watershed enhancements including the use of LIDs can address issues related to flooding, water quality, and erosion in developed portions of the watershed. This case study highlights the cost/benefits of LID implementation (and return to pre-development water balance) at one location in the watershed and is an example of what could be possible in terms of LID implementation in the watershed.	that this map shows the areas in the watershed that would benefit the most from LID/green infrastructure implementation (rather than priority areas).
	Restoration of the 10 top watershed sites will cost about $50MM. Where will this money come from? Canopy cover enhancements $23MM. Same question.	An Implementation Steering Committee consisting of TRCA, the municipalities within the watershed, Mississaugas of the Credit First Nation, and Greater Toronto Airports Authority will be established later in 2024 to guide and support implementation and will be facilitated by TRCA. TRCA and our partners will seek grants/funding during the implementation stage to help support ECWP implementation. Restoration work will require funding and municipal/TRCA resources, and the Implementation Steering Committee will work together to explore a variety funding/grant opportunities. The restoration and urban tree planting costs have been removed from **Appendix B** since these costs are contingent on current market prices of stock and market conditions so may change significantly from year to year.	Yes – restoration and urban tree planting costs have been removed from the ECWP.
	Good	Noted.	No

APPENDIX D: SUMMARY OF KEY CHANGES TO THE ECWP

Edits were made to the draft ECWP to incorporate feedback received during the public review period, where appropriate. The following table identifies the section of the ECWP that was changed and outlines the key revisions. The draft ECWP and the updated ECWP (version to be taken to municipal committees/Councils for endorsement/support) can be viewed on the project webpage. The final/approved ECWP will be posted once available. The online interactive ECWP provides an alternate way to view the ECWP and includes a map viewer so readers can explore maps and mapping layers from the ECWP.

ECWP Section	Key Revisions to the ECWP
Executive Summary	• The watershed vision box was moved to the first page of the Executive Summary and the bolded text was added prior to vision statement. WATERSHED VISION: Etobicoke Creek watershed is protected and restored to a cleaner, healthier, and more natural state, to sustain its waterways, ecosystems, and human communities. **Reflecting the collective input, a vision for the watershed was developed at the beginning of the watershed planning process which guided the development of the Etobicoke Creek Watershed Plan.**
	• The bolded text was added in a new box to outline the four main watershed components important to watershed health that were assessed for the ECWP. **The Etobicoke Creek Watershed Plan focused on assessing four main components that are important for watershed health and identifies priorities for improving them:** **1. Water Resource System (i.e. aquatic habitat, in-stream barriers, and groundwater conditions)** **2. Natural Heritage System and Urban Forest (i.e. terrestrial habitat quantity, quality, and connectivity, tree canopy cover, and sensitive species)** **3. Water Quality (i.e. surface water quality)** **4. Natural Hazards (i.e. flooding and erosion)**
	• Minor revisions were made to the description of the watershed characterization and future management scenario analysis stages (to summarize where possible).
	• The Implementation Planning description section was revised to include additional information about the development of the management framework, the need for additional detailed site-level investigations and technical studies (since the ECWP focuses on the watershed (not site-specific) scale), and the inventory, monitoring, and evaluation program.
	• The bolded text was added with information on next steps and implementation, tracking, and reporting of the ECWP. **Once final approvals and endorsements of the Etobicoke Creek Watershed Plan have been obtained in 2024 from municipal committees and Councils and from TRCA's Board of Directors, implementation of the watershed plan will begin. The Etobicoke Creek Watershed Plan is intended to be in effect for 10 years from when it is finalized and approved. Collaborative and comprehensive implementation, tracking, and reporting of all aspects of the management framework will be essential to fully realize the vision for the watershed and to improve watershed health and ensure sustainability of its ecosystem services for current and future generations.** **An Implementation Steering Committee consisting of TRCA, the municipalities within the watershed, Mississaugas of the Credit First Nation, and the Greater Toronto Airports Authority will be established in 2024 to guide and support implementation and will be facilitated by TRCA. The Implementation Steering Committee will work together to create a detailed implementation, tracking, and reporting plan to ensure commitment to and accountability for implementation on the part of TRCA, our municipal partners, and other stakeholders.**

ECWP Section	Key Revisions to the ECWP
	• The bolded text was added in a new box with the link to the online interactive ECWP. **Explore the online interactive Etobicoke Creek Watershed Plan and a map viewer with useful mapping layers here.**
Section 1 Introduction and Background	• The introductory section was reorganized and updated to provide some additional information including the following new bolded text to explain the process used to develop the ECWP and to emphasize the importance of collaborative implementation. **The development of the Etobicoke Creek Watershed Plan was a multi-stage process that consisted of:** • **Watershed Characterization (2020-2021) – to determine current watershed conditions for four key components including the Water Resource System, Natural Heritage System and Urban Forest, Water Quality, and Natural Hazards (i.e. flooding and erosion).** • **Future Management Scenario Analysis (2021-2022) – to assess potential future management scenarios to understand how watershed conditions may change including examining the impacts of different potential future land uses, varying levels of watershed enhancements (e.g. stormwater management improvements and increased natural and urban forest cover), and the implications of climate change (where possible).** • **Implementation Planning (2022-2024) – to develop a realistic management framework with priority actions to protect, enhance, and restore watershed health and to ensure the long-term sustainability and resiliency of the watershed.** This watershed plan has a ten-year time frame. **To fully realize the vision for the watershed plan, collaborative and comprehensive implementation by TRCA, the municipalities in the watershed, and other stakeholders of all aspects of the management framework (outlined in Section 5. Management Framework) is essential.** Through regular **inventory,** monitoring, and evaluation, including adaptive management, the watershed plan will be updated, or refined, as needed on an ongoing basis.
Section 1.1 Rationale and Policy Basis	• The Rationale and Policy Basis text was revised slightly to provide additional information on the importance of watershed planning and healthy watersheds, and to reflect Provincial policy/planning changes.
Section 1.3 Engagement	• The title of this section was changed from ‘Partners and Stakeholders’ to ‘Engagement’.
	• The bolded text was added with information on the role of municipal staff on the ECWP Steering Committee, and to provide additional information on the First Nations and Indigenous communities as well as the watershed stakeholders that were engaged throughout the development of the ECWP. The development of this watershed plan commenced in early 2020 through the establishment of a Steering Committee consisting of representatives from TRCA, the City of Toronto, Region of Peel, City of Mississauga, City of Brampton, Town of Caledon, MCFN, and **the** GTAA. **The municipal staff members on the Steering Committee were responsible for providing input and guidance throughout the development of the watershed plan on behalf of their respective municipalities (including consolidating comments from various municipal teams).** Credit Valley Conservation was also involved in the Steering Committee to ensure consistency in watershed planning approaches between neighbouring watersheds. Throughout **the watershed planning** process, **extensive engagement took place** to increase awareness of watershed planning and to solicit feedback on components of the watershed plan. **The following First Nations and Indigenous communities were engaged:** • **Mississaugas of the Credit First Nation (member of the Steering Committee as the Treaty holding First Nation within the watershed)** • **Williams Treaties First Nations (including Beausoleil First Nation, Chippewas of Rama First Nation, Chippewas of Georgina Island First Nation, Curve Lake First Nation, Mississaugas of Scugog Island First Nation, Hiawatha First Nation, and Alderville First Nation)** • **Huron-Wendat Nation**

ECWP Section	Key Revisions to the ECWP
	• **Six Nations of the Grand River** • **Métis Nation of Ontario** **Engagement also took place with various stakeholders (including Building Industry and Land Development Association and other developers in the watershed, community/resident groups, golf courses, major private landowners, non-governmental organizations, etc.), watershed residents and the general public, project webpage subscribers, municipal Councillors with ward boundaries within the watershed, Regional Watershed Alliance members, and TRCA Board members. Further engagement opportunities were leveraged through various TRCA teams such as Education and Training, Sustainable Neighborhood Action Program (SNAP), Professional Access Into Employment (PAIE), Newcomer Youth Green Economy Project (NYGEP), Multicultural Connections Program (MCP), and Partners in Project Green (PPG).**
	• The engagement timeline was updated to be more reader friendly.
	• The information on the Engagement Summary documents was added to a box and a link to the reports on the project webpage was provided.
Section 2 Water Resource and Natural Heritage Systems	• A new story box was added to provide some information about ecosystem services.
Section 3 Existing Watershed Conditions	• The introductory section was updated to include additional details about the purpose of watershed characterization and the focus on the four key watershed components, and to provide additional context/clarification.
	• The bolded text was added in a new box to outline the key messages from watershed characterization. **Watershed Characterization Key Messages (i.e. Existing Conditions)** **The Etobicoke Creek watershed is a highly urbanized watershed with a significant amount of impervious cover (i.e. hard surfaces) and low amounts of natural and rural land cover. This has resulted in a high amount of stormwater runoff, issues with flooding and erosion, and impacts to aquatic and terrestrial habitat quantity and quality and to water quality. Climate change including increased precipitation, annual average temperatures, and the intensity and frequency of extreme weather events will add additional strain on a watershed like Etobicoke Creek and will further impact watershed health.** **Based on the technical analyses completed as part of watershed characterization, the key issues affecting the Etobicoke Creek watershed that will need to be addressed to improve watershed health include:** • **Water Resource System: Aquatic habitat conditions are poor, and the watershed has a high amount of runoff and in-stream barriers that affect aquatic ecosystem health.** • **Natural Heritage System and Urban Forest: there is a low amount of natural cover and habitat quality is generally 'poor'. The remaining natural cover is highly vulnerable to the effects of climate change.** • **Water Quality: Surface water quality is generally poor compared to other TRCA watersheds.** • **Natural Hazards: The watershed has six Flood Vulnerable Clusters (which means there are flood risks in these areas), and can be categorized as medium or high erosion sensitivity.**

ECWP Section	Key Revisions to the ECWP
Section 3.1 Context and Background	• A new story box was added to provide some information about biodiversity in the Etobicoke Creek watershed including some of the sensitive species present in the watershed.
Section 3.2 Historical and Current Land Uses	• **Table 3 Land Use Change** was updated to include the hectares for each land cover type and for impervious cover.
Section 3.3. Current State of the Watershed	• The bolded text was added in a new box with information on TRCA's Watershed and Ecosystems Reporting Hub. **TRCA's Watershed and Ecosystems Reporting Hub is another resource that provides interactive regional information about the watersheds (including the Etobicoke Creek watershed) and the waterfront in the Toronto region. The Reporting Hub identifies current conditions by theme and explains the importance of different environmental indicators for understanding watershed and ecosystem health. It also shows how conditions are changing over time and where we are relative to where we want to be which means we can determine if watershed conditions are declining and what actions may be required to improve watershed health.**
	• A new photo was added to the page outlining the differences between urban forest and natural cover and a link was provided to learn more about these differences.
	• Footnotes 4 and 6 in **Table 4 Summary of Watershed Characterization Results** related to the Canadian Water Quality Guidelines and Provincial Water Quality Objectives were updated (see bolded text) to provide additional context on water quality conditions. Footnote 4: Canadian Water Quality Guidelines are federal water quality guidelines for various parameters. **In healthy ecosystems, 100% of samples meet guidelines.** Footnote 6: Provincial Water Quality Objectives refer to provincial water quality standards for various parameters. **In healthy ecosystems, 100% of samples meet objectives.**
	• A new story box was added to provide some information about historical watercourses in the Etobicoke Creek watershed with a focus on historical watercourses in the City of Toronto.
Section 4 Future Watershed Conditions	• The bolded text was added in a new box to outline the key messages from future management scenario analysis and to provide additional context/clarification. **Future Management Scenarios Analysis Key Messages (i.e. Future Conditions)** **Future management scenario analysis is a technical exercise that involves assessing and comparing how different potential future land uses, climate changes, and varying levels of watershed enhancements/interventions may affect watershed conditions and overall watershed health. Scenario analysis is essentially a tool that can be used to compare the potential scenarios and does not constitute a land use decision, or a particular recommendation on land use patterns and specific management interventions. All of the scenario analysis information, along with the results of watershed characterization, were used to inform the development of the management framework described in Section 5. A management framework and associated actions are needed to protect, enhance, and restore watershed health and ensure a more sustainable and resilient watershed.** **For the Etobicoke Creek watershed, four different potential future management scenarios (described in Table 5) were assessed to help understand how each of the key watershed components (i.e. Water Resource System, Natural Heritage System and Urban Forest, Water Quality, and Natural Hazards) may respond in the future (i.e. will conditions improve, stay the same, or deteriorate). TRCA conducted extensive watershed modelling and performed technical analyses to assess the impacts of different levels of land uses, climate change (where possible), and watershed enhancements (e.g. improvements to natural cover, urban forest canopy, and stormwater management) on watershed health.** **The scenario analysis results highlighted that, with changing land uses and climate, all four watershed components are negatively impacted, which affects overall watershed health. However, the watershed enhancements help mitigate these impacts and contribute to a safer, healthier, and more resilient watershed**

ECWP Section	Key Revisions to the ECWP
Section 4.2 Future Scenarios	• The bolded text was added in a new box to emphasize that the future potential management scenarios are based on potential future land uses to show the range of what may be possible in the future based on various future land use, climate change, and levels of enhancements. They do not represent specific municipal planning decisions. **It is important to note that the future management scenarios analyzed are based on different potential future land uses only and do not represent specific municipal planning decisions or result in decisions about the type and configuration of land uses. In other words, the scenarios do not constitute a land use decision, or a particular recommendation on land use patterns and specific management actions. The aim was not to select one of these scenarios as the 'preferred scenario or approach' but, instead, the future management scenario analysis helped us understand how watershed conditions may change based on different potential future land uses (and varying amounts of urbanization), climate changes, and different levels of watershed enhancements/interventions.**
Section 5 Management Framework	• The text in the introductory section was reorganized, and additional information was added about the need for additional detailed site-level investigations and technical studies (since the ECWP focuses on the watershed (not site-specific) scale), and on next steps and implementation, tracking, and reporting of the ECWP (see bolded text). **Additional detailed site-level investigations and technical studies will be required (as appropriate and as part of subwatershed planning, environmental assessments, development and planning applications/approvals, etc.). Further studies will provide local/site level information to help inform and assess the suitability for implementation of some of the management actions (e.g. stormwater controls and the use of low impact development and green infrastructure techniques based on site conditions).** **To fully realize the vision for the Etobicoke Creek watershed and to improve watershed health and ensure sustainability of its ecosystem services for current and future generations, collaborative and comprehensive implementation of all aspects of this management framework is essential. Implementation of the management framework (and the specific management actions) will begin once final approvals and endorsements of the Etobicoke Creek Watershed Plan have been obtained from municipal committees and Councils and from TRCA's Board of Directors in 2024. Section 6 – Implementation, Monitoring and Evaluation provides additional details about implementation of the Etobicoke Creek Watershed Plan including establishment of an Implementation Steering Committee and development of a detailed implementation, tracking, and reporting plan to ensure TRCA and the municipalities in the watershed, in particular, are committed to and held accountable for implementation.**
	• In **Figure 14** (**Overview of Management Framework**) the Indicator for Goal 1, Objective 1 was revised. **Original Indicator**: Complete LID or green infrastructure projects in each of the identified priority areas (Map 1). **Revised Indicator (in bold):** Complete LID or green infrastructure projects **in the recommended areas that would benefit most from LID or green infrastructure implementation** (Map 1).
	• In **Figure 14** (**Overview of Management Framework**) the Erosion Indicator for Goal 1, Objective 3 was revised. **Original Indicator:** Work towards remediating the 11 infrastructure hazard sites identified on Map 2. **Revised Erosion Indicator**: **Continue monitoring and remediating infrastructure hazard sites for participating municipal partners, implementing the assessment and maintenance of erosion control asset systems.**
Section 5.1 Land Use Goal	• The information on the proposed Highway 413 was revised slightly (see bolded text). The decision of whether to proceed with the construction **of Highway 413** rests with the **P**rovince. **Some municipalities have expressed differing positions about the proposed Highway 413 with calls for the Province to consider alternatives.** This watershed plan includes a management action (1.1.3) intended to mitigate watershed impacts of this Highway, as much as possible, which is directed at the Ministry of Transportation should construction **of Highway 413** proceed.
	• Management Action 1.1.1 was revised.

ECWP Section	Key Revisions to the ECWP
	Original text: Municipal partners, in collaboration with TRCA, to adopt green development policies, or standards, requiring new developments and redevelopments, to utilize low impact development and green infrastructure techniques to limit the impacts of impervious cover and maintain predevelopment water balance consistent with or exceeding provincial standards or guidance. Understanding that the provincial guidance has not yet been finalized, the current recommendation is: a. through the control hierarchy of: i. retention (i.e. infiltration, reuse, or evapotranspiration) ii. LID volume capture and release (i.e. LID filtration) iii. stormwater volume detention and release (only once maximum control from steps i and ii have been exhausted) b. shall strive to meet the hydrology model recommended watershed runoff volume control target of the 90th percentile of a 12-hour event, where rainfall depth is approximately 27-29 mm c. shall adhere to best practices for water quality, erosion, and sediment control **Revised text (in bold)**: Municipal partners, in collaboration with TRCA, to adopt green development policies, or standards, requiring new developments and redevelopments, to utilize low impact development and green infrastructure techniques to limit the impacts of impervious cover and maintain predevelopment water balance consistent with or exceeding provincial standards or guidance. Understanding that the provincial guidance has not yet been finalized, the current recommendation is: a. through the control hierarchy of: i. retention (i.e. infiltration, reuse, or evapotranspiration) ii. LID volume capture and release (i.e. LID filtration) iii. stormwater volume detention and release (only once maximum control from steps i and ii have been exhausted) b. shall strive to meet the hydrology model recommended watershed runoff volume control target of the 90th percentile of a 12-hour event, where rainfall depth is approximately 27-29 mm c. shall adhere to best practices **and standards** for water quality, erosion, and sediment control
	• Management Action 1.1.2 was revised. **Original text:** Municipal partners, in collaboration with TRCA, to review and update existing policies, bylaws, guidelines, standards, secondary plans, and master plans to: a. ensure consistency with the goals and objectives of this watershed plan b. ensure best practices are implemented and the highest standards applied across the watershed for matters related to: i. safeguarding against natural hazard risks ii. Water Resource System and Natural Heritage System protection, enhancement, and restoration iii. improving water quality and protecting water quantity for drinking water and ecological needs c. establish a policy evaluation process to assess the effectiveness of policy frameworks consistent with the monitoring of watershed and local trends (i.e. if indicators are not improving, what needs to be done?) **Revised text (in bold):** Municipal partners, in collaboration with TRCA, to review and update existing policies**/Official Plans**, bylaws, guidelines, standards, secondary plans, and master plans to: a. ensure consistency with the goals and objectives of this watershed plan

ECWP Section	Key Revisions to the ECWP
	b. ensure best practices are implemented and the highest standards applied across the watershed for matters related to: i. safeguarding against natural hazard risks ii. Water Resource System and Natural Heritage System protection, enhancement, and restoration iii. improving water quality and protecting water quantity for drinking water and ecological needs **c.** establish a policy evaluation process to assess the effectiveness of policy frameworks consistent with the monitoring of watershed and local trends (i.e. if indicators are not improving, what needs to be done?)
	• Management Action 1.1.3 was revised. **Original text:** Prior to the construction of the GTA West Highway, if approved, the Ministry of Transportation should include in design and construction authorizations: a. appropriate mitigation measures to ensure the natural hazard risks of flooding and erosion will not increase b. appropriate mitigation measures to demonstrate how the Natural Heritage System and Water Resource System will be protected, enhanced, and restored, including ecosystem compensation (once the protection hierarchy of avoid, minimize, and mitigate has been applied) c. appropriate mitigation measures to maintain ecological function and wildlife connectivity **Revised text (in bold):** Prior to the construction of **Highway 413**, if approved, the Ministry of Transportation should include in **the design:** a. appropriate mitigation measures to ensure the natural hazard risks of flooding and erosion will not increase **or are managed in accordance with Provincial guidelines and policies and TRCA's Voluntary Project Review process.** b. appropriate mitigation measures to demonstrate how the Natural Heritage System and Water Resource System will be **protected and restored**, including ecosystem compensation (once the protection hierarchy of avoid, minimize, and mitigate has been applied) c. appropriate mitigation measures to maintain ecological function and wildlife connectivity
	• Management Action 1.2.1 was revised. **Original text:** Municipal partners, in collaboration with TRCA, to prioritize on-site control through LID or green infrastructure in the priority areas identified on Map 1, or as opportunities arise through municipal capital planning for linear projects (i.e. road improvements) or other initiatives (e.g. sustainable community retrofit projects). **Revised text (in bold):** Municipal partners, in collaboration with TRCA, to prioritize on-site control through LID or green infrastructure **implementation as much as possible based on site conditions (see Map 1 for areas in the watershed that would benefit the most from LID or green infrastructure implementation to help with natural/pre-development water balance)** or as opportunities arise through municipal capital planning for linear projects (i.e. road improvements) or other initiatives (e.g. sustainable community retrofit projects **such as TRCA's Sustainable Neighbourhood Action Program**).
	• Management Action 1.3.3 was removed as Management Action 1.3.1.b covers development of outreach initiatives to educate the public on roles/responsibilities when living in a flood risk area. **Original Management Action 1.3.3 Removed:** TRCA, in collaboration with municipal partners, to educate property owners in high flood risk areas about proper lot level practices (e.g. removing hydraulic impairments).
	• Management Action 1.3.6 and Map 2 were removed (as remediation of infrastructure hazard sites at risk of erosion is covered in Management Action 1.3.4 and since some of the sites in Map 2 have already been remediated). Management Actions 1.3.3 to 1.3.5 were renumbered.

ECWP Section	Key Revisions to the ECWP
	Original Management Action 1.3.6 Removed: TRCA will continue to work towards remediating infrastructure hazard sites at risk of erosion on a reach-based approach in collaboration with municipal partners (see Map 2 for 11 sites forecasted for remediation between 2019 and 2029).
	• Management Action 1.3.5 was revised. **Original text:** TRCA will regularly collect Light Detection and Ranging (LiDAR) data to allow for robust geospatial analyses of significant terrain movement, and to monitor erosion hazards threatening essential infrastructure and degrading erosion control structures (TRCA assets), and will provide accurate base mapping for flood mapping and modelling projects. **Revised text (in bold):** TRCA will regularly collect Light Detection and Ranging (LiDAR) data **(or data using other appropriate and available technology)** to allow for robust geospatial analyses of significant terrain movement, and to monitor erosion hazards threatening essential infrastructure and degrading erosion control structures (TRCA assets), and will provide accurate base mapping for flood mapping and modelling projects.
Section 5.2 Water Resource System Goal	• Management Action 2.1.4 was revised. **Original text:** TRCA, in collaboration with municipal partners, to prioritize the restoration of aquatic sites identified on Map 4A and Map 4B, which have been selected for contributing to the following: a. enhancing habitat quality and watershed connectivity b. enhancing natural cover within riparian corridor c. ensuring biodiversity persists d. improving watershed resiliency to climate change **Revised text (in bold):** TRCA, in collaboration with municipal partners, to prioritize the restoration of aquatic sites identified on **Map 3A** and **Map 3B**, which have been selected for contributing to the following: a. enhancing habitat quality and watershed connectivity b. enhancing natural cover within riparian corridor c. ensuring biodiversity persists d. improving watershed resiliency to climate change **NOTE: Municipalities may have their own restoration priorities (outlined in various municipal strategies and park plans) in addition to these priority restoration sites. This watershed plan encourages restoring as much habitat as possible across the watershed.**
Section 5.3 Natural Heritage System and Urban Forest Goal	• This goal, Table 10 and objectives in Table 10 were updated to include the urban forest as well as the Natural Heritage System.
	• The recommended guidelines for natural cover (at least 30%) were added to the introductory section.
	• Management Action 3.1.3 was revised. **Original text:** TRCA, in collaboration with municipal partners, and the Greater Toronto Airports Authority, to prioritize the restoration and enhancement of the terrestrial sites identified on Map 4A and Map 4B (while ensuring aviation safety), which have been selected for contributing to: a. increasing habitat quantity b. enhancing habitat quality and connectivity

ECWP Section	Key Revisions to the ECWP
	c. ensuring biodiversity persists d. reducing climate vulnerabilities **Revised text (in bold):** TRCA, in collaboration with municipal partners, and the Greater Toronto Airports Authority, to prioritize the restoration and enhancement of the terrestrial sites identified on **Map 3A** and **Map 3B** (while ensuring aviation safety), which have been selected for contributing to: a. increasing habitat quantity b. enhancing habitat quality and connectivity c. ensuring biodiversity persists d. reducing climate vulnerabilities **NOTE: Municipalities may have their own restoration priorities (outlined in various municipal strategies and park plans) in addition to these priority restoration sites. This watershed plan encourages restoring as much habitat as possible across the watershed.**
	• Management Action 3.1.5 was revised. **Original text:** All municipalities, in collaboration with TRCA and the Greater Toronto Airports Authority, are to expand the Etobicoke Creek trail network to create a connected and safe active recreation network from Lake Ontario to the Headwaters that minimizes potential impacts to the Natural Heritage System by: a. ensuring proper trail management and signage b. providing education and outreach on the importance of the Natural Heritage System c. promoting community stewardship to maintain and monitor the Natural Heritage System for improper trail usage (e.g. off-trail compaction and erosion), illegal dumping, and invasive species, while encouraging community restoration programs (e.g. tree plantings) d. engaging with MCFN to develop interpretative trail signage on the importance of water and the relationship between Treaties and the Etobicoke Creek, and include appropriate Indigenous placemaking **Revised text (in bold):** All municipalities, in collaboration with TRCA and the Greater Toronto Airports Authority, are to expand **the trail network in the Etobicoke Creek watershed** to create a connected and safe active recreation network from Lake Ontario to the Headwaters **and to neighbouring watersheds (based on TRCA's Trail Strategy for the Greater Toronto Region 2019, the Province-wide Cycling Network, and municipal trail and active transportation strategies)** that minimizes potential impacts to the Natural Heritage System by: a. ensuring proper trail management and signage b. **engaging trail users by** providing education and outreach on the importance of the Natural Heritage System c. promoting community stewardship to maintain and monitor the Natural Heritage System for improper trail usage (e.g. off-trail compaction and erosion), illegal dumping, and invasive species, while encouraging community restoration programs (e.g. tree plantings) **d. collaborating, when possible, to manage problematic invasive species** e. engaging with MCFN to develop interpretative trail signage on the importance of water and the relationship between Treaties and the Etobicoke Creek, and include appropriate Indigenous placemaking
	• Management Action 3.2.1 was revised.

ECWP Section	Key Revisions to the ECWP

Original text: The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, will undertake strategic tree planting as per the priority planting areas identified on Map 10 to achieve tree canopy cover targets for each subwatershed, or municipality, as follows:

Lower Etobicoke = 23.3%	City of Toronto = 24%
Main Branch = 15%	City of Mississauga = 12.5%
Tributary 3 = 12.2%	City of Brampton = 20%
Tributary 4 = 14.7%	Town of Caledon = 11.3%
Little Etobicoke = 15.1%	
Spring Creek = 16%	
Headwaters (Greenbelt portion) = 13.3%	

Note: See management action 3.2.2 for the non-Greenbelt portion of the Headwaters. Municipalities may have specific canopy cover targets that exceed these watershed targets. This watershed plan encourages achieving the highest possible amount of canopy cover across the watershed.

Revised text (in bold): The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, will undertake strategic tree planting as per the priority planting areas identified on **Map 9** to achieve tree canopy cover targets for each subwatershed, or municipality, as follows:

Lower Etobicoke = 23.3%	City of Toronto = 24%
Main Branch = 15%	City of Mississauga = 12.5%
West Branch = 19.6%	City of Brampton = 20%
Tributary 3 = 12.2%	Town of Caledon = 11.3%
Tributary 4 = 14.7%	
Little Etobicoke **Creek** = 15.1%	
Spring Creek = 16%	
Headwaters (Greenbelt portion) = 13.3%	

Note: See management action 3.2.2 for the non-Greenbelt portion of the Headwaters. Municipalities may have specific canopy cover targets that exceed these watershed targets. This watershed plan encourages achieving the highest possible amount of canopy cover across the watershed.

- Management action 3.2.3 was revised.

Original text: The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, will develop, or update, urban forest management plans or strategies that:

a. enhance tree and soil conservation in accordance with Preserving and Restoring Healthy Soil: Best Practices for Urban Construction at all public and private property
b. implement the tree canopy cover targets as identified in management action 3.2.1 by focusing planting in the priority areas identified on Map 10

ECWP Section	Key Revisions to the ECWP
	c. identify and promote opportunities for sustainable community retrofits in the priority areas identified on Map 10 d. encourage an urban forest with diverse and native (or non-invasive) tree species and class sizes e. ensure consistent policies and bylaws for tree conservation on public and private lands f. develop, or expand, programs for native tree planting on public and private lands **Revised text (in bold):** The City of Toronto, Region of Peel, and lower-tier municipalities, in collaboration with TRCA, will develop, or update, urban forest management plans or strategies that: a. enhance tree and soil conservation in accordance with Preserving and Restoring Healthy Soil: Best Practices for Urban Construction at all public and private property b. implement the tree canopy cover targets as identified in management action 3.2.1 by focusing planting in the priority areas identified on **Map 9** c. identify and promote opportunities for sustainable community retrofits **(for example through TRCA's Sustainable Neighbourhood Action Program**) in the priority areas identified on **Map 9** d. encourage an urban forest with diverse and native (or non-invasive) tree species and class sizes e. ensure consistent policies and bylaws for tree conservation on public and private lands f. develop, or expand, programs for native tree planting on public and private lands
Section 6 Implementation, Monitoring and Evaluation	• The title of this section was changed from 'Monitoring and Evaluation' to 'Implementation, Monitoring and Evaluation' and bolded text was added. **The following sections provide an overview of the process that will be used for implementation, tracking, and reporting of the Etobicoke Creek Watershed Plan, and provide information on the inventory, monitoring, and evaluation that will take place to continue to evaluate the health of the Etobicoke Creek watershed as well as the adaptive management plan.**
Section 6.1 Implementation, Tracking and Reporting of the Etobicoke Creek Watershed Plan	• This new section was added with information on next steps, implementation, tracking, and reporting for the ECWP, and the establishment of an Implementation Steering Committee to guide implementation.
Section 6.2 Inventory, Monitoring and Evaluation	• The original Monitoring and Evaluation information (in this new Section 6.2) was revised to include reference to inventory and research (as well as monitoring) work for the ECWP. It was also noted that this work will be undertaken by TRCA with support from partner municipalities. • A note was added to **Figure 16 (Monitoring Stations)** to confirm that inventory locations are not shown on **Figure 16** as they will be determined on a yearly basis based on where data updates are required. The **Table 11** title was changed from 'Monitoring Program' to 'Monitoring / Inventory Program' and a note was added to confirm again that inventory work is determined on a yearly basis based on where data updates are required, and that inventory work can include vegetation community polygon mapping, flora and fauna species of concern mapping, and full species site lists.
Section 6.3 Adaptive Management	• The Adaptive Management information (new Section 6.3) was updated to note that adaptive management, in conjunction with **inventory**, monitoring, **and research** programs, may lead to refinements of the management framework, or the number of monitoring stations, throughout the life of the watershed plan.

ECWP Section	Key Revisions to the ECWP
	• A new story box was added to provide some information about wildlife movement and habitat connectivity in the Etobicoke Creek watershed with a focus on the road ecology surveys along Heart Lake Road from Mayfield Road to Sandalwood Parkway in Brampton and the installation of dedicated wildlife culverts under Heart Lake Road to allow safe passage for wildlife.
Section 7 Maps	• Map numbers were updated throughout the ECWP (since Map 2 Infrastructure Hazard Sites was removed), and all Maps were included in the Table of Contents for easier reference. In addition, the bolded text was added in a new box. **The maps in this section, along with a map viewer showing many of the mapping layers, can be viewed in the online interactive Etobicoke Creek Watershed Plan here.**
	• Map 1 was updated to change the title from 'Priority Areas for LID/Green Infrastructure' to 'Areas Recommended for LID/GI Implementation'. The description of Map 1 was updated (see bolded text). This map shows **areas in the watershed that would benefit the most from low impact development (LID) or green infrastructure (GI) implementation to help regain natural or pre-development water balance. Areas in red are those that would benefit the most from the use of LID or green infrastructure implementation.** **Appendix B contains information on how the areas were determined.** **This map is meant to be used as a preliminary screening tool. Additional detailed site-level investigations and technical studies will be required to obtain local/site level information to help assess the suitability of the use of LIDs or green infrastructure in these areas based on site conditions.**
	• Map 2 showing the infrastructure hazard sites forecasted for remediation to reduce erosion risk between 2019 and 2029 was removed since remediation has already taken place at a number of these sites.
	• Map 3B (originally Map 4B) and Table 13 were updated to clarify that they show the priority restoration sites by subwatershed (not necessarily top 5 sites in each subwatershed).
	• Map 4 (originally Map 5) showing the location of the Brampton Esker was updated.
Section 9 References	• A number of new references were added to this section.
Appendix B LID Implementation Case Study	• This section was updated to note that Map 1 shows areas in the watershed that would benefit the most from LID or green infrastructure implementation to help regain natural or pre-development water balance (rather than priority catchments for on-site control through the use of LID). Information on how Map 1 was developed was added. In addition, it was noted that costs provided in **Table 15 LID Implementation Case Study Costing** are an approximation based on 2023 construction/maintenance prices for the LIDs – and would vary based on market prices/conditions.
Appendix B Terrestrial and Aquatic Restoration Priorities	• The costing information was removed from this section (including the original **Table 17 Restoration Costing for Top 10 Watershed Sites)** since costing for restoration is contingent on current market prices and conditions and can change significantly from year to year.
	• New text in bold was added. **Municipalities may have their own restoration priorities (outlined in various municipal strategies and park plans) in addition to the priority restoration sites identified in Map 3A and Map 3B. This watershed plan encourages restoring as much habitat as possible across the watershed. TRCA will continue to work collaboratively with our partner municipalities during implementation of the ECWP to investigate opportunities and alignments throughout the watershed for various projects including restoration and channel naturalization, plantings, and the creation of outdoor classrooms and natural style playgrounds, some of which could also become 'signature watershed sites'. This collaborative work will help meet the goals and objectives of the ECWP to enhance and restore the natural heritage system in the watershed.**

ECWP Section	Key Revisions to the ECWP
Appendix B Urban Forest Priorities	• The bolded text was added in a new box to provide additional information about the priority areas for planting to increase the urban forest canopy cover in the watershed. **Priority areas for planting to enhance the urban forest canopy in the Etobicoke Creek watershed are not proposed in natural areas. Instead, the urban forest priority planting areas are focused on areas outside of the NHS (i.e. outside of existing and potential natural cover areas) within the contributing areas of the NHS (areas not suitable for restoration but areas that can still provide additional habitat/connectivity through use of LIDs/GI), within ESGRAs and areas with lower canopy cover percentages, and in proximity to the WRS. Social and municipal criteria was also used to identify priority planting areas including heat vulnerability and known municipal priorities like Brampton no-mow areas.** **Restoration opportunities in natural areas of the Etobicoke Creek watershed are identified as part of the watershed refined enhanced NHS (generally in potential natural cover areas shown in Map 6) and the priority restoration sites (including plantings/enhancement of forest, riparian, wetland, and shoreline habitat) as shown in Maps 3A and 3B**.
	• Additional information was added to clarify how the number of potential trees was computed (see bolded text). **The number of potential trees to be planted was computed using planting densities specific to each land use type and the assumption that a medium-stature tree would be planted**. **The canopy cover enhancements do not include increases through underplanting. The Etobicoke Creek Watershed Future Management Scenario Analysis Report (Table 18 Urban Forest Planting Assumptions) provides further information on tree planting assumptions and densities.** **Available planting areas vary greatly if social and municipal criteria are considered in addition to ecological and hydrological criteria. For example, and as shown in Table 17, the Headwaters has a much lower number of trees in Tier 1 compared to Tier 2.**
	• Table 17 (**Canopy Cover Enhancements by Tier**) was updated (from Table 18 in draft ECWP) and the costing information was removed since urban tree planting costs are contingent on current market prices of stock and market conditions and can change significantly from year to year.

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Toronto and Region Conservation Authority

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Anil Wijesooriya, Director, Restoration and Infrastructure

RE: **REQUEST FOR TENDER FOR SUPPLY AND DELIVERY OF 600-1000MM RIP RAP TO CLIFF LUMSDON PARK MAJOR MAINTENANCE PROJECT–LAND BASED DELIVERY**
RFT No. 10042055

KEY ISSUE

Award of Request for Tender (RFT) No. 10042055 for Supply and Delivery of 8,000 tonnes of 600 – 1000mm Rip Rap to Cliff Lumsdon Park Major Maintenance Project – Land Based Delivery.

RECOMMENDATION:

WHEREAS Toronto and Region Conservation Authority (TRCA) is engaged in a project that requires Supply and Delivery of 600 – 1000mm Rip Rap;

AND WHEREAS TRCA solicited tenders through a publicly advertised process;

THEREFORE BE IT RESOLVED THAT RFT No. 10042055 for Supply and Delivery of 600 – 1000mm Rip Rap to Cliff Lumsdon Park Major Maintenance Project be awarded to Gott Natural Stone '99 Inc. at a total cost not to exceed $539,040.00, plus applicable taxes, to be expended as authorized by TRCA staff;

THAT TRCA staff be authorized to approve additional expenditures to a maximum of $53,904.00 (approximately 10% of the project cost), plus applicable taxes, in excess of the contract cost as a contingency allowance if deemed necessary;

THAT should TRCA staff be unable to negotiate a contract with the above-mentioned proponent, staff be authorized to enter into and conclude contract negotiations with other Proponents that submitted quotations, beginning with the next lowest bid meeting TRCA specifications;

AND FURTHER THAT authorized TRCA officials be directed to take

whatever action may be required to implement the contract, including the obtaining of necessary approvals and the signing and execution of any documents.

BACKGROUND

Cliff Lumsdon Park is a public park located along the north shore of Lake Ontario at 101 Lake Shore Drive, Etobicoke, City of Toronto. The park is 200 meters across and features an armourstone and rubble revetment that provides shoreline erosion protection along approximately 290 m of its length.

From annual inspections through TRCA's Erosion Hazard Monitoring Program (EHMP) has been monitoring this revetment since 2006 and in 2008, the structure was identified as "At Risk." In 2014, the status was upgraded from "At Risk" to "Failing" and has remained in a failing condition ever since.

In 2018, TRCA commissioned Riggs Engineering Ltd. (Riggs) to develop the Western Waterfront Major Maintenance Strategy (WWFMMS) that assessed the conditions of shoreline erosion control structures in the western area of the City of Toronto. The report highlighted deficiencies in Cliff Lumsdon Park such as displacement of armourstone and rubble material, resulting in exposure and scouring of the backshore and slumping of the bank. The WWFMMS identified that to maintain this structure, new material would need to be brought to site as the existing revetment does not contain enough material to build out the footprint to the appropriate size for backshore erosion protection. The existing rubble material is suitable to be incorporated as core material because much of the rubble is reinforced with rebar and currently presents a public safety risk.

TRCA procured Riggs again in early 2023 to undertake the coastal analysis and detailed design for the repair and restoration of long-term erosion control structures along the shoreline of Cliff Lumsdon Park. Of the three design concepts presented by Riggs, TRCA determined that the berm revetment was the preferred design due to its smaller construction footprint and less stringent material requirements.

To implement these designs, TRCA requires supply and delivery of rip rap aggregate material for the berm revetment. The stone deliveries will access the site from Sixth Street, unload stone materials within the site and egress the site to head north on Seventh Street. Refer to Attachment 2 for a map of the site access, egress, staging area and work area details.

RATIONALE

An RFT for general contractors was publicly advertised on the public procurement website www.biddingo.com on September 11, 2024. A mandatory meeting and site tour was held on September 19, 2024. One (1) addendum was issued to respond to questions received. The RFT closed on September 25, 2024.

A total of twelve (12) firms downloaded the documents and four (4) submissions were received from the following Proponent(s):

- CDR Young's Aggregates (Disqualified)
- Doornekamp Construction
- Gott Natural Stone '99 Inc.
- J.C. Rock Ltd.

The Procurement Opening Committee opened the Tenders on September 25, 2024, with the following results:

Contract No. 10042055 - Supply and Delivery of 8,000 tonnes of 600 – 1000mm Rip Rap to Cliff Lumsdon Park Major Maintenance Project

Proponent	Fee (Plus HST)
Gott Natural Stone '99 Inc.	$ 539,040.00
Doornekamp Construction	$ 557,200.00
J.C. Rock Ltd.	$ 557,520.00
CDR Young's Aggregates	$ 581,040 (Disqualified)

The bid from CDR Young's Aggregates was disqualified because they did Not submit the Agreement to Bond as specified in the tender document.

Staff reviewed the bid received from Gott Natural Stone '99 Inc. against its own cost estimate and has determined that the bid is of reasonable value and meets the requirements as outlined in the RFT documents. Therefore, it is recommended that contract No. 10042055 be awarded to Gott Natural Stone '99 Inc. at a total cost not to exceed $ 539,040. plus 10% contingency, plus applicable taxes, it being the lowest bid meeting TRCA’s specifications.

Relationship to TRCA's 2023-2034 Strategic Plan
This report supports the following Pillar and Outcome set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 1 Environmental Protection and Hazard Management:
1.1 Deliver provincially mandated services pertaining to flood and erosion hazards

FINANCIAL DETAILS
This project is funded by the City of Toronto and also received federal grant funding from Infrastructure Canada's Disaster Mitigation Adaptation fund. The cost of executing this contract, including all staff time and associated costs to manage the project, is being tracked under account 241-04.

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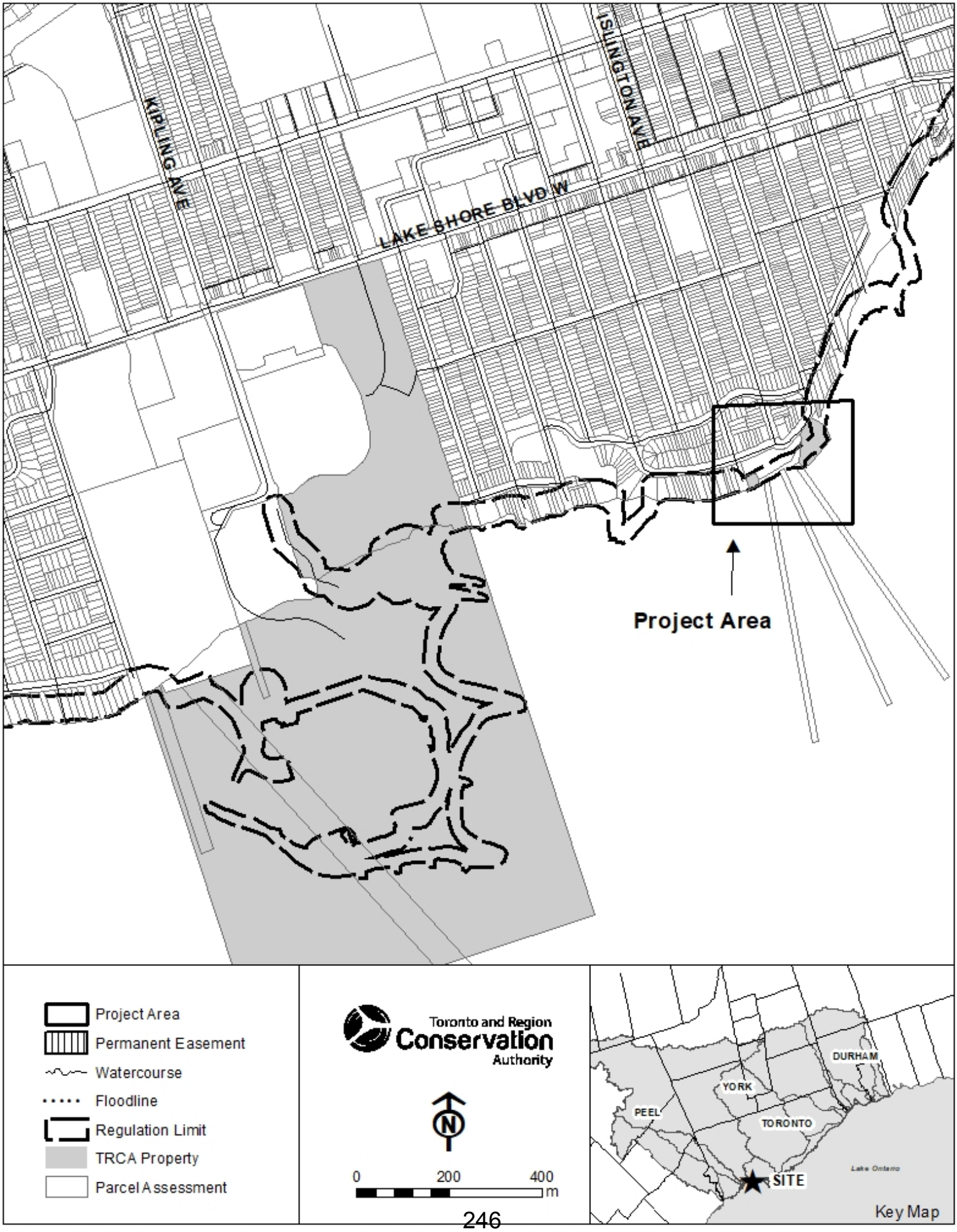
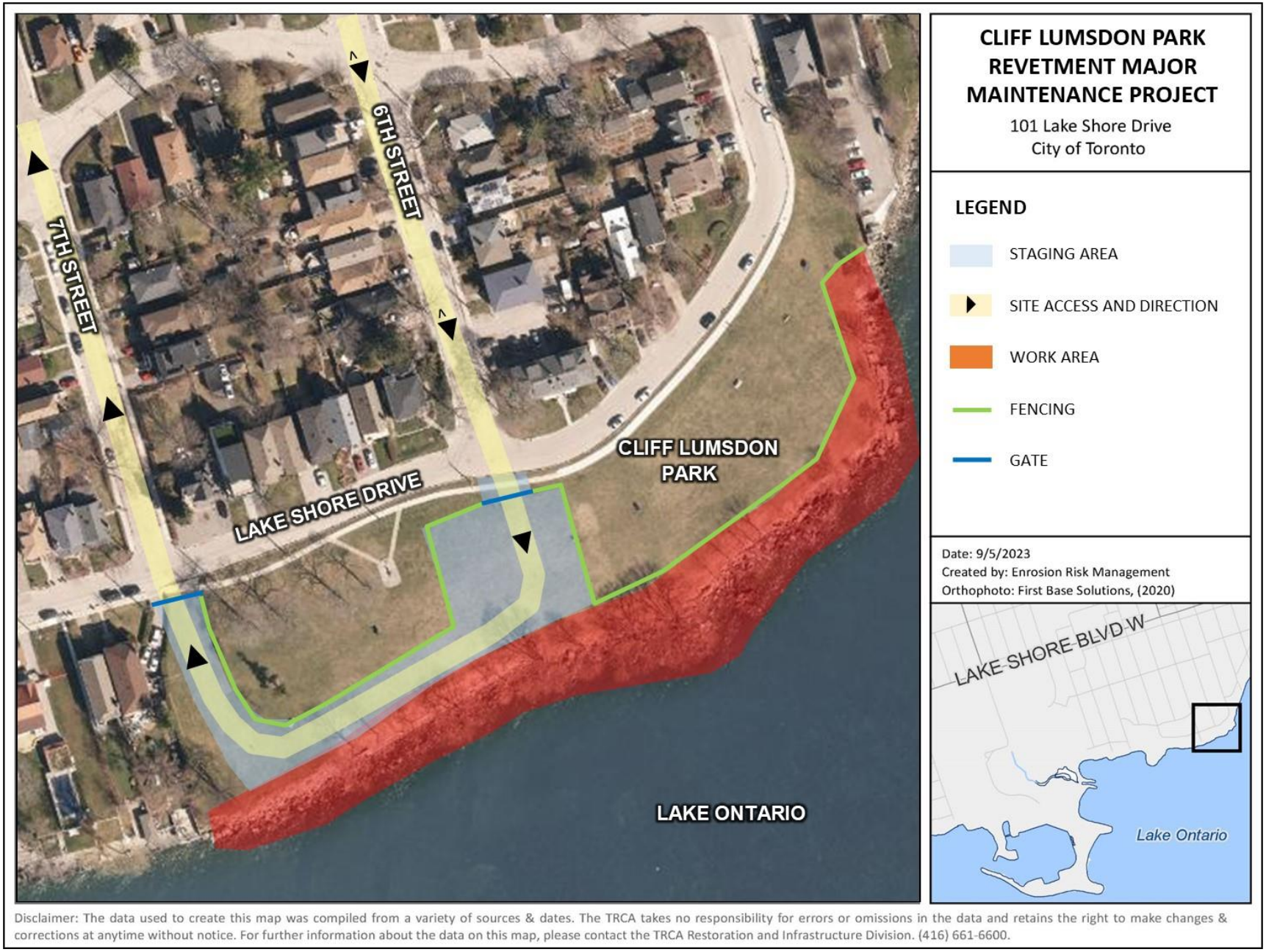
Date: September 25, 2024
Attachments: 2

Attachment 1: Project Location Map
Attachment 2: Cliff Lumsdon Site Access

Attachment 1-Project Location Map



Attachment 2 - Cliff Lumsdon Site Access



Disclaimer: The data used to create this map was compiled from a variety of sources & dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes & corrections at anytime without notice. For further information about the data on this map, please contact the TRCA Restoration and Infrastructure Division. (416) 661-6600.

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Richard Ubbens, Director, Conservation Parks and Lands

RE: **REQUEST FOR QUOTATION FOR RFT 10042061 PICNIC SHELTERS AT ALBION HILLS AND GLEN HAFFY CONSERVATION PARKS**
RFT No. 10042061

KEY ISSUE

Award of Request for Tender (RFT) No. 10042061 for construction of picnic shelters at Albion Hills and Glen Haffy Conservation Parks.

RECOMMENDATION:

WHEREAS Toronto and Region Conservation Authority (TRCA) is engaged in a project that requires construction of five (5) picnic shelters at two (2) conservation parks;

AND WHEREAS TRCA solicited quotations through a publicly advertised process;

THEREFORE LET IT BE RESOLVED THAT RFT No. 10042061 for the picnic shelters at Albion Hills and Glen Haffy Conservation Parks be awarded to Unique Builders Inc. at a total cost not to exceed $531,227.69, plus applicable taxes, to be expended as authorized by TRCA staff;

THAT TRCA staff be authorized to approve additional expenditures to a maximum of $53,122.77 (approximately 10% of the project cost), plus applicable taxes, in excess of the contract cost as a contingency allowance if deemed necessary;

THAT should TRCA staff be unable to negotiate a contract with the above-mentioned proponent, staff be authorized to enter into and conclude contract negotiations with other Proponents that submitted quotations, beginning with the next lowest bid meeting TRCA specifications;

AND FURTHER THAT authorized TRCA officials be directed to take whatever action may be required to implement the contract, including

the obtaining of necessary approvals and the signing and execution of any documents.

RATIONALE

A Request for Tender (RFT) was publicly advertised on the public procurement website www.bidsandtenders.ca on September 25, 2024 and closed on October 28, 2024. A mandatory meeting and site tour was held on October 1, 2024. Three (3) addendums were issued to respond to questions received.

A total of thirty (30) firms downloaded the documents and ten (10) quotations were received from the following Proponent(s):

- Arenes Construction Ltd.
- Bomar Landscaping Inc.
- Landco Group Inc.
- Lyndon Construction Inc.
- Melrose Paving Co. LTD
- ONIT Construction Inc.
- Pine Valley Corporation
- Three Seasons Landscape Limited
- Unique Builders Inc.
- W.S.Morgan Construction Limited.

The Procurement Opening Committee opened the quotations on October 29, 2024 with the proponents listed from lowest to highest bid value in the following table.

Proponent	Fee (Plus HST)
Unique Builders Inc.	$531,228.00
Bomar Landscaping Inc.	$637,881.00
Lyndon Construction Inc.	$658,597.00
Pine Valley Corporation	$751,503.00

Three Seasons Landscape Limited	$766,931.00
Landco Group Inc.	$768,754.00
ONIT Construction Inc.	$885,921.00
Arenes Construction Ltd.	$929,112.00
Melrose Paving Co. LTD	$1,037,027.00
W.S.Morgan Construction Limited	$1,128,079.00

Staff reviewed the bid received from Unique Builders Inc. against its own cost estimate and has determined that the bid is of reasonable value and meets the requirements as outlined in the RFT documents. Therefore, it is recommended that contract No. 10042061 be awarded to Unique Builders Inc. at a total cost not to exceed $531,227.69, plus 10% contingency, plus applicable taxes, it being the lowest bid meeting TRCA's specifications.

Relationship to TRCA's 2023-2034 Strategic Plan
This report supports the following Pillar and Outcome set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 3 Community Prosperity:
3.1 Connect communities to nature and greenspace

FINANCIAL DETAILS
Funds for the contract are identified in 440-58 and 302-01.

Report prepared by: Brian Bertrand Supervisor, Conservation Lands
Email: brian.bertrand@trca.ca
For Information contact: Brian Bertrand, (416) 409 3522
Email: brian.bertrand@trca.ca
Date: November 1, 2024

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Anil Wijesooriya, Director, Restoration and Infrastructure

RE: **VENDORS OF RECORD ARRANGEMENT FOR SUPPLY AND DELIVERY OF VARIOUS AGGREGATES – CONTRACT VALUE EXTENSION**
Contract No. 10039254

KEY ISSUE

Value extension of Contract 10039254 - Vendors of Record (VOR) arrangement for supply and delivery of various aggregates.

RECOMMENDATION:

WHEREAS Toronto and Region Conservation Authority (TRCA) is engaged in a variety of programs/projects that require the supply and delivery of a variety of aggregate materials;

WHEREAS TRCA solicited proposals through a publicly advertised process and awarded Contract No. 10039254 to Brock Aggregates, Dufferin Aggregates, Glenn Windrem Trucking, Gott Natural Stone ’99 Inc., J.C. Rock Ltd., James Dick Construction Ltd., Miller Paving Products, and Roman Building Materials at Board of Directors Meeting RES.#A107/23;

WHEREAS TRCA staff are satisfied with the goods and services provided to date under the current contract;

AND WHEREAS TRCA staff have observed a significant increase in demand for aggregate materials at TRCA projects than originally forecasted;

THEREFORE LET IT BE RESOLVED THAT TRCA staff be authorized to increase the value of Contract No. 10039254 by an additional $2,386,000, plus applicable taxes, to account for additional spending forecasted to reach completion of the term;

AND FURTHER THAT authorized TRCA officials be directed to take whatever action may be required to implement this contract value extension, including the obtaining of necessary approvals and the

signing and execution of any documents.

BACKGROUND

TRCA requires the supply and delivery of various aggregates to implement a range of engineering, habitat restoration, and trail building projects throughout TRCA jurisdiction. There are five (5) categories of aggregate utilized by TRCA staff to support project implementation, which include:

1. Granular
2. Gabion & Rip-rap
3. Stackable Armour Stone
4. Non-stackable Armour Stone
5. Round Stone

Through the current VOR arrangement, vendors are authorized to provide the specified goods and services for a defined period and with fixed pricing. In accordance with the contract documents for this VOR, staff may contact any vendor on the list with the type of aggregate and delivery capability required to meet their project needs with a value up to $500,000 per aggregate type and size, per project, per annum. Aggregate goods and services above this threshold are procured through a separate bidding process subject to TRCA's Procurement Policy.

Furthermore, where vendors on the VOR list do not have the aggregate materials available for a particular project meeting the specifications required for TRCA to meet its deliverables, staff are authorized to procure required aggregate materials separate of this VOR following TRCA's Procurement Policy.

All vendors on the VOR list are required to provide all resources required to service the divisional or program needs in accordance with applicable laws, codes, standards, terms, and conditions of the VOR agreement.

At the Board of Directors Meeting held on June 23, 2023, Resolution #A 107/23 was approved in part as follows:

> THEREFORE LET IT BE RESOLVED THAT TRCA staff be directed to award Request for Proposal (RFP) No. 10039254 to Brock Aggregates, Dufferin Aggregates, Glenn Windrem Trucking, Gott Natural Stone '99 Inc., J.C. Rock Ltd., James Dick Construction Ltd.,

Miller Paving Products, and Roman Building Materials for the supply and delivery of various aggregates from July 1, 2023 to July 1, 2024 for a total cost not exceeding $3,800,000, plus applicable taxes, to be expended as authorized by TRCA staff;

THAT TRCA staff be authorized to approve additional expenditures to a maximum of $570,000 (15% of anticipated expenditures), plus applicable taxes, in excess of the contract cost as a contingency allowance if deemed necessary;

AND THAT TRCA staff have the option to extend the term of the contract by one (1) year pending further Board of Director approval.

Furthermore, at the Board of Directors Meeting held on April 19, 2024, Resolution #A 63/24 was approved in part as follows:

THEREFORE LET IT BE RESOLVED THAT TRCA staff be directed to exercise their contractual right to extend the VOR arrangement with Brock Aggregates, Dufferin Aggregates, Glenn Windrem Trucking, Gott Natural Stone ’99 Inc., J.C. Rock Ltd., James Dick Construction Ltd., Miller Paving Products, and Roman Building Materials for an additional one (1) year to expire on July 1, 2025;

AND THAT TRCA staff be authorized to increase the value of Contract No. 10039254 by an additional $1,618,267, plus applicable taxes, to account for additional spending anticipated for the one (1) year term extension;

RATIONALE

While TRCA staff have made reasonable effort to accurately forecast expenditures under this VOR using existing expenditure data and project knowledge, an increased demand for aggregate materials at TRCA’s construction sites has led to an overall increase in expenditures under this VOR contract and is forecasted to continue until the end of the contract term. This increase exceeds the original estimate for the contract and the contract term extension, approved at previous TRCA Board of Director meetings.

TRCA staff have developed an updated estimate based on forecasted projects to be implemented before the completion of the contract term on

July 1, 2025. Projects forecasted to have a significant demand for deliveries of aggregate under this contract include, but are not limited to:

- Ashbridges Bay Treatment Plant Landform Project
- Jim Tovey Lakeview Conservation Area Project
- Cliff Lumsdon Park Major Maintenance Project
- Bluffer's Park Central Major Maintenance Project
- Newtonbrook Creek Bridge Replacement Project
- Colonel Sam Smith Park Major Maintenance Project
- Centennial Park Restoration Project
- Loafers Lake Shoreline Restoration
- Rowntree Mills Wetland Enhancements

Additional projects may be established as funding is secured with TRCA's project partners.

It is estimated that to continue to deliver to TRCA's projects until the completion of the contract term, an additional $2,386,000, plus applicable taxes will be required.

Relationship to TRCA's 2023-2034 Strategic Plan

This report supports the following Pillars and Outcomes set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 1 Environmental Protection and Hazard Management:

1.1 Deliver provincially mandated services pertaining to flood and erosion hazards

Pillar 4 Service Excellence:

4.3 Responsive relationships and a trusted brand with a reputation for excellence

FINANCIAL DETAILS

As of October 23, 2024, the contract (July 1, 2023 – July 1, 2025) has been in place for 15 months and is 61% complete. Funds allocated to this contract as of October 23, 2024 have amounted to $5,710,461, plus applicable taxes. It is forecasted that the remaining 9 months of the contract term will bring the estimated total allocation to $8,096,461, plus applicable taxes.

Considering the above forecasted funding allocations, the anticipated value

extension required to reach term completion for the VOR contract would be a total of $2,386,000, plus applicable taxes.

Report prepared by: Alex Barber, Senior Project Manager
Email: alex.barber@trca.ca
For Information contact: Mike Puusa, (647) 212-2941
Email: mike.puusa@trca.ca
Date: October 23, 2024

Item 8.7

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Kathryn Lockyer, Director, Legislative and Property Services

RE: **DISPOSITION TO THE MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS FOR CREATION OF UXBRIDGE URBAN PROVINCIAL PARK**
Request from Ministry of the Environment, Conservation and Parks for Conveyance of Toronto and Region Conservation Authority-owned Lands Required for the creation of Uxbridge Urban Provincial Park, Township of Uxbridge, Regional Municipality of Durham, Duffins Creek Watershed (CFN 71328)

KEY ISSUE

Receipt of a request from the Ministry of Environment, Conservation and Parks (MECP) for conveyance of Toronto and Region Conservation Authority (TRCA) owned lands located in the Township of Uxbridge, Regional Municipality of Durham, required for the creation of the Uxbridge Urban Provincial Park (UUPP), Duffins Creek Watershed (CFN 71328).

RECOMMENDATION:

WHEREAS TRCA is in receipt of a request from MECP for the conveyance of TRCA-owned lands located in the Township of Uxbridge, Regional Municipality of Durham, required for the creation of UUPP, Duffins Creek watershed;

AND WHEREAS it is in the best interest of TRCA in furthering its objectives as set out in Section 20 of the Conservation Authorities Act to cooperate with MECP in this instance;

THEREFORE LET IT BE RESOLVED THAT 39 parcels of TRCA-owned land containing 1545.66 hectares (3819.41 acres), more or less, of vacant land that will contribute to the expansion of the UUPP park boundary, as identified in Attachment #2 and Attachment #3, in the Township of Uxbridge, Regional Municipality of Durham, be conveyed to the MECP, subject to the following conditions;

THAT land transferred to the MECP must achieve a net ecological and community benefit, including additional investment and sustained maintenance by the Provincial government as part of the UUPP;

THAT consideration be the nominal sum of $2.00 and that all legal, survey and other costs to be paid by MECP;

THAT the MECP is to fully indemnify TRCA from any and all claims from injuries, damages or costs of any nature resulting in any way, either directly or indirectly, from this conveyance;

THAT MECP accept any additional reasonable terms and conditions as deemed appropriate by TRCA staff or its solicitor;

THAT should the Region of Durham or the Township of Uxbridge request lands and/or easement for municipal infrastructure projects, TRCA work to fulfill such requests subject to MECP concurrence;

AND THAT said conveyance is exempt from public consultation with the exception that notification to the Minister of the Environment, Conservation and Parks is required 90 days prior to the disposition in accordance with the requirements of Section 21 (2) of the Conservation Authorities Act, R.S.O. 1990, Chapter 27, as amended;

AND FURTHER THAT authorized TRCA officials be directed to take the necessary action to finalize the transaction, including obtaining any necessary approvals and the signing and execution of documents.

BACKGROUND

MECP has requested conveyance of TRCA-owned lands located in the Township of Uxbridge, Regional Municipality of Durham, required for the creation of UUPP, Duffins Creek Watershed.

At Board of Directors Meeting #8/23 held on October 20, 2023, Resolution #A169/23 was approved. This resolution directed staff to liaise with MECP staff regarding the UUPP. Further to RES #A169/23, since this direction was received, TRCA Property and Conservation Lands staff liaised with MECP, Parks Canada, Region of Durham, and Township of Uxbridge during several land assembly meetings to ensure consensus on the appropriate lands to be included in the creation of the UUPP.

RATIONALE

As of July 1, 2024, UUPP is Ontario's newest year-round day use provincial park to be established under the Provincial Parks and Conservation Reserves Act, 2006.

At the request of MECP and in consultation with municipal officials, TRCA is evaluating the opportunity to contribute to the boundary expansion of Ontario's first urban Provincial Park. TRCA and other levels of government currently have land holdings adjacent to or nearby the existing UUPP boundary which are ecologically important and which, if knit together to combine ownership and/or management, will leave a significant legacy in Ontario's Provincial Park system.

The various parcels of lands, operated as a Provincial Park with sufficient tax supported funds for operations and management, would provide and support ecological and trail connectivity, environmental education, and natural stewardship objectives. Being identified as part of a Provincial Park boundary under the Provincial Parks and Conservation Reserves Act will better protect these landholdings in the context of large-scall growth and development pressures facing the Greater Toronto Area and surrounding regions.

The park boundary expansion of the UUPP with TRCA lands in the Township of Uxbridge has the ability to sustain and increase the amount of ecologically important habitat that is placed into permanent conservation protection under the Provincial Parks and Conservation Reserves Act as well as provide trail and green space corridors and linkages across the local area which are critical to support fragile ecosystems and wildlife. The expansion also enables opportunities to connect trails and recreation systems across York, Durham, and Peel Regions, including Oak Ridges Moraine and river valley portions of the Greenbelt from the Trent River to the Niagara Escarpment, and north into the Kawartha and Haliburton area. The expansion will also compliment efforts of Parks Canada to connect the Rouge National Urban Park to important ecological and trail systems including those outlined for Durham Region in the TRCA Board of Directors endorsed Trail Strategy for the Greater Toronto Region. An expansion of the UUPP park boundary also provides a variety of sustainable and appropriate outdoor recreational opportunities for residents and park visitors and supports local tourism and regional economic growth.

Transfer of the TRCA lands will also alleviate operating pressures on TRCA, as all property and land management will become the responsibility

of the MECP once the lands are conveyed to the Province.

Consistent with the previous TRCA conveyances to and from the Province, TRCA may be requested to grant certain easements or nominal conveyance for infrastructure to municipalities prior to transfer of lands to MECP. Municipal parties may also identify several road improvements (road widening, daylight triangles, turning radius) which may be required in respect of municipal roads and other infrastructure within the vicinity of lands that may be conveyed. Prior to disposal of the parcels, the lands will be circulated internally through TRCA staff as well as externally with our Durham Region and Township of Uxbridge municipal partners to obtain any pertinent information and comments to inform the proposed transfer of lands.

Once all Board of Directors approvals, circulations, Ministerial notifications, and any other due diligence required by MECP has been completed, TRCA will be able to convey the lands as per the recommendations above and enable the expansion of the UUPP park boundary.

Relationship to TRCA's 2023-2034 Strategic Plan
This report supports the following Pillars and Outcomes set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 1 Environmental Protection and Hazard Management:

1.2 Leadership in greenspace conservation

Pillar 1 Environmental Protection and Hazard Management:

1.3 Maintain healthy and resilient watershed ecosystems in the face of a changing climate

Pillar 3 Community Prosperity:

3.1 Connect communities to nature and greenspace

FINANCIAL DETAILS
MECP will be responsible for all survey, legal and other costs associated with the completion of any land transfers.

Report prepared by: Brandon Hester, Senior Property Agent
Email: brandon.hester@trca.ca
For Information contact: Alexander Schuler, (437) 880-1950

Email: alexander.schuler@trca.ca
Date: September 3, 2024
Attachments: 3

Attachment 1: Correspondence from Ministry of Environment, Conservation and Parks
Attachment 2: Sketch illustrating the location of the subject lands
Attachment 3: Orthophoto illustrating the location of the subject lands

ONTARIO PARKS
Ontario Parks Operations Branch
300 Water Street, Floor 6 South
Peterborough, ON
K9J 3C7

August 29, 2024

Dear John MacKenzie,

On July 1, 2024, the Ministry of the Environment, Conservation and Parks (MECP) established Uxbridge Urban Provincial Park, Ontario's first urban provincial park, in the Township of Uxbridge. Over the past 18 months, we have been so pleased to have been working very closely with the Uxbridge Partners Network, including the Toronto and Region Conservation Authority (TRCA), to identify the full recreational and protection potential of a provincial park in the Uxbridge area and lands that could be proposed to be added to expand the park boundary in the future.

I would like to thank you and TRCA staff for the hard work and dedication between TRCA staff and Ontario Parks staff that has gone into this proposal since Spring 2023. Without this ongoing collaboration, we would not have been able to achieve as much as we have in just over a year. We are very excited to continue to work on this project with TRCA and look forward to working with you and your staff as conservation partners for many more years to come.

As a follow up to the September 20, 2023, letter from TRCA Board of Directors Chair to MECP, I am writing to you today to express interest in the further consideration of 39 specific parcels of land owned by the TRCA (Attachment). We have worked very closely with TRCA staff to review TRCA owned parcels and to identify those lands that would fit nicely with the vision of the newly established Uxbridge Urban Provincial Park to create natural trail connections in the Township of Uxbridge and for recommending for permanent protection under the *Provincial Parks and Conservation Reserves Act*.

If concurrence is provided by the TRCA Board of Directors, we will work with the Ministry of Infrastructure (MOI) and Infrastructure Ontario (IO) to complete due diligence work on behalf of the Crown and come to an agreement on the proposed acquisition details and associated acquisition costs that will be covered by MECP.

I would like to thank the TRCA for the continued support in the creation of Uxbridge Urban Provincial Park and the contributions and involvement on the Uxbridge Partners Network helping the Ontario government in protecting natural areas, promoting the importance of

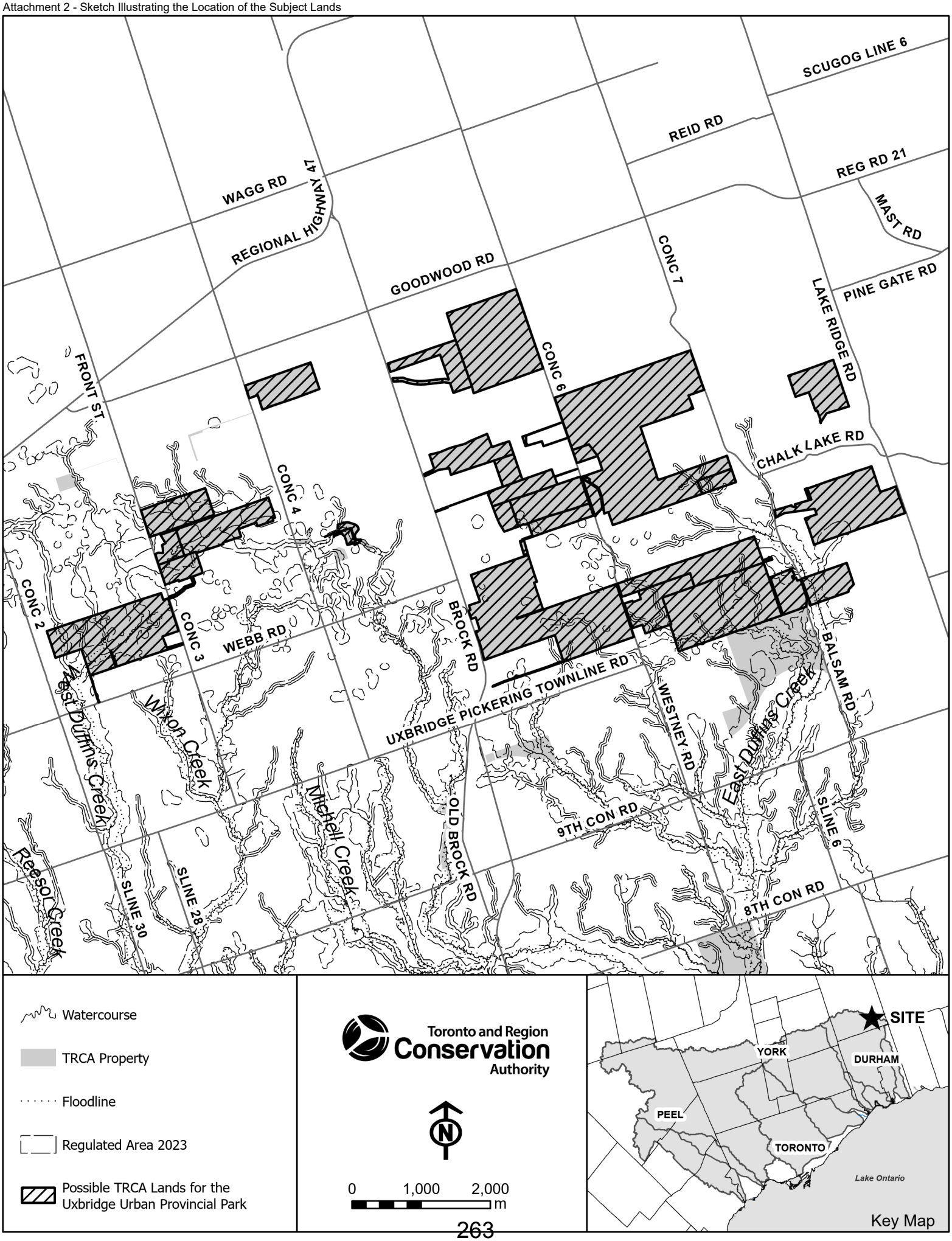
healthy, green spaces and increasing sustainable outdoor recreational opportunities for future generations to use and enjoy.

Yours truly,

Jason Travers
Director, Ontario Parks Operations Branch
Ministry of the Environment, Conservation and Parks

Cc Jason Yakelashek, Park Superintendent, Ontario Parks Operations Branch
Richard Ubbens, Director, Conservation Parks and Lands, TRCA
Alexander Schuler, Associate Director, Property & Asset Management, Legislative and Property Services, TRCA
Brandon Hester, Senior Property Agent, Property Services, Legislative and Property Services, TRCA
Deanna Cheriton, Manager, Conservation Lands, TRCA

Attachment 2 - Sketch Illustrating the Location of the Subject Lands



Attachment 3 - Orthophoto Illustrating the Location of the Subject Lands

Floodline

TRCA Property

Regulated Area 2023

Possible TRCA Lands for the Uxbridge Urban Provincial Park

Toronto and Region Conservation Authority

N

0 1,000 2,000 m

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Kathryn Lockyer, Director, Legislative and Property Services

RE: **2024 TRCA ASSET MANAGEMENT PLAN**

KEY ISSUE

Endorsement of the Asset Management Plan (AMP) for Toronto and Region Conservation Authority (TRCA).

RECOMMENDATION:

THAT the 2024 TRCA Asset Management Plan be endorsed.

BACKGROUND

TRCA owns and operates a substantial portfolio of assets across its jurisdiction. The tangible asset portfolio includes erosion protection works and flood control infrastructure; trails and park amenities; recreational and educational centers; staff administration offices; as well as tenanted homes and historic buildings. These assets protect life, property and public infrastructure, and contribute to quality of life within the jurisdiction of TRCA. Effective management of its tangible assets is paramount to TRCA's ability to support watershed management activities and future recreational and cultural activities for the benefit of the public.

Therefore, as part of the comprehensive Asset Management Program, TRCA outlined its Asset Management Policy (the "Policy") in 2017, and its Asset Management Strategy (Strategy) in 2019. The Policy defines expectations around the management of TRCA's physical assets, while the Strategy describes the principal approach and methods to be employed by TRCA to facilitate the effective and efficient management of assets, including lifecycle activities to be used to manage the risk to service delivery associated with asset creation, commissioning, operation, maintenance, and disposal.

Legislatively, the Province of Ontario enacted the Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O.Reg.

588/17). Under this regulation, Ontario municipalities are required to complete their asset management plans for core and non-core assets by July 1, 2024. O.Reg. 588/17 compliance is not mandatory for Conservation Authorities. However, changes to O. Reg. 686/21: Mandatory Programs and Services does require TRCA to develop and implement an asset management plan for its water and erosion infrastructure by December 31, 2024.

As a matter of alignment with its municipal partners and in keeping with O.Regs. 588/17 & 686/21, TRCA has prepared its Asset Management Plan listing core assets (Attachment 1: 2024 ASSET MANAGEMENT PLAN). Following the approval of RFP#10036270 at the Executive Committee Meeting of January 14, 2022, TRCA also implemented Enterprise Asset Management Software through its vendor PSD Citywide to consolidate assets in a database and to support effective asset management planning.

RATIONALE

Asset Management Plan (AMP)

TRCA's AMP is a document that describes the state of TRCA's assets and the approach to managing assets over their lifecycle to achieve desired levels of service. Through this document, TRCA has taken a first step towards outlining the relationship between infrastructure investments and its corresponding service levels. The AMP will serve as a guide to allow TRCA to make the best possible decisions regarding the construction, operation, maintenance, renewal, replacement, expansion, and disposal of all tangible capital (physical) assets.

The AMP is being completed in two phases with the first covering core assets within the following Service Areas:

- Flood Control Infrastructure
- Erosion Control Infrastructure
- Buildings (Administrative, Residential and Parks)
- Fleet Servies

This AMP also outlines a roadmap to the inclusion of Green Infrastructure in future iterations of the document along with IT assets.

The AMP include the following for each Service Area:

- State of Local Infrastructure
- Expected Levels of Service
- Asset Management Strategy
- Financing Strategy
- Plan Improvement and Monitoring

The assets within scope of the AMP are overall in Good to Fair condition, meaning that the infrastructure is adequate for now with some elements showing general signs of deterioration that require attention and a few elements exhibiting significant deficiencies.

These assets have a total replacement cost of **$788,667,910** in 2023 dollars, excluding land as outlined in the table below.

Service Area	Replacement Cost	Percentage of Total Replacement Cost
Flood Control Infrastructure,	$197,746,505	25%
Erosion Control Infrastructure	$ 376,469,600	48%
Administration Buildings	$ 87,635,430	11%
Residential Buildings	$ 33,360,876	4%
Parks Public Buildings	$76,177,498	10%
Fleet	$ 17,278,000	2%

Excluding the New Head Office, the cumulative 10-year capital cost to maintain the current service levels of assets within the Service Areas outlined in the AMP is approximately $23.4 million annually. Furthermore, based on the current levels of annual capital availability of $14.6 million, a

state of good repair (SOGR) shortfall of approximately $88.0 million could be expected over the next decade.

For a more fulsome outline of TRCA's infrastructure asset inventory, levels of service, and lifecycle management and financial strategy by service area, please refer to Attachment 1: 2024 ASSET MANAGEMENT PLAN, and Attachment 2: 2024 ASSET MANAGEMENT PLAN PRESENTATION.

Relationship to TRCA's 2023-2034 Strategic Plan
This report supports the following Pillars and Outcomes set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 1 Environmental Protection and Hazard Management:

1.1 Deliver provincially mandated services pertaining to flood and erosion hazards

Pillar 4 Service Excellence:

4.2 Provide and manage an efficient and adaptable organization

Pillar 4 Service Excellence:

4.3 Responsive relationships and a trusted brand with a reputation for excellence

Pillar 4 Service Excellence:

4.4 Transparent decision making and accountable results

FINANCIAL DETAILS

At this time, TRCA does not maintain a reserve for infrastructure assets. Based on staff recommendations, the utilization of reserve funds for ad-hoc emergent infrastructure capital needs are presented to the Board of Directors for approval, as required.

DETAILS OF WORK TO BE DONE

TRCA's first AMP forms a critical baseline to identify areas for improvement in lifecycle management and the need for long term investment of capital to maintain asset condition as well as service levels. Staff will do the following:

- Utilization of the Enterprise Asset Management Software to update the asset inventory database;

- Tracking operational expenses by asset category through the implementation of a work order system across Service Areas;
- Generate short and long-term capital plans through data-based analysis of asset condition and associated risk-based planning through the evaluation of the probability and consequences of asset failure;
- Provide the capital plans to the appropriate staff officials to help inform annual budget and funding discussions with participating municipalities, and prospective grant and funding applications with other levels of government; and,
- Outline strategies to minimize the funding deficit in Service Areas with greatest impact on public health and safety.

Future versions of the AMP will focus on the breadth of TRCA's Green Infrastructure. Minor updates to core assets will be completed on an ad-hoc basis, and major updates to Service Areas will follow a 5-year reporting cycle to the Board of Directors. Additionally, a State of Asset Management report will be prepared every 2 years for information to the Board, which will outline updates on TRCA's SOGR; levels of service; and financing strategy, among others.

Report prepared by: Almolah Sakir, Asset Management Consultant; Rutvik Pandya, Senior Manager, Asset Management
Email: Almolah.Sakir@trca.ca; **Rutvik.Pandya@trca.ca**
For Information contact: Alexander Schuler, (437) 880-1950
Email: Alexander.Schuler@trca.ca
Date: November 22, 2024
Attachments: 2

Attachment 1: 2024 ASSET MANAGEMENT PLAN
Attachment 2: 2024 ASSET MANAGEMENT PLAN PRESENTATION

ATTACHMENT 1 2024 ASSET MANAGEMENT PLAN

Asset Management Plan 2024

Prepared by TRCA

September 2024

TABLE OF CONTENTS

Section 1:

EXECUTIVE SUMMARY

SECTION 1: EXECUTIVE SUMMARY

Toronto and Region Conservation Authority (TRCA) is undertaking an Asset Management Program to manage our assets effectively and efficiently. This will allow the organization to deliver satisfactory levels of service to the public, as well as our municipal and provincial partners. The Asset Management Program will also helping us make informed decisions and to work with our funding partners to ensure the sustainability of our land and infrastructure to meet the demands of the future.

TRCA owns and operates a substantial portfolio of assets across different service areas. These assets are essential to the well-being of the community and form an integral part of TRCA's long-term financial and service delivery planning.

In keeping with the direction from the Ontario Minister of Infrastructure to municipalities via O. Reg 588/17, TRCA prepared an Asset Management Policy to outline the principles that will inform TRCA's Asset Management Program. These principles will ensure that asset management will be customer focused, regulatory driven, sustainable, and based on all lifecycle activities required to keep our infrastructure in a state of good repair.

TRCA has developed its first Asset Management Plan in alignment with O. Reg 588/17 to ensure that infrastructure assets are managed based on a decision model that maintains current levels of service in the most cost-effective manner.

Additionally, under Mandatory Programs and Services Ontario Regulation 686/21, conservation authorities are required to have Asset Management Plans in place for all water and erosion control infrastructure by December 31, 2024. This Asset Management Plan will also meet the requirements of this regulation.

With respect to the structure of this Asset Management Plan, Sections 1 through 5 outline the foundations of general asset management planning, whereas Sections 6 – 12 outline TRCA's application of those foundations.

1.1 Component of the Asset Management Plan (AMP)

TRCA's Asset Management Plan is a strategic document that describes the state of TRCA's assets and the approach to managing assets over their lifecycle to achieve desired levels of service. This asset management plan incorporates the following asset management principles:

- Aligning with the Provincial regulatory landscape, meeting the requirements of O. Reg 588/17 and 686/21.
- Understanding the current state of the infrastructure systems and demonstrating responsible management of the asset portfolio.
- Measuring and monitoring Level of Service (LOS) metrics.
- Ensuring TRCA's infrastructure system meets expectations and demonstrates that Levels of Service are being met in an effective and efficient manner:

- Demonstrating that due regard is being given to the long-term stewardship and sustainability of the asset base via full life cycle costing and project planning.
- Determining the optimal costs of the asset lifecycle activities required to ensure the infrastructure systems provide service levels that meet community expectations.
- Establishing a financial strategy to fund the expenditures that are required to complete the optimal lifecycle activities and communicate and justify funding requirements.
- Demonstrating a Risk-Based Perspective; TRCA will prepare funding requests, direct resources and expenditures, and raise priorities for funding partners to achieve the agreed service outcomes, at acceptable levels of risk.
- Outline opportunities to include green infrastructure in asset management planning in cooperation with municipalities and other TRCA partners, where applicable.

1.2 Structure of the Asset Management Plan

In alignment with O. Reg. 588/17, the Asset Management Plan (AMP) is structured to provide consistency to stakeholders who are engaged with the document. The following sections provide a general overview of the key components of an asset management plan as required by the regulation and illustrated in Figure 1.1.

Figure 1.1 - Asset Management Plan Structure

1.3 Program Areas and Service Overview

In this first version of the AMP, the aim is to take a broad view of TRCA's objectives, initiatives and strategies and interpret these for some of the major service areas, thereby showing the linkage between corporate targets and individual service area targets.

The AMP will be drafted in phases to include all directly owned assets by TRCA. The first phase in 2024 focuses on core infrastructure including Flood Control Infrastructure (dams and channels), Erosion Control Infrastructure, Buildings (Administration and Residential buildings), and Fleet. Subsequent phases of the AMP will include integration of Green Infrastructure as well as Information Technology assets.

The Program Areas and Services that are included in the scope of the AMP are listed in Figure 1.2.

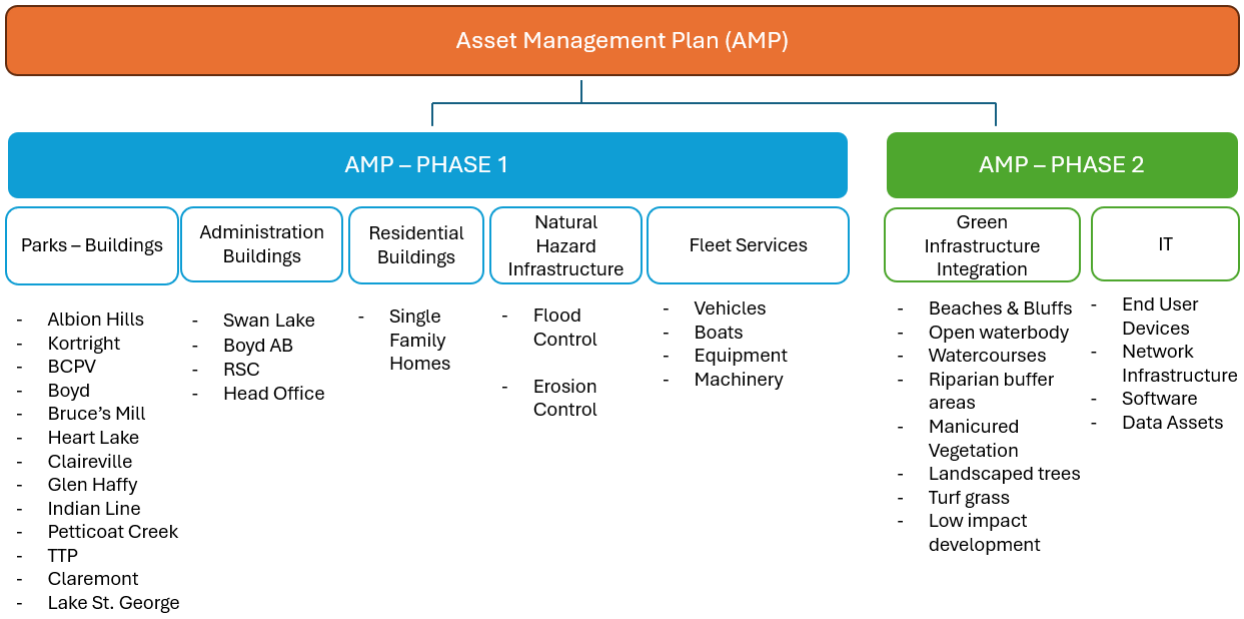


Figure 1.2 - Asset Management Plan Program Areas and Services

1.4 State of Local Infrastructure

TRCA has a tangible asset portfolio that includes land, erosion protection works and flood control infrastructure; trails and park amenities; recreational and educational centers; staff administration offices; vehicles and equipment, as well as tenanted homes and historic buildings. These assets protect life, property, and public infrastructure, and contribute to quality of life in the TRCA jurisdiction. The sizable portfolio of assets varies significantly in terms of their function, age, durability, and many other factors.

The assets considered as part of this AMP have a total replacement cost of **$788,667,910 i**n 2023 dollars. This value excludes land.

Table 1.1 – Asset Replacement Cost

Service Area	Replacement Cost	Percentage of Total Replacement Cost
Flood Control Infrastructure	$197,746,505	25%
Erosion Control Systems	$ 376,469,600	48%
Administration Buildings	$ 87,635,430	11%
Residential Buildings	$ 33,360,876	4%
Parks Public Facilities	$76,177,498	10%
Fleet Vehicles and Equipment	$ 17,278,000	2%
Total	**$788,667,910**	**100%**

As outlined below in Figures 1.3 and 1.4, the condition of the tangible capital assets is overall in **Good to Fair** condition meaning that the infrastructure is adequate with some elements showing general signs of deterioration that require attention and a few elements exhibiting significant deficiencies.

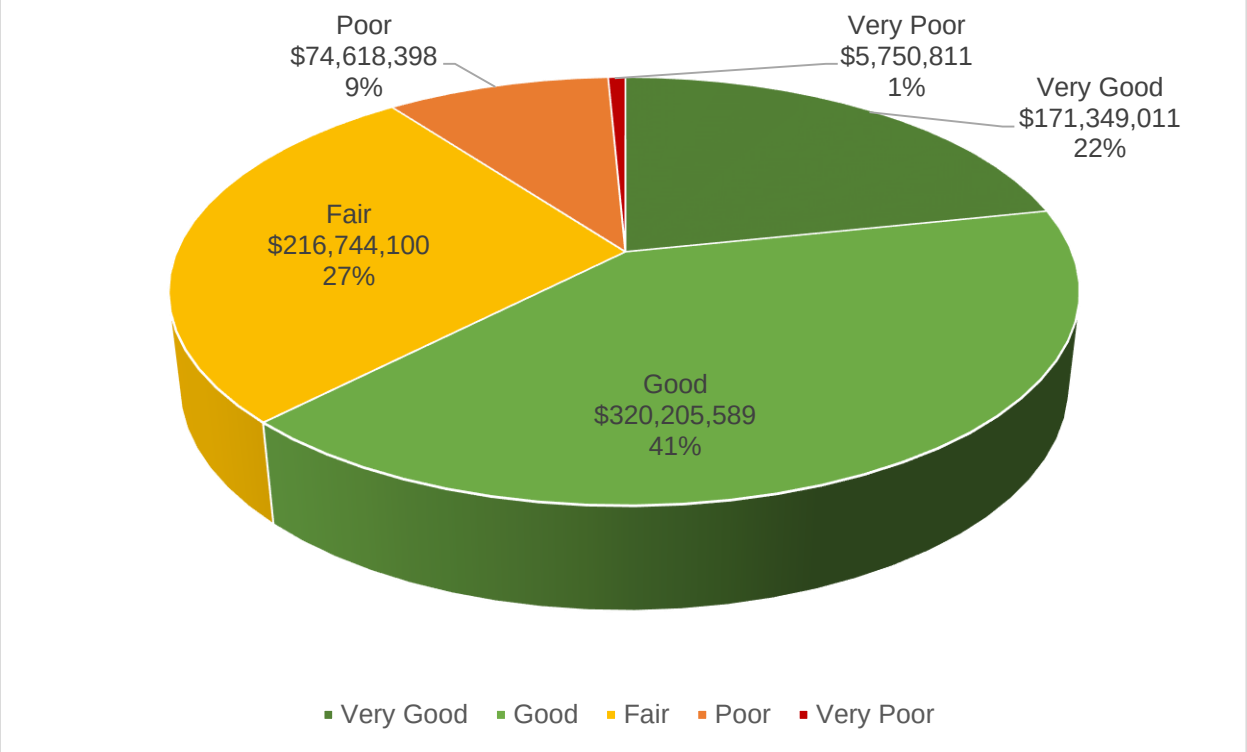


Figure 1.3 - Overall Assets Condition

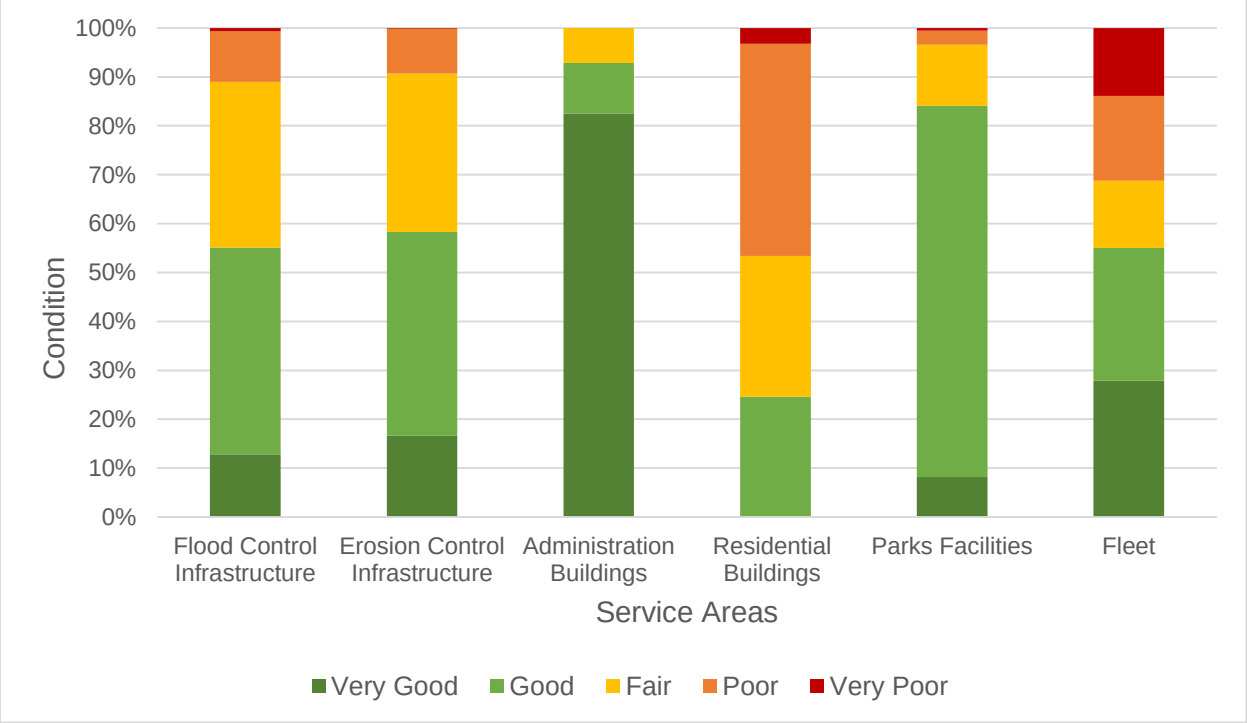


Figure 1.4 - Asset Condition by service area

1.5 Levels of Service

Levels of service (LOS) are vital determinants that impact asset management decisions. These statements define the desired service quality provided to customers and stakeholders, covering aspects like availability, reliability, safety, affordability, sustainability, responsiveness, and timeliness. To gauge performance and ensure compliance, performance indicators and targets are utilized to quantify expected services. Effective asset management necessitates formalizing LOS with performance metrics, targets, and associated timeframes while comprehending the associated costs.

The LOS at TRCA are summarized as below:

- **Corporate LOS**: Corporate statements that describe what services TRCA intends to deliver, and how it will align with customer expectations, operation efficiencies, and organizational goals and objectives.
- **Customer LOS**: Understanding TRCA's customers and other stakeholders and their expectations is a key input into LOS. Customer LOS are typically balanced against legislative requirements and the customer's ability/willingness to pay.
- **Technical LOS**: TRCA must translate customer expectations and legislative requirements into technical objectives, performance measures, and targets. Technical levels of service define what TRCA must do to deliver services that meet customer and legislated LOS.

The LOS measures include mandatory metrics that are prescribed by O. Reg. 588/17. The customer and technical performance measures include both the current performance, as well as the proposed future performance target. Each service area section also discusses any external trends or issues that may affect expected levels of service or our ability to meet them (e.g., new accessibility standards, climate change impacts).

1.6 Asset Management Strategy (AMS)

The asset management strategy outlines specific planned actions and activities that enable the assets to provide desired levels of service in a sustainable way, while managing risk and at the lowest lifecycle cost. The asset management strategy outlines a plan for renewal/rehab activities, maintenance activities, replacements, disposals, and expansion to service. The strategy should also address actions or policies that can lower costs or extend asset life.

Figure 1.5 - General AMS Model

Primarily funded through the capital budget, the range of lifecycle activities of a particular asset or groups of assets are outlined in Table 1.2.

Table 1.2 - Typical Asset Lifecycle Activities

Life Cycle Activity	Description
Maintenance (Operating)	Regularly scheduled inspection and maintenance activities
Rehabilitation (Capital)	Significant treatments designed to extend the life of the asset
Replacement (Capital)	Activities scheduled once an asset reaches end of useful life, and rehabilitation is no longer financially feasible
Disposal (Capital)	Activities associated with disposing of an asset once an asset reaches its useful life, or is otherwise no longer operationally required
Service Improvement / Asset Expansion (Capital)	Planned activities required to extend service to meet demands

1.7 Financing Strategy

TRCA utilizes a variety of funding streams such as municipal levies, grants and reserves for the operation

and maintenance of its assets. The financing strategy sets out the approach to ensuring that the appropriate funds are available to support the delivery of infrastructure services. The financing strategy is predicated on the current financial state of TRCA including revenues, operating and capital expenditures, reserves/reserve funds, and forecasted future commitments. The importance of the assets along with their significant capital and operating budget implications are intended to inform TRCA's long-term financial and service delivery planning.

For the period from 2012 - 2021, TRCA has invested an average of $10 million each year to maintain buildings, flood, and erosion control infrastructure. This amount is expected to balloon in future years as assets deteriorate and/or reach their useful life. On average, across its core service lines reported in this document, TRCA's annual capital requirement would be $23.40 million annually over the next 10 years.

Individual asset management plans for each of TRCA's asset types indicate that current levels of financial contributions for capital repair and replacement are not sufficient to fully fund the forecasted financial need for TRCA's flood and erosion control infrastructure and parks and education facilities over the next ten years.

Findings in the Asset Management Program will be leveraged to inform requests to funding partners as part of future budgets and grant requests to prioritize investments, targeting service areas with asset bases that contribute significantly to the infrastructure gap or service levels.

1.8 Plan Improvement and Monitoring

To ensure that TRCA's Asset Management Plan is relevant and useful, the following Asset Management Plan monitoring and review activities will be carried out:

- Formal adoption of TRCA Asset Management Plan by the Board of Directors.
- Review and formally adopt levels of service as these become available.
- Continued work to standardize asset management practices across the corporation, connecting technical asset lifecycle strategies to customer-focused performance measures that quantify the levels of service being provided to the community in each service area.
- Annual Review of the State of Asset Management Updates of the State of Local Infrastructure.
- Quality assurance audits of asset management information to ensure the integrity and cost effectiveness of data collected.
- Continued work to explore opportunities to address the infrastructure funding gap through various financial means.
- Integrating Green Infrastructure into the Asset Management Plan

Furthermore, the asset management plan will be adjusted to meet the requirements, including reporting requirements, of O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure (formerly, Bill 6: Infrastructure for Jobs and Prosperity Act, 2015), within the prescribed timelines.

To summarize, the key deliverables of this Asset Management Plan are as follows:

- Continue to align the Asset Management Plan with the Strategic Plan.
- Continue to advance the Asset Management Program through ongoing learnings and asset management best practices.
- Continue to improve coordinated efforts between and among departments and funding partners as asset management matures across the organization. Continuing to improve coordination efforts can advance asset management in cost-effective, and efficient ways.
- Explore opportunities to address the infrastructure funding gap through various financial strategies including updated budget requests to funding partners.
- Continually review and revise the TRCA unfunded priorities list and update the Board of Directors and municipal funding partners annually on this list.

Section 2:

INTRODUCTION

SECTION 2: ASSET MANAGEMENT AT THE TRCA

TRCA is a watershed management organization with responsibility for managing a broad range of physical assets across various service areas throughout TRCA's jurisdiction. These assets directly and indirectly support delivery of many programs across the service areas.

TRCA's aim with its assets is to maintain, renew, and enhance its asset portfolio through best asset management practices as well as ensure effective allocation of resources supporting the delivery of services aligned with our Strategic Plan, now and into the future. To ensure TRCA's assets are safe, structurally sound and fit-for-purpose to support our programs, the services they provide, and the delivery of our Strategic Plan to fulfill its obligations, TRCA must ensure that the assets integral to these programs are managed in a way that balances service levels, risk, and costs.

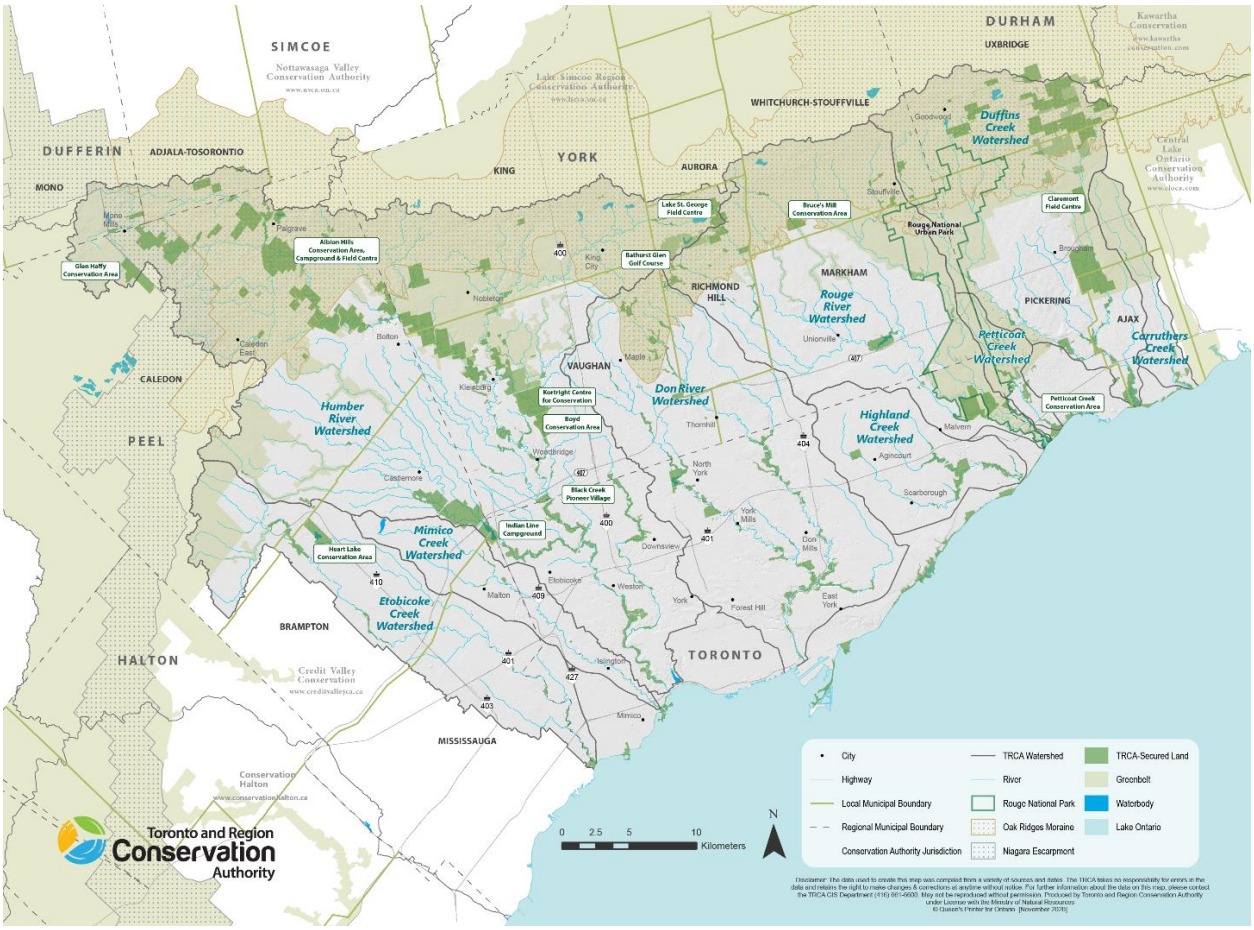


Figure 2.1 - TRCA's Jurisdiction

2.1 Reg 588/17 & Reg 686/21– Asset Management Plan Development

In 2015, the Ontario government introduced the Infrastructure for Jobs and Prosperity Act. Under this Act, the Ontario government also introduced O. Reg. 588/17 which requires that every municipality prepare an AMP in respect of its core municipal infrastructure assets by July 1, 2022. The Regulation further defines core municipal infrastructure assets to include roads, bridges, structural culverts, stormwater, water, and wastewater.

Although asset management planning is not a legislated requirement for conservation authorities, member municipalities are encouraging TRCA to undertake comprehensive asset management planning to support requests for municipal capital funding. The steps below outline key reporting requirements under O. Reg 588/17.

Phase 1: Update of asset management plan's core asset categories to add current level of service standard metrics, including the costs to maintain current levels of service.

Phase 2: Building upon Phase 1, update the asset management plan's remaining asset categories to include current level of service standard metrics, including the costs to maintain current levels of service.

Phase 3: Building upon Phases 1 and 2, update all of the asset management plan asset categories to include proposed levels of service, lifecycle management and a financial strategy.

In Section 5.1.2. of O. Reg. 686/21 Mandatory Programs and Services of the CA Act Regulation, it is outlined that conservation authorities with water and/or erosion control infrastructure are required to develop and implement an asset management plan by December 31, 2024. As the owner of flood and erosion control infrastructure, TRCA is legislatively required to have an Asset Management Plan in place for said infrastructure.

2.1.1 AMP Development Methodology

The first step in drafting this version of the AMP was to identify the current state of local infrastructure and identify gaps accordingly. All available 2023 data and information was used to predict the infrastructure gap over a 10-year window assuming current spending practices continue. TRCA intends to build upon this AMP through periodic updates of the individual departmental service area plans.

Figure 2.2 – AMP Development Methodology

2.1.2 Alignment with TRCA's Strategic Plans

TRCA 12-Year Strategic Plan sets out the directions we intend to pursue over the 12-year period from 2023 to 2034.

The aim of this Asset Management Plan (AMP) is to take a broad view of TRCA's objectives, initiatives, and strategies as they relate to the four strategic pillars (Figure 2.3) and interpret these for the various asset types across the organization, thereby, showing the linkage between corporate targets and individual service area targets.

Figure 2.3 - TRCA's Strategic Pillars

2.1.3 Relationship to Other TRCA Planning and Financial Documents

The AMP also integrates with other corporate planning documents such as:

- **TRCA Strategic Plan** – The AMP will use and influence policy directions for long-term growth and development as outlined in the TRCA 12 Year Strategic Plan.
- **Long Term Fiscal Impact Study** – The AMP will use and guide long-term financial forecasts.
- **Annual Budgets** – The AMP will identify construction, operation, maintenance, rehabilitation, replacement, expansion, and costs for disposal of assets, which will be considered in the development of annual capital and operating budgets.
- **Business Plans and Manuals** – The AMP is based on service levels, policies, and processes, as identified in various business plans and manuals; and will be used in the development of future business plans, performance measurements, and strategic decision making.

2.2 Supporting TRCA Goals Through Our Asset Management Program

TRCA Asset Management Program is designed to enable the management of our infrastructure assets in a way that connects our strategic community objectives to day-to-today decisions related to when, why and how we invest in our infrastructure systems.

There are five layers to our AMP which enable this connection as shown in Figure 2.4:

Figure 2.4 - Structure of the AMP

2.3 TRCA Asset Management Plan (AMP)

This AMP sets out how TRCA's infrastructure will be managed to ensure that it can provide the levels of service needed to support TRCA's key strategic outcomes, focusing on levels of service, lifecycle asset management planning, and the resulting long-term cash flow requirements.

This AMP meets the Ministry's guidelines for Development of AMP as follows:

1. Complies the key requirements as defined within the Ministry of Infrastructure's 'Guide for Municipal Asset Management Plans.'
2. Demonstrates that Levels of Service are being met in an effective and efficient manner.
3. Demonstrates that due regard is being given to the long-term stewardship and sustainability of the asset base to develop sustainable financial plans.
4. Demonstrates responsible management of the asset portfolio.
5. Communicates and justifies funding requirements.
6. Demonstrates the commitment that assets will be maintained in compliance with regulations.

2.3.1 Asset Management Plan Scope

This document outlines the first phase of TRCA's comprehensive AMP and includes all major infrastructure assets within the Flood Control as well as the Erosion Control Service Areas. These assets represent the largest category of amortized assets value and are also the largest area of risk. In addition to the Flood and Erosion control assets, this document includes TRCA's Buildings assets inclusive of rental, administration, education centers and parks buildings. These assets are key locations for the day-to-day operations for TRCA staff and for the delivery of our programs and services. Lastly, the first phase includes the asset management plan for TRCA's Fleet services.

Major service areas that are included within the current AMP:

The second phase of the AMP will include other TRCA assets with heavy emphasis on integration of Green Infrastructure and Information Technology assets.

Subsequent sections of this AMP will provide an overview of the following components from an asset management context:

- State of TRCA's Infrastructure
- Levels of Service
- Asset Management Strategy
- Financing Strategy
- Continuous Improvement

The above components will then be explored in detail for the Major Service Areas that are within the scope of this document.

2.4 Major Service Areas

Major service areas within scope of the first phase of the AMP comprise a significant portion of TRCA's asset portfolio, both in terms of size as well as the replacement value. The approach taken is a service-focused perspective to the Asset Management Program, and therefore the various infrastructure systems are described in terms of services and service areas rather than asset categories.

These Service Areas are outlined in table 2.1.

Table 2.1 – Assets Included in the Asset Management Plan

Service Area	Assets
 **Flood Control Infrastructure**	The flood control structures include a dam inventory that consists of 12 dams of which 5 provide flood protection. The other dams are historical mill and industrial dams. Also, there are 17 flood control structures that include channels, dikes, and flood walls.
 **Erosion Control Systems**	**Valley and River Structures** include Bank/Slope Treatments, Bed Protection structures, Buttresses, Channels, Retaining Walls, and Revetments
	Waterfront Structures include Beaches, Groynes, Headlands, Retaining Walls; and Revetments
 **Administration Buildings**	The New TRCA Head Office, Boyd Centre, Restoration Services Centre, Dave Barrow Centre for Conservation, Eastville Office
 **Residential Buildings**	Residential buildings include 50 rental homes.
 **Parks Facilities**	Parks Facilities include 173 vertical assets located throughout the 13 TRCA Conservation Parks, and Camps.
 **Fleet Vehicles and Equipment**	Fleet is generally comprised of Licensed Motor Vehicles, Highway Trailers, Off-Highway Equipment, Marine Vessels, and General Equipment. TRCA's Fleet includes 503 assets.

2.5 Future AMP updates and Timeframes

The AMP is a living document that will continue to reflect the evolution of asset management practices within TRCA.

TRCA has adopted a preliminary 10-year projection window for the first version of the AMP. Ideally the plan will reflect the asset lifecycles which vary from asset to asset, many lasting decades. Significant events may trigger the need for additional updates. Table 2.2 shows the targeted timelines for the review and, if needed, updates to the Asset Management Program.

Table 2.2 – Timeframes and Frequency for Review

Key Documents	Target Frequency (years)
Asset Management Policy	Every 5 Years
Asset Management Plan	2024- Every 5 Years
State of Asset Management	Every 2 Years

Section 3:

STATE OF LOCAL INFRASTRUCTURE

SECTION 3: STATE OF LOCAL INFRASTRUCTURE

The purpose of the State of Infrastructure is to provide a summary of the key physical attributes and current physical state of the asset portfolio; identifying asset types, accounting valuation and replacement cost valuation, asset age distribution and asset age as a proportion of expected useful life and asset condition.

This section seeks to establish an understanding of the current state of TRCA's infrastructure assets. The baseline snapshot of TRCA's assets will help decision-makers prioritize investments in the future; improving their ability to efficiently manage assets and deliver services. Also, it will lay the foundation for ongoing assessment, reporting, and benchmarking of our infrastructure assets.

The State of Local Infrastructure is a key building block for TRCA's future management of its infrastructure assets. The focus is on the "Major Service Areas", described generally as the infrastructure owned and internally managed by TRCA. This section is intended to provide the following information:

- Details of the Asset Inventory - What do we own?
- Valuation of the Asset Base (Replacement Value) - What is it worth?
- Condition of the Asset Base - What Condition is it in?
- What is their age and remaining service life?

This section includes summary information for all assets of the Major Service Areas within the scope of this AMP on:

- Asset Inventory
- Asset Valuation
- Asset Age Distribution and Average Expected Useful Life
- Asset Condition

State of Local Infrastructure Summary

The assets required to support TRCA’s services within the four Major Service Areas comprised of Flood Control Infrastructure, Erosion Control Infrastructure, TRCA Buildings (Corporate Administration, Residential, and Parks Facilities) and Fleet assets are estimated to cost **$788,667,910** to replace based on 2023 dollars.

68% of the assets within the scope of this Asset Management Plan are reported to be in **Fair to Good** condition.

Figure 3.1 provides a high-level overview of the inventory of various asset types, including replacement value, and the condition of TRCA's assets by service area. Detailed asset information under each service category can be found within the sections that follow.

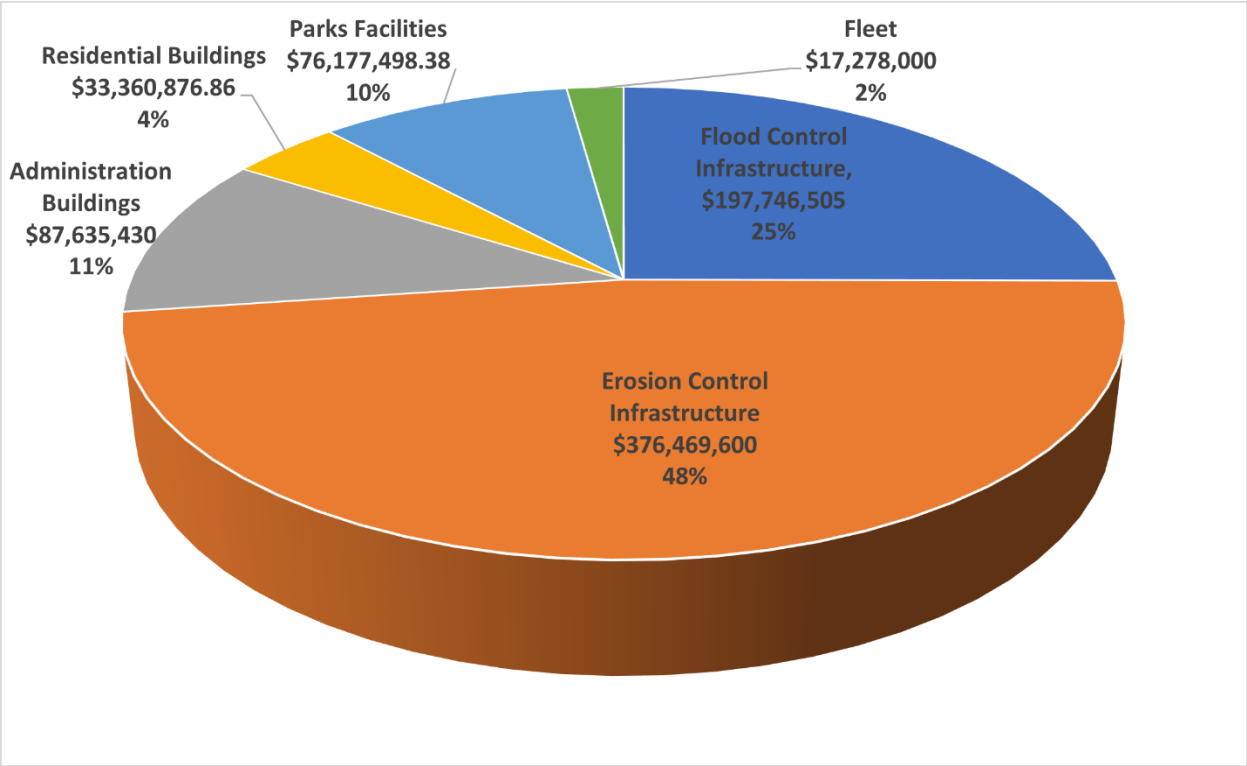


Figure 3.1- Total Replacement Value

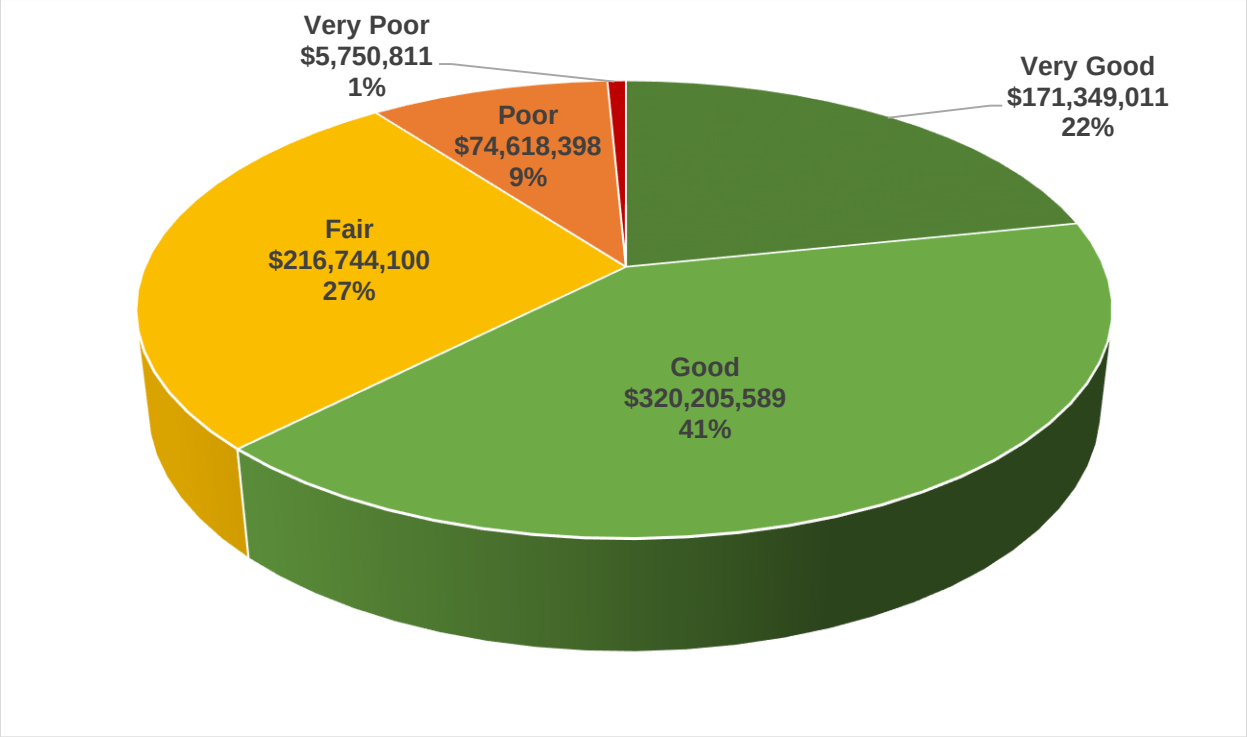


Figure 3.2 – Total Asset Condition

3.1 Asset Inventory and Valuation

The asset valuations within this AMP are based on data in TRCA's Tangible Capital Asset (TCA) system, which were a part of the PSAB financial reporting requirements. Under PSAB 3150, TRCA is required to summarize and present information regarding its TCA and amortization in financial statements based on historical costs. The valuation of assets differs based on their classification. Flood and Erosion control assets are valued using Non-Residential Building Construction Price Index data for Toronto as of Q1 1981. This index is updated quarterly by Stats Canada. However, to proactively manage assets, estimated replacement costs need to be calculated. The replacement value of Building assets is determined through a combination of periodic Building Condition Assessment (BCAs) as well as increases in the Non-Residential Building Construction Price Index data for Toronto. Fleet assets are relatively easier to value due to readily available acquisition costs and comparable market values of vehicles and equipment.

Not all of the assets are replaced (i.e., some are continually rehabilitated), but a replacement value estimate provides a foundational benchmark to understand the magnitude of the infrastructure that supports each service area. In the past, the starting point for replacement values was the historical cost of an asset, which was then increased by the rate of inflation since the asset was built or acquired. This approach provided a high-level estimate only.

This Asset Management Plan takes an engineering-based approach that considers cost factors in addition to inflation. For example, replacement values now incorporate current regulatory and design standards, as well as technological advances since the asset was originally put in place. Also, it typically costs significantly more to replace an asset than to put it in place for the first time because service has to be maintained during the replacement period.

Table 3.1 – Replacement Value Methods

Methodology	Description	Reliability
Recent Tenders	Recent tenders in neighboring municipalities and surrounding areas – cost to construct certain buildings, the acquisition cost of a new truck, vehicle or heavy equipment, cost to rehabilitate/replace roads and bridges.	Most Reliable
Local Price Index	Using local price indices for recently built or acquired assets to adjust to current value.	Reliable
Insurance Values	Insurance values, although often low, are a good benchmark or reasonability test.	Somewhat Reliable
Inflated Historical Costs	Historical cost inflated to current dollars. This approach is best used for assets recently acquired or for low value assets which represent a small share of a local government's total replacement value. A local government should look to move away from this approach and generate replacement costs based on the first two more credible methodologies.	Least Reliable

3.1.1 Detailed Asset Inventory and Replacement Values

TRCA applies a combination of the above-referenced valuation methodologies. A detailed summary of asset replacement cost by Major Service Areas is outlined in Tables 3.2– 3.7

Table 3.2 – Detailed Replacement Values – Flood Control Services

Service	Asset		Inventory	Unit	Total Replacement Value
Flood Control Infrastructure	Dams	Flood Control Dams	5	Each	$99,328,934
		Recreation Dams	7	Each	$7,213,544
	Channels	Flood Control Channels	11,520	Meters	$60,988,820
	Dike	Flood Control	3,570	Meters	$28,548,641
	Flood Wall	Flood Control Wall	2	Each	$504,538
	Hydrometric Equipment		102	Each	$1,162,028
TOTAL					**$197,746,505**

Table 3.3 – Detailed Replacement Values – Erosion Control Services

Service	Asset		Inventory	Unit (m^3)	Total Replacement Value
Erosion Control Services	Valley and River	Valley	51	121,030	$ 55,695,100
		Watercourse	202	176,200	$ 129,338,400
	Waterfront	Waterfront	29	3,361,670	$ 191,436,100
TOTAL					**$ 376,469,600**

Table 3.4 – Detailed Replacement Values – Administration Buildings

Service	Asset	Inventory	Unit	Total Replacement Value
Administration Buildings 	TRCA New Head Office	1	Each	$ 72,318,592
	TRCA Boyd Centre	3	Each	$ 5,802,032
	Restoration Services Centre	6	Each	$ 6,168,821
	Dave Barrow Centre for Conservation	2	Each	$3,345,985
TOTAL				**$ 87,635,430**

Table 3.5 – Detailed Replacement Values – Residential Building

Service	Asset	Inventory	Unit	Total Replacement Value
Residential Assets 	Residential Buildings	50	Each	$33,360,876.86
TOTAL				**$33,360,876.86**

Table 3.6 – Detailed Replacement Values – Parks Facilities

Service	Asset	Inventory	Unit	Total Replacement Value
Conservation Parks 	Parks Facilities	173	Each	$76,177,498.38
TOTAL				**$76,177,498.38**

Table 3.7 – Detailed Replacement Values – Fleet

Service	Asset	Inventory	Total Replacement Value
Fleet 	Agricultural Equipment	91	$ 2,381,000
	Construction Equipment	73	$ 2,712,000
	On-Highway Vehicles (Owned)	135	$ 343,000
	Highway Trailers	34	$ 1,608,000
	Off-Highway Equipment	90	$ 1,329,000
	Marine	38	$ 1,011,000
	Off-Road Vehicle	39	$ 7,511,000
	Snow and Ice Removal	41	$ 385,000
TOTAL		**502**	**$ 17,278,000**

3.2 Asset Age and Useful Life

TRCA primarily utilizes the assets' in-service date or year build data to determine the age of its assets. However, this information alone is not sufficient to build a holistic asset management plan. Therefore, it is important to understand how age has an impact on the useful life of the assets.

Expected Useful Life (EUL) of an asset is the period of time the asset is expected to provide service. The use of an asset ultimately impacts the life of an asset and its ability to provide service. Knowing the expected life of an asset and how much of it has already been used up gives some guidance on when it might fail and needs to be renewed. Asset Age by itself generally does not provide the same quality of information as assessing physical condition.

The distribution of average age and EUL for assets within the four Major Service Areas are outlined in Figure 3.3

In many cases, the service life of an asset can be extended well beyond the original expected useful life with proactive lifecycle management, but the cost of ownership generally increases as condition worsens and the frequency and costs of repairs increases. Understanding this concept of age-based asset performance and its interplay with asset condition and risk is key to addressing asset state of good repair (SOGR) backlog.

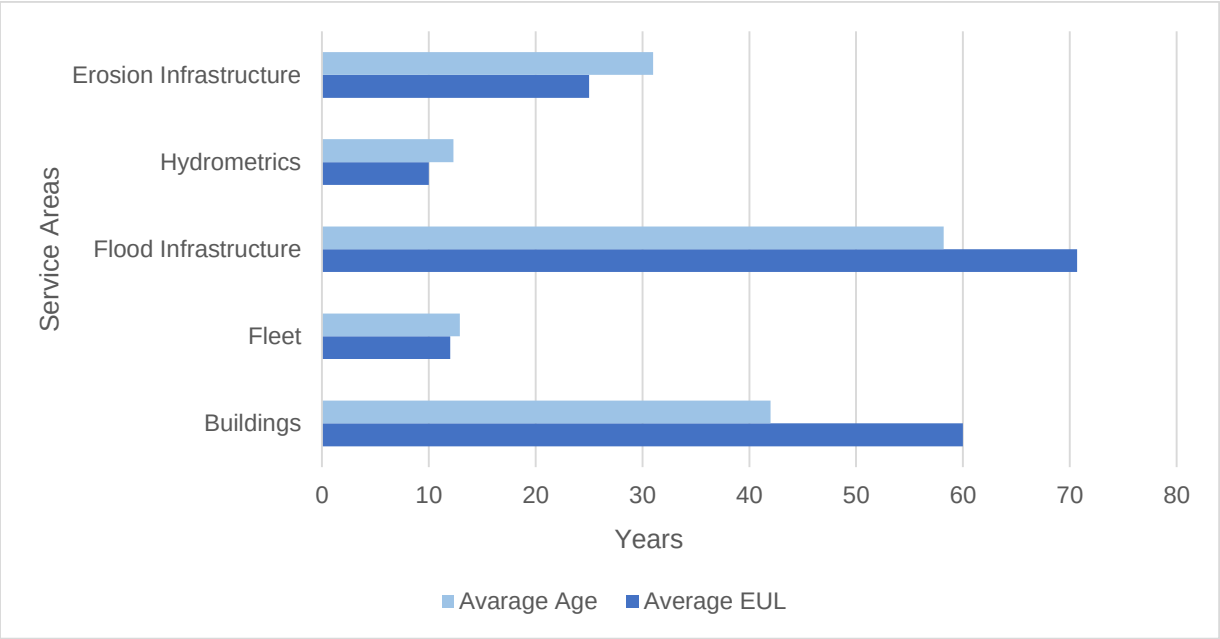


Figure 3.3 – Average Age and EUL in years

3.3 Asset Condition

Asset condition is simply a measure of the health of a particular asset accounting for its engineered service life and current level of use. An asset condition assessment provides an estimate of the remaining useful life of an asset. TRCA inspects assets on schedules that are appropriate to the asset group, with more critical assets such as bridges and structural culverts being inspected more frequently than others. In addition to routine inspections, TRCA also commissions periodic condition assessments reports for its long-lived assets. Depending on the asset class, TRCA utilizes various tools and methodologies to validate the condition of its assets. Some of these are listed below:

Table 3.8 - Facilities General Condition Grading System

Grade	Description	Condition (Criteria)
VG	Very Good	Very Good Condition - Only normal maintenance required
G	Good	Minor Defects only - Minor maintenance required (5%)
F	Fair	Maintenance Required to Return to Accepted Level of Service - Significant maintenance required (10% - 20%)
P	Poor	Requires Renewal - Significant renewal/upgrade required (20-40%)
VP	Very Poor	Asset unserviceable - Over 50% of asset requires replacement

- **Building Condition Index (BCI)** - The BCI is a standard facility management benchmark that is used to objectively assess the current and projected condition of a building asset.
- **Pavement Quality Index (PQI/ RQI)** - This is an industry standard benchmark used to indicate the general condition of linear assets such as pavements and roads based on a technical inspection of the number and types of distresses in a pavement. Pavement distress includes low ride quality, cracking, bleeding, bumps and sags, depressions, potholes, etc.
- **Bridge Condition Index (BCI**) - The BCI is a commonly used benchmark that rates the condition of a bridge by evaluating and rating its sub- components, such as foundations, piers, deck structure, sidewalks/curbs/median, abutments or side walls, railings, etc. All bridges with a span greater than 3 meters are inspected every two years as per the Provincial mandate.
- **Age and Expected Useful Life** - When no formal condition assessment was available, the Age of the asset and its Expected Useful Life (EUL) were used to estimate its current condition. The EUL is the average amount of time in years that an asset is estimated to function when installed new and assuming routine maintenance is practiced. The age-based condition was evaluated by comparing the age of the asset to its expected useful life, as per Table 3.9

Table 3.9 – Age and Expected Useful Life Condition Grading Standard

Condition	% of UL
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

TRCA uses an industry standard general condition grading system for the purpose of translating technical condition assessment data into easily understandable asset information. The grading scale is summarized in Table 3.10.

Table 3.10 – Five Point Infrastructure Rating Scale

1	Very Good	The infrastructure in the system is in generally good condition, typically new or recently rehabilitated. A few elements show signs of deterioration that require attention.
2	Good	The infrastructure in the system is in good condition; some elements show signs of deterioration that require attention. A few elements show signs of significant deficiencies
3	Fair	The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies.
4	Poor	The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
5	Very Poor	The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service.

10% of the assets in scope in this Asset Management Plan are rated **Poor to Very Poor** and carry an estimated replacement value of **$80,369,208.** These assets are good candidates for further investigation given the risk of impacting TRCA's ability to provide efficient and effective service to the community.

Section 4:

EXPECTED LEVELS OF SERVICE

SECTION 4: EXPECTED LEVELS OF SERVICE

Levels of service (LOS) are key business drivers that influence decisions about managing assets. By defining quantifiable LOS, decisions are made based on their impact on customers, the community, and the environment. This enables a clear line of sight to be established, from TRCA's strategic goals through to day-to-day asset management decision making. This section summarizes the Levels of Service and performance measures relevant to TRCA.

This Plan provides TRCA with a set of LOS measures which were developed through a series of consultation sessions with relevant TRCA staff.

4.1 Level of Service Framework

Level of Service (LOS) is a key business driver and influences all asset management decisions. LOS statements describe the outputs intended to deliver the service attributes such as quality, capacity, reliability, sustainability, availability, safety, timeliness, accessibility, and cost.

When setting the LOS measures, it is essential to define reasonable and realistic expectations, considering current and future needs over the lifecycle of the assets, as well as affordability, risk, timing, and external constraints.

TRCA employs a service delivery approach to define the various LOS. This involves identifying the levels of service to customers and other stakeholders, and quantifying the funds required to maintain this level of service.

LOS are linked at three levels within TRCA as shown in Figure 4.1:

1. **Corporate LOS:** considered to be the overarching principle to ensure that levels of service are in alignment with the organization's strategic goals and objectives.
2. **Customer LOS:** measures how the community receives the service and whether the organization provides community value.
3. **Asset (or Technical) LOS**: Defines the technical requirements needed to achieve service objectives. using metrics that describe what the organization provides.

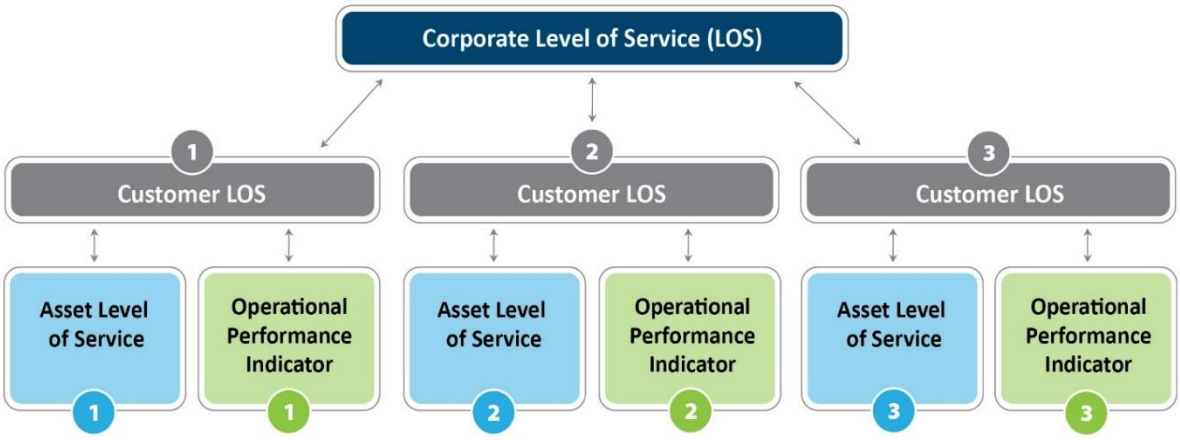


Figure 4.1 – Levels of Service Framework

It is important to define and quantify the Levels of Service within each service area, as these become the driver for the identification of asset needs and the basis for investment decisions.

Levels of Service are linked at three levels within TRCA—corporate, customer and asset levels to provide a clear line-of-sight between corporate objectives and asset-focused objectives, as shown in Figure 4.2.

Figure 4.2 – Alignment of Levels of Service to Corporate Strategy

4.2 Corporate Levels of Service

In alignment with the vision of achieving safe and resilient communities, TRCA's Corporate LOS are centered around the four (4) strategic pillars:

1. Environmental Protection and Hazard Management - Mitigating hazard risks to communities and protecting the natural environment.
2. Knowledge Economy - Contributing to environmental targets through knowledge advancement.
3. Community Prosperity - Building communities to drive local action and improve wellbeing.
4. Service Excellence - Customer service excellence for efficient service delivery to adapt to a changing environment.

Within each of the four strategic pillars, TRCA has identified specific actionable objectives. Examples of these are:

- Deliver provincially mandated services pertaining to natural hazards including flood and erosion.
- Maintain healthy and resilient watershed ecosystems.
- Optimize the total life cycle and the associated cost of assets.
- Maintain high quality levels of client and customer service.
- Seek opportunities to incorporate green technology.

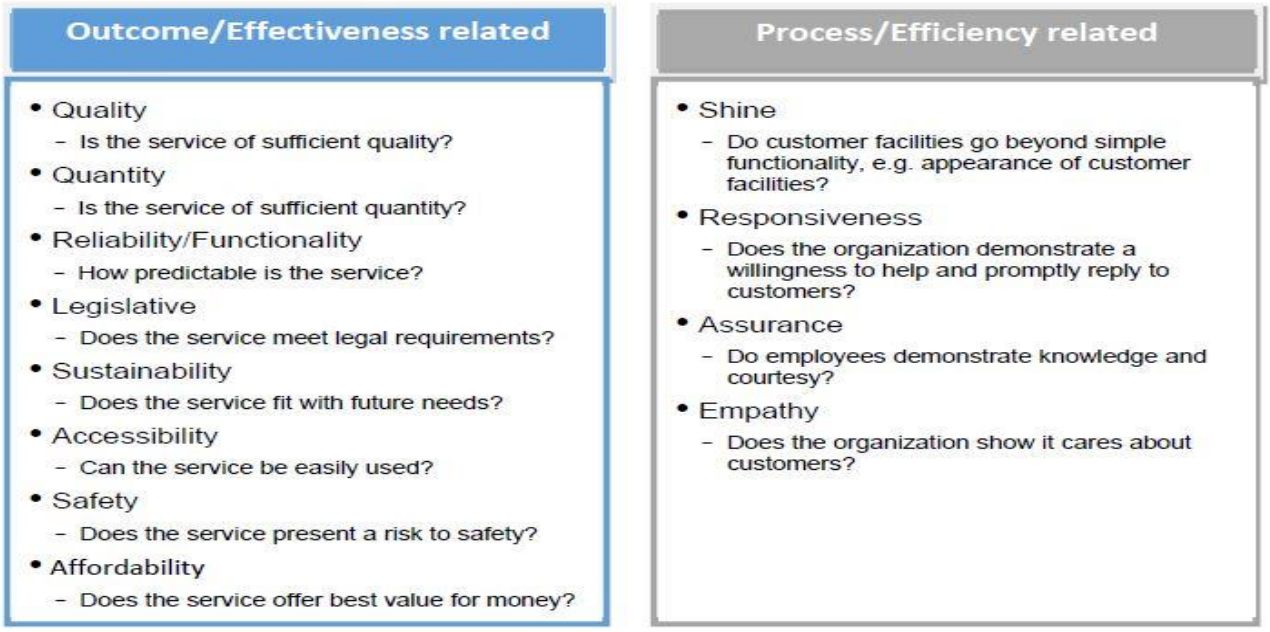
The objectives within the Corporate LOS factor into the organization's asset management policy cascading down to the asset management strategy and finally to individual asset management plans for each of the Major Service Areas.

4.3 Customer Levels of Service

Customer Levels of Service describe how a service is expected to be received by the customer and sets non-technical service targets. Customer LOS should be defined as statements of desired performance outcomes that are:

- High priority to customers, or
- Of importance to the integrity of the environment, or
- Required by regulators/legislation.

The LOS should be within the control of TRCA and its organizational processes and be clearly linked to activities undertaken by the organization. Key questions asked while developing the Customer LOS are outlined in the list below.



4.4 Asset (Technical) Levels of Service

Asset/Technical Levels of Service are specific and measurable. The Technical LOS defines what TRCA must accomplish to deliver services that meet customer and legislated LOS.

Given the unique nature of TRCA's assets, legislated requirements are the key drivers within certain asset classes e.g., flood and erosion control infrastructure as well as fleet services. On the other hand, Technical LOS for building and other public facing assets have customer and stakeholder requirements that are more dynamic i.e., seasonality.

The physical health and suitability of the assets is measured via the Asset Condition and Performance Levels. These levels are also factored in when establishing Technical Levels of Service for a given group of assets within a service category.

Capital projects to improve the condition of the assets generally involve major rehabilitation or replacement of the assets. Capital projects to improve the performance of an asset or system can include replacing and upgrading an old asset with more modern technology, reconfiguring assets, or adding additional assets.

Typically, Technical LOS for an asset type are categorized as:

Condition - the physical "health" of the assets.

- Measures on the condition of the asset e.g., pipe breaks, pavement wear, roof leaks, foundation cracks, equipment malfunctions and failures.
- Can be forecasted using lifecycle models.
- Capital projects to improve the condition of the assets generally involve major rehabilitation or replacement of the assets.

Performance - the "suitability" of the assets.

- Assess the assets' or asset systems' ability to provide sufficient quality and quantity of service and/or have adequate capacity to reasonably protect against external risks to services.
- Examples of performance levels of service would be the ability of HVAC systems to operate within a target range, fleet assets meeting/exceeding legislated performance targets.
- Capital projects to improve the performance of an asset or system can include replacing and upgrading an old asset with more modern technology, reconfiguring assets, or adding additional assets to the system.

4.5 Performance Measures

Performance management is an integral part of the overall Asset Management Program; more specifically under TRCA's defined levels of service for various asset categories and systems. This process involves identifying goals, measuring progress, reporting the results in a meaningful way, and using results to drive improvement.

Performance measures are segmented into two broad categories:

Current Performance – These are the actual performance metrics as derived from previous years' performance measured by staff or determined using data held in corporate information systems. E.g., number of maintenance service requests, downtime for fleet assets, effectiveness of flood or erosion mitigation measures etc.

Desired Performance - These measures are the targets that should be set as part of the 3-10-year business and asset management planning processes and should be based upon a realistic estimate of how performance can be maintained or improved over the current baseline, considering the availability of funding and the associated capital and operational investment strategies that can be implemented over this period.

4.6 Service Areas Levels of Service

Levels of service (LOS) tables for each of the service areas (Flood Control, Erosion Control, Buildings, Fleet) are developed and maintained through discussions with staff that support the provision of the respective service area.

Major components of the tables are identifying customer values, corporate LOS objectives, customer focused performance measures, and technical focused performance measures.

The LOS measures include mandatory metrics that are prescribed by O. Reg. 588/17. The customer and technical performance measures include both the current performance, as well as a proposed future performance target. Each service area section also discusses any external trends or issues that may affect expected levels of service or our ability to meet them (e.g., new accessibility standards, climate change impacts).

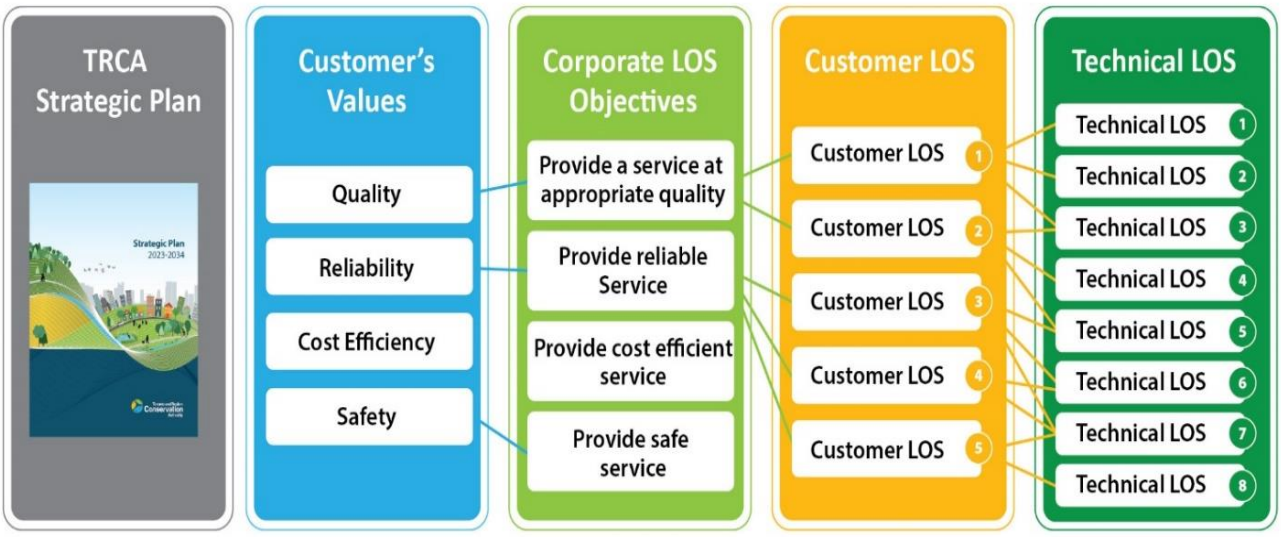


Figure 4.3 - Level of Service Hierarchy by service area

4.7 Internal and External Trends

Many internal and external factors and trends have the potential to impact on TRCA's ability to continue to deliver its programs and services. Table 4.1 below outlines factors that may influence TRCA's Asset Management Program.

Internal benchmarking allows TRCA to evaluate performance over time in response to internal pressures. External benchmarking allows TRCA to benchmark its performance against similar organizations to help identify best practices and position itself amongst its peers.

It is crucial that TRCA's performance measures and performance planning within the asset management program be dynamic in order to align to internal and external trends.

Table 4.1- External and Internal Trends

Key Trends	Potential Impact
New Regulations / Upcoming Regulations	New legislation (e.g., emissions standards or further accessibility requirements) could result in the existing assets not being able to meet the new LOS. To address this, TRCA has established processes to monitor when and how future legislation can impact the asset base and, where possible, new assets are 'future proofed' where their design and construction considers to the extent possible the potential impact of any new legislation.
Complexity in growth forecasts	The timing and scale of development across TRCA, which can sometimes be difficult to predict or plan, varies in accordance with market demands and TRCA's own approval processes. This has the potential to impact on both financial and operational performance indicators.
Expectations	Societal and political influences will continue to shape TRCA's strategy and priorities. Social trends have the potential to impact LOS delivered by the assets, as people increasingly want more information and more dialogue, and this could be regarding the type and quality of service delivery by TRCA. Also, residents will likely expect to use a broader range of communication approaches, including social media, to connect TRCA and its residents regarding service levels.
Aging infrastructure	The flood control system and infrastructure is relatively old. This is a known trend that will continue to burden TRCA and impact on its ability to provide high levels of service. While TRCA does have relatively young buildings, TRCA does still have several older assets in its portfolio. As these assets deteriorate, there is a risk LOS will decline. However, the adoption of asset management practices by TRCA will enable cost-effective and timely maintenance and rehabilitation activities to mitigate this risk.

Key Trends	Potential Impact
Rapidly changing technology	Rapidly changing technology in a changing and uncertain macro environment challenges how quickly we adapt in the way we connect with residents and deliver services.
Funding and sustainability	Refer to the Finance Strategy section, for potential impacts related to these trends.
Future Pandemics or Diseases impact and response	Future pandemics or diseases can have multi-year implications on how TRCA operates and maintains assets. These events may also cause permanent impacts on asset design and delivery of capital programs.
Environmental changes / Climate change	Full impacts of climate change that have already affected the asset base (i.e., frequency of storm-related events etc.) are not fully known at this time. Increased occurrences of flooding can occur as the assets increasingly struggle to cope with higher intensity storm events, and this will impact key stormwater ponds, the stormwater network, flood monitoring network gauges and potentially other related assets. TRCA must fully assess a range of climate change scenarios and embark on a comprehensive development of a Risk Management Strategy and have the capabilities to make the management of TRCA assets more sustainable.

Section 5:

ASSET MANAGEMENT STRATEGY

SECTION 5: ASSET MANAGEMENT STRATEGY

5.1 Purpose of the Asset Management Strategy (AMS)

The Asset Management Strategy (AMS) is the basis for delivery of TRCA's Asset Management Policy, the efficient compliance with business needs, achievement of corporate goals and objectives. Also, the Asset Management Strategy sets a framework to guide the development, implementation, and maintenance of individual Asset Management Plans. Each service area covered in the AMP undertakes an individual approach to asset condition assessment and the identification and prioritization of asset renewal needs.

Figure 5.1 below shows how the strategy and planning are a component of the whole AMP.

Figure 5.1 - Strategy and Planning in Asset Management Plans

The focus of this document is on the specific actions to be undertaken by TRCA to develop a structured set of actions aimed at best Asset Management practices.

The purpose of this Strategy is to:

- Develop and sustain asset management practices and ensure that these practices are applied consistently across the organization.
- Ensure a comprehensive approach to asset management that recognizes the functionality and performance of assets through time and plans for the eventual replacement of existing assets.
- Outline long-term goals, processes, and steps TRCA will take to deliver optimized lifecycle costing and priority setting.
- Establish a work plan and schedule for the preparation of and updates to Asset Management Plans.
- Assess and prioritize maintenance and operation's needs, and investment therein, based on criticality and reliability.
- Define routine preventative maintenance activities to ensure the preservation of existing assets.
- Ensure operational and maintenance requirements are considered when planning new infrastructure.
- Establish a process for reporting on the State of Good Repair.

This Asset Management Strategy considers asset and non-infrastructure solutions. These solutions can be used to identify renewal, growth and improvement, maintenance projects, and optimizing the maintenance of TRCA's infrastructure while continuing to meet target LOS.

Components of Asset Management Strategies

An effective asset management strategy requires knowledge of the condition of the assets, the performance of the assets as compared to desired levels of service (LOS) and the associated costs to maintain, rehabilitate, replace, dispose, and expand the asset systems and components. Required work can then be prioritized based on the relative risks of the assets.

5.2 Data and Information Management

Organizations rely on data and information as key enablers in undertaking activities for Strategy and Planning. Access to accurate asset data is the first step in successful strategic asset management practice, and capturing this information in an objective, repeatable manner is essential.

TRCA is currently in the process of implementing an Enterprise Asset Management system (EAM) that supports TRCA asset management plans, enhances the monitoring, reporting and capital planning functions, and ensures all asset data is captured accurately and stored in a central location.

The EAM database will provide the following:

- Decision makers will be able to rely on verified information as a base for their decisions.
- Provide readily available, reliable information for effective management of the assets.
- Users will have readily available, user-friendly access to information including the ability to identify trends.
- Proper maintenance of an organization's asset infrastructure to assist in ensuring safety, complying with regulations, and achieving the financial and operational targets that are established.

The Enterprise asset management software includes the Maintenance Management System application that connects with the inventory management system. Maintenance manager and Asset Manager Modules are used to maintain facilities and infrastructure. These modules integrate with a GIS ESRI Arc system. Proper maintenance of an organization's asset infrastructure is a key to ensuring safety, complying with regulations, and achieving the financial and operational targets that are established. This software enables the organization to create work orders, schedule resources and track costs associated with asset maintenance and repair. In addition, employees can create an online self-service request to report or request maintenance, repairs, renovations, and other service activities.

Also, mobile-friendly applications will improve our service delivery for daily maintenance work involving our vendors, clients, and staff, while improving connectivity, communication, and collaboration, and reducing data duplication and error.

5.3 Risk Management

Inherent in delivering a wide range of services to the community, TRCA is exposed to a variety of internal and external factors that add uncertainty to the successful delivery of services. Uncertainties that influence the organization’s ability to achieve its objectives are termed “risks” and have the potential to significantly affect TRCA’s ability to deliver services in an effective and efficient manner.

5.3.1 Risk Management Process

Risk management assists in managing risks effectively through the application of the risk management process at varying levels and within specific contexts of the organization. Furthermore, it also ensures that information about risk derived from the risk management process is adequately reported and used as a basis for decision making and accountability at all relevant organizational levels.

Figure 5.2 outlines the components of the Risk Management Process and strategy.

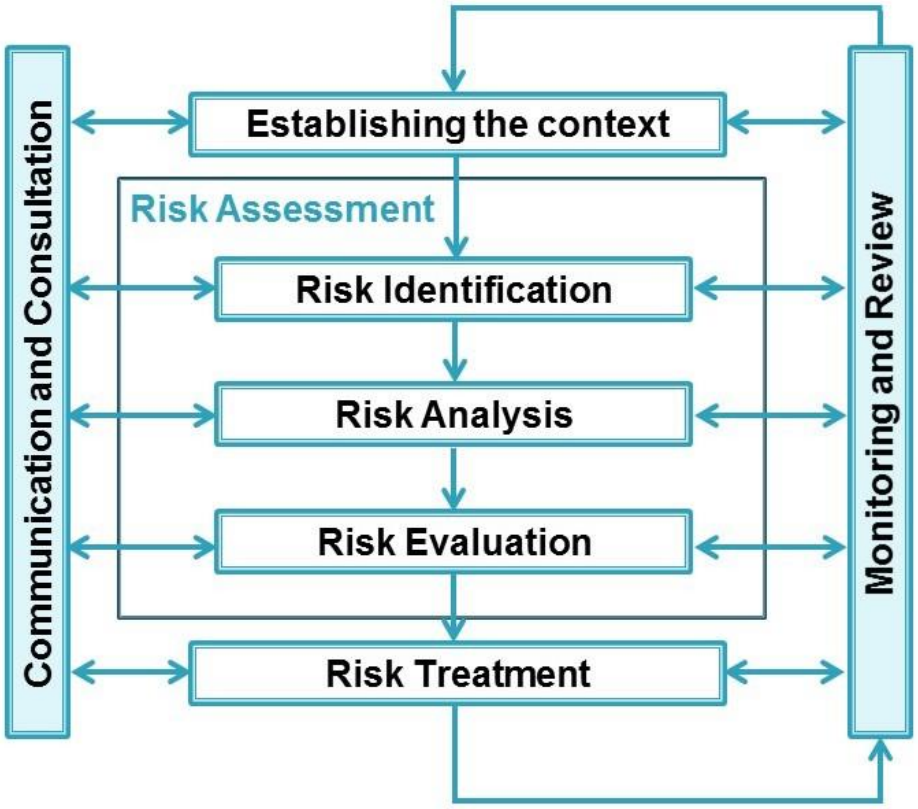


Figure 5.2 - Risk Management Process

5.3.2 Risk Assessment

A risk assessment evaluates how likely an asset is to fail, and what the impact of that failure would be for the community. Risk assessment includes risk identification, risk analysis and risk evaluation.

Risk Identification

Risk identification is the process of identifying as many sources of risk, areas of impact, events their causes and their potential impacts as possible. The aim is to identify risks that are under and outside of the organization's control as well as internal and external to the organization across several categories including **legal/regulatory, operational, financial, and strategic risks.**

Risk Analysis

Risk analysis involves consideration of the causes and sources of risk, their positive and negative consequences, and the likelihood that those consequences can occur. Combined they can provide a quantifiable measure of each risk faced by TRCA.

The framework states that all risks are a result of the likelihood and consequence of risk related events.

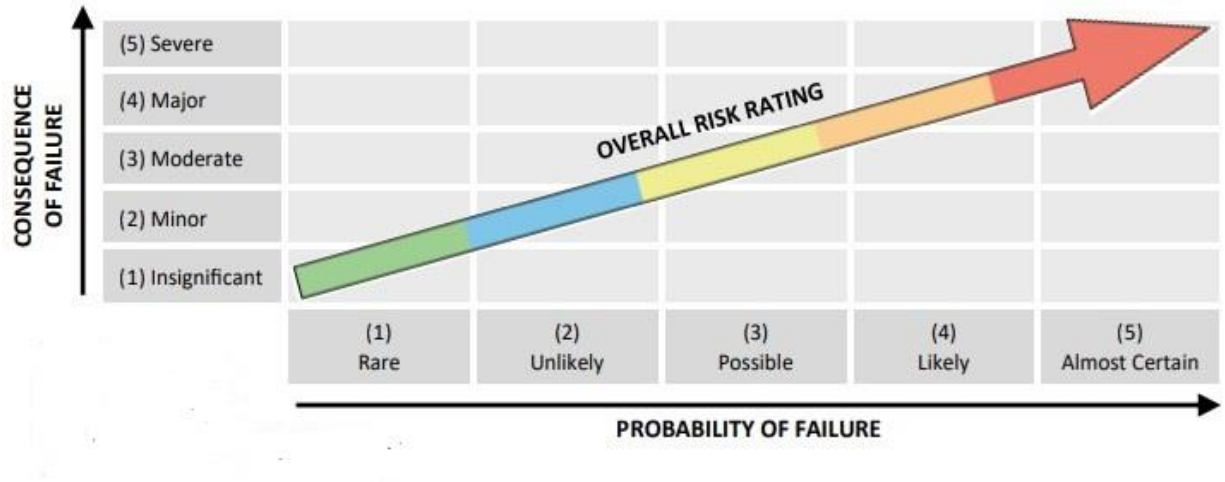


Figure 5.3 - Risk Analysis

The probability of failure (POF) - Likelihood

This represents the likelihood that an asset will not achieve the desired level of service or will not be able to fulfill a certain need. If the condition of an asset deteriorates, the probability of failure will increase. However, even assets with a high condition score can be at risk of failing to meet community needs if they no longer meet regulatory requirements or are inadequate to meet changing demand. The factors used to estimate the probability of failure vary by asset class, and may include things like construction material, condition assessments and age. The likelihood of failure will be determined on an asset-by-asset basis based on a qualitative score from 1 to 5 where 5 represents the highest likelihood of failure.

The consequence of failure (COF) – Consequence

This represents the outcome of an event affecting the levels of service. The consequence can be expressed from both a qualitative and or quantitative perspective. Similar to the likelihood of failure, the consequence will be determined on an asset-by-asset basis. An asset is assigned a consequence based on a 1 to 5 scale where 5 represents the highest consequence if an asset is considered to fail. The consequence of failure is determined based on the degree to which a risk event would impact levels of service based on the following criteria:

- **Health and Safety**: associated with the magnitude or seriousness of injuries that can occur under a certain risk event. This would correspond to the legal and regulatory category of the risk.
- **Reputation/Social**: refers to the perception of the public of the service being provided by the asset. This would correspond to the strategic category of the risk where factors such as shifts in demographic or social awareness would affect the consequence.
- **Service**: considers the level of disruption if an asset does not provide the target level of service. This would correspond to the operational category of the risk where factors such as changes to the level of service would affect the consequences.

- **Economic**: refers to the financial/economic impact if an asset does not provide the target level of service. This would correspond to the financial category of the risk where factors such as current economic or market conditions are the drivers of the consequence.
- **Environmental**: considers the impact on the natural environment, and the timeframe in which the impact can be reversed. This is related to both legal and regulatory compliance and the strategic categories of the risk with a key driver of risk increase by climate change.

Risk Evaluation

Risk evaluation involves comparing the level of risk found during the analysis process with risk criteria established when the context was considered. Based on this comparison, the need for treatment can be considered. After establishing the parameters associated with likelihood and consequence, the information can be used to generate a quantitative assessment based on the following formula:

Likelihood x Consequence = Risk Rating

The risk categories, and associated color coding, are defined as follows:

- **Insignificant - Very low (Green)** – No actions required. A very low risk has a low probability of risk occurring, and a low impact to service delivery. This risk can be responded to by maintaining routine procedures, and planning renewals in the longer term.
- **Low (Blue)** – May be acceptable but monitoring of assets may be required. A low risk has a low-moderate probability of occurring, and low-moderate impact to service delivery. This risk can be responded to by establishing a monitoring program and planning renewals in the intermediate to long term.
- **Moderate (Yellow)** – Requires some consideration by management with necessary risk management, and monitoring adopted as needed. A moderate risk has a moderate probability of occurring, and a moderate impact to service delivery. This risk can be responded to by establishing a monitoring program, and planning renewals in the intermediate term.
- **High (Orange)** – Requires consideration by management, risk management and monitoring are required. A high risk has a moderate-high probability of occurring, and moderate high impact to service delivery. This risk can be responded to by establishing a monitoring program with frequent risk assessments, and planning renewals in the intermediate to near term. Consideration should also be made for additional preventative or correction actions.
- **Extreme - Very high (Red)** – Requires extensive management input, risk mitigation to reduce to an acceptable level is essential. A very high risk has a high probability of occurring, and high impact to service delivery. This risk can be responded to by establishing a monitoring program with frequent risk assessments, and planning renewals in the near term. Consideration should also be made for additional preventative or correction action.

The application of the risk model allows TRCA to prioritize resources, ensure vital services are available, streamline inspection programs, optimize operations and maintenance programs; and prioritize and optimize capital budget program delivery and above all minimize risk.

Table 5.1 – Example of Risk Assessment Matrix for TRCA assets

Risk Treatment

Identifying what risk treatments are required to manage/reduce the risk of assets failing to provide desired levels of service. Different risk treatments will have varying effects on levels of service, and it is important to ensure that the optimal risk treatments are utilized.

It also becomes necessary to identify the costs of the lifecycle activities. Factors such as funding availability and affordability for undertaking mitigation actions will need to optimize which lifecycle activities will have the greatest net positive impact to the organization. Therefore, a cost-benefit analysis will need to consider these factors to help prioritize lifecycle activities that are feasible to undertake.

Monitoring and Review Processes

Encompasses all aspects of the risk management process and involves regular checking, supervising, critically observing or determining the status to identify the change from the performance level required or expected.

The objective of risk management is to assess which risks pose unacceptable conditions to the organization and advance plans to address them. TRCA primarily manages the risks around infrastructure – which include poor performance, high costs and premature failure – through maintenance and rehabilitation activities based on assessment of assets' age and/or condition and performance testing.

Figure 5.5 – Risk Treatment Framework

5.4 Asset Life Cycle Management

Most of TRCA's physical assets are long-lived assets having service lives lasting several decades. As a result, infrastructure-related decisions have a lasting impact. These decisions need to be made looking at the lifecycle or whole life of the assets in conjunction with risk and Level of Service. The whole life costs are to account for the complete lifecycle of the assets, including planning, designing, construction, acquisition, operation, maintenance, renewal, replacement, and disposal costs.

5.4.1 Asset Lifecycle Management Strategy (LMS)

The asset Lifecycle Management Strategy is the set of planned actions that will enable the assets to provide the desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost. The AMP includes a framework to formalize the (LMS), develop a plan to identify the lifecycle actions necessary to continue to provide services in a financially sustainable manner. LMS at TRCA is generally categorized using the below lifecycle activity categories using the six **lifecycle action categories**: non-infrastructure solutions, operations and maintenance, renewal/rehabilitation, replacement, disposal, and expansion.

Table 5.2 - Typical Asset Lifecycle Activities

Lifecycle Activity	Description	Examples
Non-Infrastructure	Actions or policies that can lower costs or extend asset life	Better integrated infrastructure planning and land use planning, demand management, process optimization, managed failures
Maintenance	Regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events	Sewer spot repairs, fixing potholes
Rehabilitation	Significant treatments to extend the life of the asset.	Road resurfacing, Major Roof repairs
Replacement	Activities that are expected to occur once an asset has reached the end of its useful life and renewal/ rehabilitation is no longer an option	Vehicle's replacement, road reconstruction
Disposal	Activities associated with disposing of an asset once it has reached the end of its useful life, or is otherwise no longer needed by the municipality	Salvage or sale of fleet vehicles & equipment, demolition of residential assets
Growth/Service Improvement	Planned activities required to extend services to previously unserved areas - or expand services to meet growth demands	New conservation park; AODA compliance; green focused infrastructure improvements to service existing and new communities

5.4.2 Asset Lifecycle Categories

Non-Infrastructure Solutions

Non-infrastructure solutions refer to actions or policies that can lower costs or extend asset life but are not directly related to work on the asset itself. The types of non-infrastructure solutions include integrated infrastructure planning and co-ordination with other levels of government, demand management through the growth-planning process or continual improvements processes to achieve cost efficiencies. Including master plans, asset management plans, development related studies.

Non-infrastructure solutions are largely captured through the capital budget on an annual basis.

Operations and Maintenance (O and M) Activities

The goal for maintenance is to prevent or mitigate the deterioration of performance of assets in service and manage risk of failures. It is good asset management practice to have a maintenance strategy to

ensure an acceptable level of performance through the useful life of the asset. This includes inspections, testing, monitoring, and preventive maintenance regimes (time based, condition based, usage based). The maintenance activities are funded from the operation budget.

Operation and maintenance (O and M) will not extend the life of an asset or add to its value; however, not performing regular maintenance may reduce an asset's useful life and/ or levels of service. Regular O and M therefore ensures the asset continues to deliver defined levels of services.

Asset O and M requirements and required resources are assessed and prioritized based on:

- Carrying out legislated O and M activities at or above minimum standards to ensure safety and environmental sustainability in accordance with appropriate regulations.
- Conducting routine and preventative maintenance activities to ensure preservation of existing assets; and
- Analysis of current O and M costs of delivering defined levels of services to forecast future O and M costs.

Best asset management practices include an appropriate mix of maintenance management techniques, so the assets do not fail prematurely and continue to perform well throughout their estimated useful life. These maintenance management techniques include:

Preventative Maintenance, which is regularly scheduled maintenance activities, completed while the asset is still in an "operational" condition. The purpose of preventative maintenance is to ensure the asset remains in service throughout its design life.

Demand Maintenance ("**Reactive"**) are physical repairs to an asset that has broken down or has not functioned as intended. The repair generally reinstates the asset to a normal operating condition but does not extend the life of the asset. These types of repairs are expected as assets age and are part of the overall lifecycle management to keep the asset operational for as long as physically and economically viable. It is important to consider that when the repair costs begin to escalate as the asset ages, and it becomes not feasible to operate, the asset may be best renewed or replaced.

Renewal/Rehabilitation Activities

Renewal/rehabilitation activities are mostly associated with significant repairs designed to extend the life of an asset. These types of activities are undertaken at key points in the lifecycle of an asset to ensure the asset reaches or exceeds its designed useful life. The decisions on the scope and timing of renewal are largely based on assessing the conditions of assets. Costs associated with renewal activities are captured through the capital budget and are largely embedded in individual project costs.

Replacement Activities

Replacement activities are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation, or maintenance is no longer an option. Replacement activities are usually considered to be capital in nature as they are usually accounted as fixed costs. TRCA undertakes replacement activities on a regular basis particularly for assets with smaller design lives or rolling stock such as vehicles, furniture, or equipment. The replacement activity costs are captured through the annual capital budget.

Disposal Activities

Disposal activities are actions associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed. Most assets will have one-time associated disposal costs particularly for those that need to be disposed of in an environmentally safe manner. Other assets such as vehicles may be disposed through sales on the used vehicle market or recycled. The disposal costs are captured through the capital budget and are included as part of individual project costs, typically when replacement or major renewal takes place. Additionally, TRCA is working on identifying potential Asset Retirement Obligations (AROs) for its asset categories as mandated by PSAB 3280.

Expansion Activities

These are related to planned activities required to extend or expand the services to accommodate the demands of growth. As development occurs, additional infrastructure is required to service new residents and businesses. For a municipality this would include additional roads, facility space or extended fire services and for TRCA this could include additional erosion control or trail infrastructure. Expansion activities would be new additions to the asset portfolio. Costs associated with expansion activities are capital in nature and are related to acquisition of assets or construction costs of infrastructure. The expansion activity costs are captured through the capital budget.

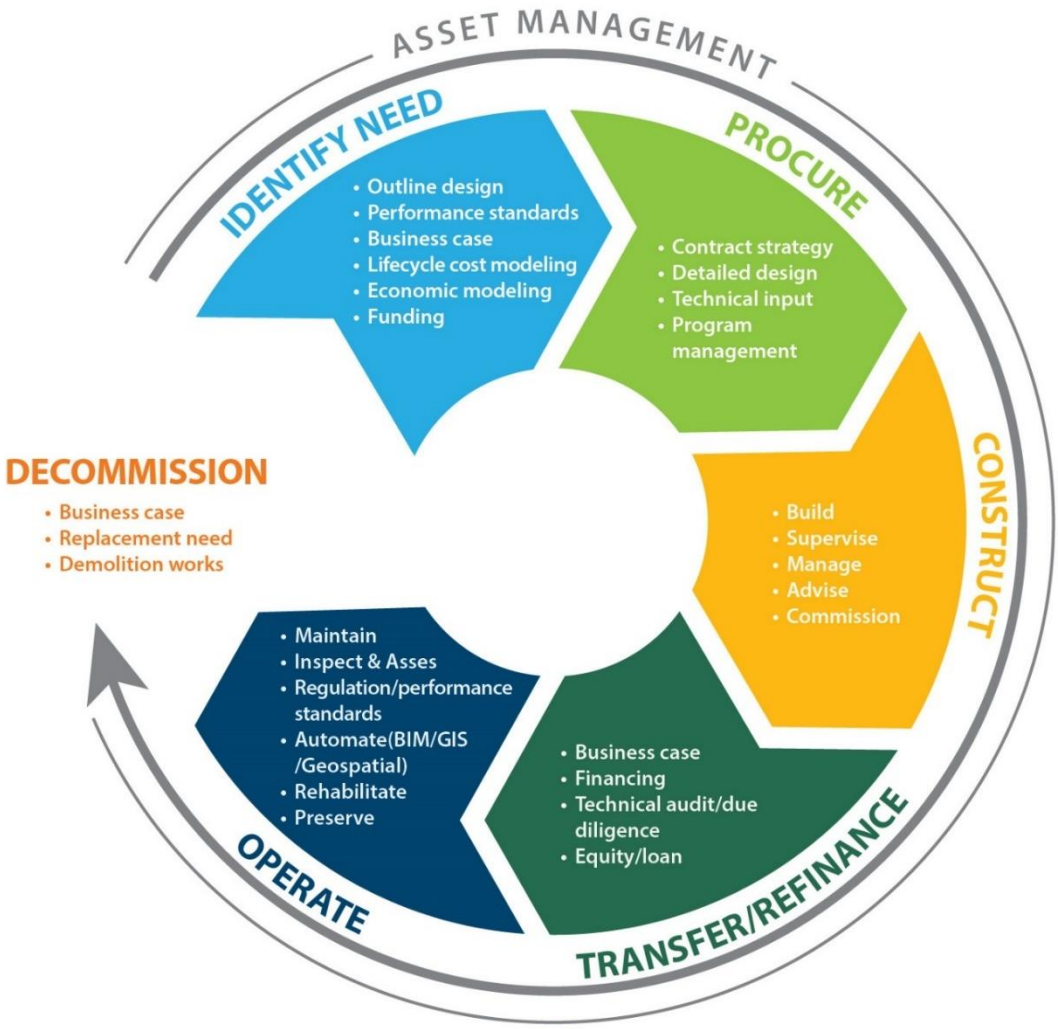
5.4.3 Asset Operation Strategy

Asset Operation concerns the day-to-day operational activities necessary to support asset users, including maintenance, and the delivery of the activities identified through the asset management strategy. The operations component within an asset management lifecycle is shown graphically in Figure 5.6.

Asset Operations are very important in contributing to meeting the required service level and to achieving the organization's objectives. Accordingly, it is important that operators have precise guidelines on how to operate the assets within the appropriate design, the maintenance, and operational parameters.

As an example, Linear Infrastructure comprises a network of generally horizontal assets that may include road pavements, bridges and tunnels, each component having its own requirements for ongoing asset condition assessment, risk assessment, routine maintenance, preservation works, incident management and planned component replacement.

Figure 5.6 - Operations within the lifecycle management of an asset



5.4.4 Asset Renewal Strategy

All assets physically deteriorate at different rates to eventual failure and loss of ability to deliver the required LOS. Asset condition is a measured assessment of an asset's current position or place on the asset "decay" or deterioration curve. Many assets deteriorate slowly at first to a fair condition and, after that, there is more rapid degradation. This typical lifecycle pattern is illustrated in Figure 5.7, which shows the relationship between condition and effective life (i.e., age).

The majority of TRCA's assets in scope of this AMP are rated in **Good** to **Fair** condition; they are good candidates for rehabilitation activities. As evident from the decay curve, it is far more cost effective to maintain and rehabilitate assets before they reach a condition where the only option is costly reconstruction. Understanding the asset's current condition and place on the asset decay curve enables forecasts of future condition and determination of optimal treatment type and timing – key aspects of lowest lifecycle cost renewal decision-making.

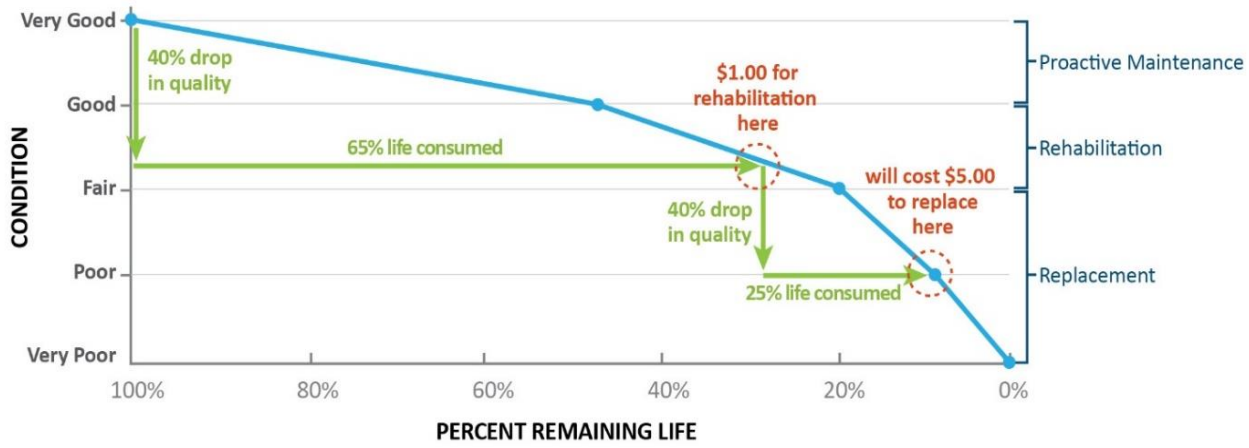


Figure 5.7- Asset Decay Curve

With the utilization of condition assessment reports, TRCA will have a better ability to track asset condition, compare this condition to targets, and use the information to make more effective decisions about renewing or replacing assets.

Table 5.3 – TRCA asset condition within each service area

Service Areas	Very Good	Good	Fair	Poor	Very Poor
Flood Control Infrastructure	13%	42%	34%	10%	1%
Erosion Control Systems	16%	39%	35%	9%	1%
Administration Buildings	83%	10%	7%	-	-
Residential Buildings	-	25%	29%	43%	3%
Parks Facilities	8%	76%	12%	3%	1%
Fleet	23%	24%	16%	18%	19%

5.4.5 Lifecycle Cost Model

The sum of all asset lifecycle management strategies informs the minimum cost to sustain each asset type. These principles are summarized utilizing the lifecycle cost model, which describes both the activities and associated costs to allow assets to provide the desired levels of service. There are several costs undertaken which include initial costs to acquire the asset, Operation and Maintenance (O and M) costs throughout the lifecycle, periodic rehabilitation costs and end of life disposal and replacement costs. The sum of these costs is considered the full lifecycle cost.

- Minimize the total cost of ownership. Failing to take care of assets can impact the total cost of ownership for that asset and can also have other impacts such as negative effects on the levels of service. Renewal and O and M activities should therefore be timed to reduce the risk of failing to provide the levels of service due to deterioration in asset condition, and to minimize the total cost of ownership.
- The deterioration curve maps out the condition of an asset over its life. As the asset ages, deterioration of the asset tends to occur at a faster rate. All assets physically deteriorate at different rates to eventual failure and loss of ability to deliver the desired level of service. Many assets deteriorate slowly at first to a fair condition and, after that, there is more rapid deterioration.
- To understand the condition of assets, condition assessments or inspections need to be undertaken on a regular basis. Asset condition is a measured assessment of an asset's current position or place on the asset deterioration curve.
- A key observation is that it is more cost effective to maintain and rehabilitate assets before they reach a condition where the only option is a considered replacement.

An example depicted in Figure 5.8 illustrates the relationship between lifecycle cost, activity, and timing through the asset life.

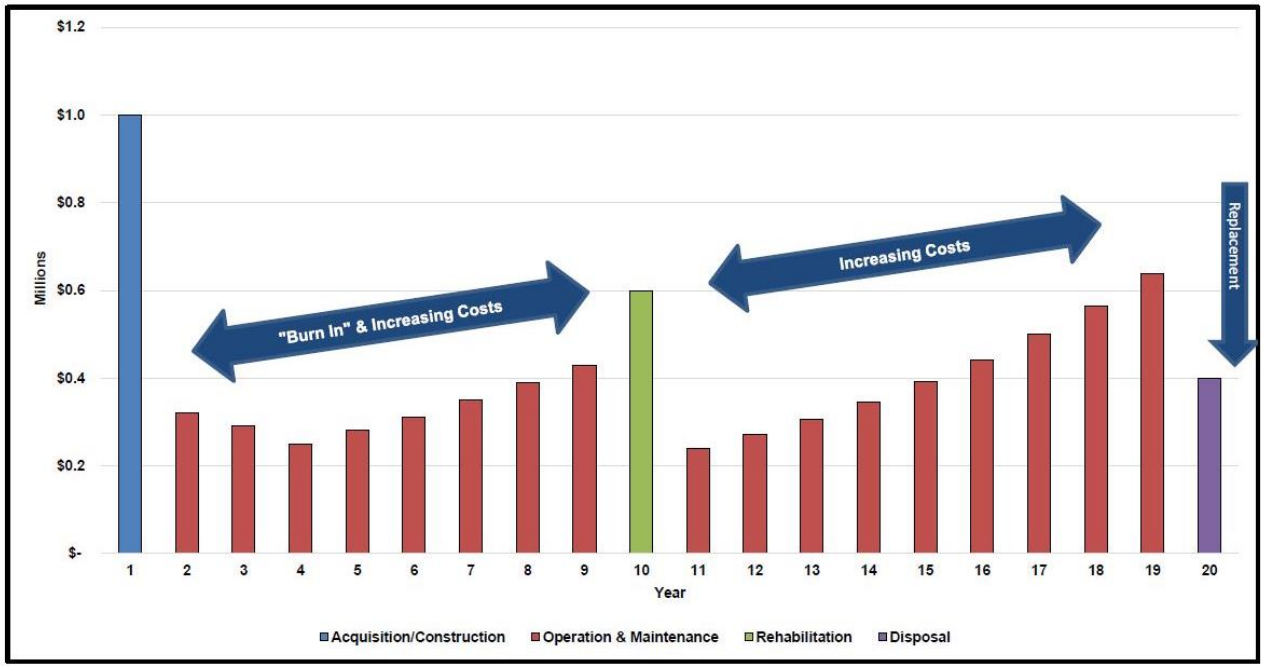


Figure 5.8 - Lifecycle Cost Model

5.5 Capital Prioritization Process

TRCA develops its asset renewal strategies through an annual prioritization process of service area asset renewal submissions. The prioritization of TRCA's capital needs is delivered annually to the Board of Directors the budget and business planning process. Capital needs are not only prioritized at the departmental level but are also prioritized at the corporate level. Corporate prioritization of capital

needs is undertaken by TRCA to assist in the decision-making process for the identification of the most critical projects across the corporation, and for the allocation of limited financial resources to fund asset renewal for the various service areas most in need. The capital prioritization results are reviewed by Senior Management through a variety of filters, and adjustments are made to ensure the most critical needs are approved for the delivery of TRCA's Asset Management Strategy. The five categories used by the corporate capital prioritization process are defined below:

- **Priority - Mandatory:** These projects have locked in commitments or vital components associated with cash flow projects approved by the Board of Directors in prior years. These projects have legal, life safety hazards, regulatory or other mandated requirements, where not achieving these requirements will lead to legal action, fines, penalties, or the high risk of liability against TRCA. These projects cannot be deferred or stopped.
- **Priority - Critical:** These projects maintain critical components in a state of good repair and at current service levels. If not undertaken, there would be a high risk of breakdown or service disruption.
- **Priority - Efficiency or Cost Savings:** Projects that have a break-even or positive return business case over the life of the capital due to operational cost savings or cost avoidance.
- **Priority - Proactive Replacement:** Projects in this category relate to proactive replacement of building systems and components at the end of their useful life. The funding for these projects is needed to maintain targeted service levels and reflects life cycle costing; and
- **Priority - Improve:** These projects provide service enhancements.

5.6 Demand Management

Demand analysis typically includes the analysis of future demand for the product or services being offered, and the requirements this demand will place on the asset portfolio. Currently, demand management is decentralized, however with the implementation of the Enterprise Asset Management Software (EAM), TRCA will aim to standardize the development of a long-term demand management forecast for all major service areas. There are several elements of Demand analysis that need to be considered:

- Historic Demand
- Drivers for demand
- Future demand and change in demand over time
- Changes in required levels of service
- Current and future utilization and capability of assets
- Impact on future performance, condition, and capability

At this stage of the AMP, most of the costs associated with the demand activities identified are related to changing demographic trends and technological advancements. However, it is recognized that continued efforts through the individual departmental plans and future AMP updates will continue to evolve this framework and the correlation between demand and costs. Undertaking an in-depth analysis on a service area basis will allow for a more refined look at the different demand drivers affecting each and allow for better monitoring of their effects going forward.

Section 6:

FINANCING STRATEGY

SECTION 6: FINANCING STRATEGY

The financing strategy is predicated on the financial state of the TRCA including revenues, operational and capital expenditures, reserves/reserve fund, and forecasted future commitments. The importance of the assets along with their significant capital and operating budget implications are intended to inform TRCA's long-term financial and service delivery planning.

6.1 Assumptions

The following types of assets are not included in this financial strategy:

- Land and land improvements which are anticipated to be added in the following year as part of Green Infrastructure update to the Asset Management Plan;
- Historical treasures, including artifacts and buildings;
- TRCA's Fleet assets – capital acquisition costs and operational expenses are offset via interdepartmental recoveries. Supluses are deposited into fleet reserve fund to replenish any deficits due to unanticipated/ unplanned capital acquisitons.

6.2 Sources of Funds and Financial Planning at TRCA

TRCA's annual budget process is closely tied to the budget process of its partner municipalities. As half of the revenues for TRCA are municipal contributions, the annual budget is approved only after each partner municipality council approves their contribution. Major contributors to TRCA's budgets are 1) The City of Toronto, 2) Region of York, 3) Region of Peel and 4) Region of Durham. Other contributors to a much lesser degree include senior levels of government depending on grants available through government programs.

The eligibility of municipal funding is based on three categories:

1) Mandatory Programs and Services – TRCA is required to provide in its jurisdiction, and eligible to be funded by participating municipal levy.
2) Municipal Programs and Services – TRCA agrees to provide on behalf of a municipal partner and is eligible for funding based on a MOU or an agreement.
3) Other Programs and Services – Supplemental to the above two categories, eligible for municipal funding (wholly or partially) through a cost apportioning agreement.

Of the Major Service Areas within this Asset Management Plan, Flood Control Infrastructure and Erosion Control Infrastructure fall within Mandatory and Municipal Programs and Services. The Public Building Facilities (Administrative, Residential and Parks) as well as Fleet infrastructure would be categorized as Other Programs and Services.

Capital expenditures have been primarily financed through municipal capital levies, which accounted for 85% of building maintenance, 76% of flood infrastructure maintenance and 93% of erosion control infrastructure maintenance since 2012.

The remaining 19% of flood infrastructure maintenance has been facilitated by MNRF Section 39 funding and other provincial grants. 7% of erosion control infrastructure maintenance has been financed by federal and provincial grants. TRCA's corporate buildings, education centers and conservation area maintenance has been supported by government and non-government grants (8%) in addition to the Toronto and Region Conservation Foundation (6%).

In addition to governmental funding and grants, TRCA supplements its revenues through Authority Generated Revenue such as user fees, rental income, and land sales. Donation of cash or in-kind also factor into the overall revenue structure for the TRCA.

6.3 Forecasted Needs and Funding

An assessment of the current state of infrastructure and desired level of service are outlined in sections 7 through 12 for each of TRCA's major asset classes. A summary of TRCA assets, excluding Fleet, is provided in Table 6.1 below:

Table 6.1 – Funding Summary by Service Area (2023 numbers)

Service Area	Replacement Cost (million)	Annual Capital Need - 10 years (million)	Annual Capital Funding Available (million)
Administration Buildings (excluding Head Office)	$ 15.31	$0.4	$0.5
Residential Buildings	$33.4	$0.9	$0.2
Parks Public Buildings	$76.1	$4.4	$2.0
Erosion Control Infrastructure	$376.5	$14.3	$11.4
Flood Control Infrastructure	$197.7	$3.4	$0.5

Table 6.2 - Summary of TRCA assets by Service Area

Service Area	Target Reinvestment Rate	Actual Reinvestment Rate
Administration Buildings	2.61%	3.29%
Residential Buildings	2.69%	0.59%
Parks Public Buildings	5.78%	2.63%
Erosion Control Infrastructure	3.79%	3.02%
Flood Control Infrastructure	1.72%	0.25%

Individual asset management plans for each of TRCA's asset types indicate that current levels of financial contributions for capital repair and replacement are not sufficient to fully fund the forecasted financial need for TRCA's major infrastructure assets until 2034.

Flood

Funding for the operation, maintenance, inspection, and repair of TRCA flood infrastructure is from several sources including MNRF Section 39, and grant funding such as Water and Erosion Control Infrastructure funding, National Disaster Mitigation Program, Disaster Mitigation and Adaptation Fund and Investing in Canada Infrastructure Plan funding. Currently, Flood Infrastructure allocates approximately $0.5 million in funding to capital projects. However, TRCA's aging flood infrastructure requires significant investment to meet state of good repair and public safety requirements.

Current capital funding from municipalities and the Province is inadequate to be able to perform the large capital repairs required to ensure dams, channels, and dikes are performing safely. Currently, the deficit in capital repairs to all TRCA owned flood infrastructure is approximately $34 million. This number will grow as infrastructure continues to age. TRCA is currently focusing on the highest priority capital projects to reduce immediate risk to the public.

In addition to capital repairs, TRCA is focusing on decommissioning structures that are no longer required and cannot be reasonably upgraded to meet current guidelines and standards. This eliminates long-term operational and capital investment while allowing for naturalization of the land no longer needed for the asset. Operating accounts, responsible for the day-to-day operation, preventative maintenance, and inspections on flood infrastructure have not kept up with rising costs. Decommissioning costs are included in the $34 million cost estimate for capital work.

Erosion

Based on the current state of the erosion control systems, the current forecasted funding should support 79.9% of the renewal needs to maintain these assets in an acceptable condition. The renewal needs are significantly funded by the City of Toronto, since 69% of TRCA's assets are located within the City. The biggest funding gaps are currently for assets located in York Region, the Region of Durham, and the Region of Peel, where the ERMP receives limited funding to maintain 31% of TRCA's assets, which represents 89 different erosion control systems. TRCA's ERMP will continue to work with its municipal partners and senior governments to support the maintenance of erosion control systems that protect publicly owned and privately-owned infrastructure from the natural hazard of erosion. Where TRCA has no funding for the maintenance of its erosion control assets, the ERMP will work with its municipal partners on a recoverable basis to be able to maintain TRCA's erosion control assets.

The ERMP is expecting a capital budget for the City of Toronto and York Region of approximately $105.98 million (excluding 2023) towards the renewal of TRCA's erosion control assets. At present, the waterfront assets are undergoing major maintenance over the next 10 years. Although some factors are unpredictable, such as storm events and high lake levels, it is estimated that the waterfront assets backlog balance will decrease to 38% by the end of 2033. In the next decade, the total funding for the valley and river assets will increase by a total of approximately $10 million compared to the last decade of funding. This total forecasted funding of $26.01 million over the next 10 years will not be enough to address the maintenance of the forecasted backlog of 49% of the valley and river assets by the end of 2033.

Currently, an additional annual investment of $2.86 million would allow the Erosion Risk Management Program to maintain all the assets in 'acceptable' condition. This level of investment would minimize the overall asset management risk, prevent premature deterioration of TRCA's erosion control systems, and eliminate the unfunded renewal need. Future projections will improve with continued refinement of the erosion control asset data.

Buildings – Administration, Residential and Parks

Each category of building portfolio varies in age, condition and remaining service life and thus faces unique financial challenges and requires tailored strategies to ensure long-term sustainability and maintenance.

The completion of the Building Condition Assessments of TRCA's building assets has provided the financial information required to approach municipal partners regarding additional levy to support current assets within their respective jurisdictions. This work will also be used to inform grants to senior levels of government and for fundraising purposes.

Administrative Buildings

For administrative buildings, excluding the new Head Office, the total maintenance expenditure required from 2024 to 2034 is estimated at $4.37 million, with an Average Annual Required Investment (AARI) of $436,795 against an average annual budget of $500,000. However, the actual annual expenditures would vary by year depending on the planned projects. To address potential funding shortfalls, particularly anticipated in 2029, TRCA should prioritize critical capital projects during surplus years and build capital reserves. A combination of early project completion and reserve accumulation can help smooth out annual funding fluctuations and ensure continuous maintenance of the administrative buildings within the target condition range.

Residential Buildings

Given the age of residential buildings, approximately 43% of the portfolio is in poor condition. There is a significant deferred maintenance backlog of $3.096 million as of 2023, with total required spending from 2024 to 2034 projected at $9.15 million. Given the current spending on maintenance and repairs, which stands at 38% of approximately $900,000 in gross revenues, TRCA should increase this percentage and strategically time essential projects to align with revenue peaks, specifically before 2026 and 2031. Additionally, accumulating reserves during surplus years and conducting a thorough portfolio analysis to divest surplus assets or enter into updated agreements with tenants when possible on underperforming assets we must maintain, will help provide necessary funds and reduce long-term deferred maintenance, ensuring the residential buildings remain in fair condition.

Parks Facilities

Parks facilities currently have a $11.7 million deferred maintenance backlog. With an annual investment requirement of $4.4 million against an average annual revenue of $2.0 million, this discrepancy will likely result in a growing backlog, projected to reach $35.7 million by 2034. To mitigate this, TRCA should bundle or advance critical projects during surplus periods and utilize corporate capital reserves, at the Board's discretion, in a phased approach to reduce the State of Good Repairs (SOGR) backlog. Drawing

from reserves during years of funding pressures will help maintain the parks facilities in good to fair condition, preventing service level declines and infrastructure deterioration.

6.4 Capital Reserve for Infrastructure Assets

At this time, TRCA does not maintain a reserve for infrastructure assets. Amounts not earmarked for any particular business unit will annually be directed to the corporate reserve and used for corporate endeavors, as outlined in annual budget submissions.

Reserve allocations are approved by TRCA's Board of Directors typically following a report with recommendations of staff. TRCA staff may recommend its accumulated surplus to capital reserve to finance the cost of tangible capital assets purchases, maintenance, and related capital expenditures.

TRCA staff will be examining with its municipal partners, options for how the reserve can be supplemented to address projected infrastructure investment needs through modest increases on service rates or other means through ongoing budget discussions with our municipal partners.

Erosion Control Systems

SECTION 7: EROSION CONTROL SYSTEMS

Introduction:

TRCA owns 282 erosion control systems across its jurisdiction, each built to protect privately and publicly owned assets. TRCA's Erosion Risk Management Program (ERMP) that is part of the Restoration and Infrastructure division (R and I) is responsible for the monitoring and maintenance of these assets. This number constantly fluctuates as TRCA completes multiple projects per year to address new erosion hazards or changes at existing sites; and we often find legacy or other unknown structures on TRCA property that become adopted as assets. The 282 erosion control systems are made up of a total of 824 erosion control structure parts, and the total replacement value of all these systems is estimated to be $376 million by the end of 2023. TRCA's erosion control systems are not traditional assets in the sense that their degradation and/or failure is not necessarily a negative outcome if the infrastructure that they are protecting is not at immediate risk. Through a more traditional Asset Management Plan (AMP) approach, the erosion control infrastructure owned by TRCA are reported through four components:

- Asset inventory
- Levels of service
- Asset management strategy
- Financial strategy

Mandated Services

Pillar 1 of TRCA's 2023-2034 corporate Strategic Plan states that TRCA will "deliver provincially mandated services pertaining to natural hazards including flood and erosion", more specifically, through conducting inventories of erosion infrastructure and monitoring conditions when funding is available. Over the last half century, TRCA has made significant investments to construct and maintain its inventory of erosion control systems to meet the objective of protecting the public from erosion and slope instability. As part of the revised *Conservation Authorities Act* (the Act), TRCA's ERMP provides mainly 2 types of programs and services to its municipal partners under Section 21 of the Act. Specifically, Section 21 states that conservation authorities are empowered to:

a. Provide mandatory programs and services related to the risk of natural hazards or related to the conservation and management of land owned or controlled by TRCA (category 1)

b. Any programs and services that may be provided on behalf of a municipality situated within TRCA's jurisdiction under a memorandum of understanding (category 2).

As part of its Strategic Plan, TRCA choose to further develop and maintain category 1 and category 2 programs and services to prevent loss of life and property damage from flooding and erosion hazards. To meet this objective, TRCA constructs and maintains erosion control and slope stabilization structures fitting the category 1 services and programs under the Act. TRCA also commissions geotechnical studies and watercourse assessments to provide detailed analyses and outline potential root causes of the deficiencies discovered during the investigation. These studies and assessments are critical in identifying strategies to address risks to our communities and to planning future capital projects.

State of TRCA's Erosion Control Infrastructure

7.1 Asset Data Inventory

As of July 2023, TRCA owns and maintains 282 erosion control systems across its jurisdiction, with 253 systems located along the slopes and riverbanks of TRCA's watersheds, and 29 systems located along the Lake Ontario shoreline between Ajax (to the east) and the border of Toronto and Mississauga (to the west).

TRCA maintains comprehensive inventory, condition, and maintenance priority data for all these erosion control assets in TRCA-developed *Stream, Erosion, and Infrastructure Database* (SEID). TRCA also assesses and maintains an inventory of known erosion hazards rated in order of risk, which may become future erosion control assets if stabilization works are completed. These assets are mainly designed to protect essential municipal, regional, and private assets, such as sanitary sewers, roads, and dwellings. The erosion control systems range in age from a few months old to 60 years old and approximately 11% of them are rated as being in 'Poor' or 'Very Poor' condition and therefore require capital improvements to restore them to an 'Acceptable' condition.

To obtain an overview of TRCA's erosion control assets network for the valley and river segments and waterfront segments, the following asset conditions were documented: current state; inventory; valuation; age; and condition. The ERMP assesses each part of these erosion control systems to efficiently monitor the condition of these assets and assess erosion hazards to public safety and essential structures. This also helps improve planning and maintenance of these systems. The valley and river segment are categorized as either valley or watercourse erosion control systems, and this is based on the location of these structures within the geological valley. The waterfront systems are simply categorized as waterfront segment type.

7.2 Asset Valuation

In order to proactively manage assets through their full life cycle, estimated replacement costs are calculated to ensure appropriate funds are being set aside for the future rehabilitation and replacement of assets as required. Replacement values do not account for major expansions, and do not include costs associated with potential environmental assessments, land acquisitions or significant provincial or federal permits that may be required as a result of a major expansion in the footprint or function of the asset.

Replacement values are used as the basis for estimating the cost of replacing an asset when it reaches the end of its engineered design life. The total replacement value of the erosion control assets in this AMP is $185.03 million for the river and valley assets compared to $191.44 for the waterfront assets, which sum up to $376.47 million. The replacement value was determined using standard accounting methodology based on historic costs, an estimated service life, and inflationary effects.

As shown in Figure 7.1, replacement value of TRCA's assets is much greater in the City of Toronto (roughly $340 million at the end of 2023), than in Peel, York, and Durham Regions combined (roughly $37 million). This is partly due to all of TRCA's waterfront erosion control structures being within the City of Toronto limits, along with the denser and earlier historical development of the City of Toronto

compared to other regions in TRCA's jurisdiction. It was estimated that a total of $41 million of TRCA's assets are currently in need of major maintenance, excluding the assets that need minor repairs. The backlog is categorized by systems that are past their useful life of 25 years. These systems are more prone to failure due to their age. A total replacement value of $200 million is in the backlog.

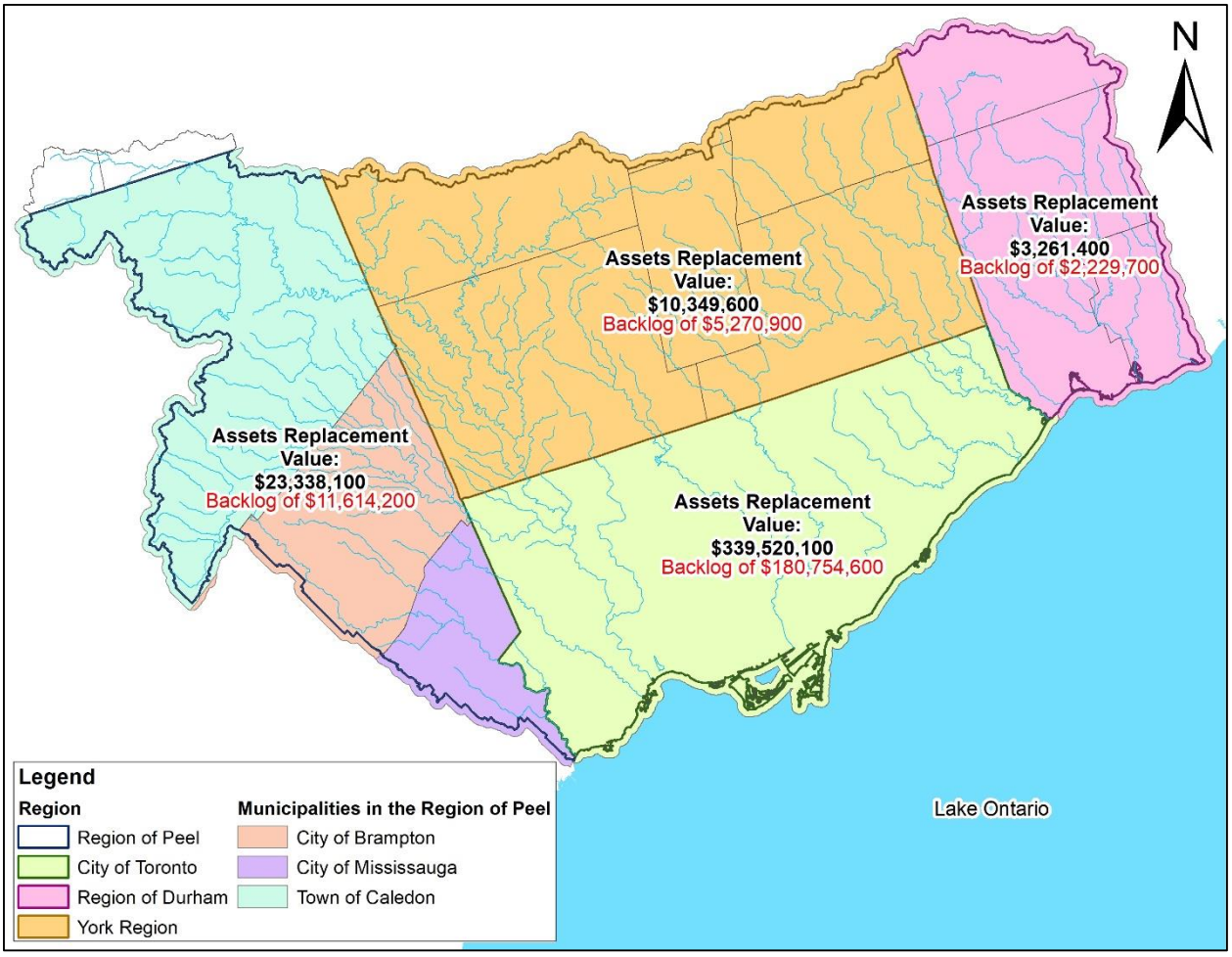


Figure 7.1 - Total replacement value of TRCA's erosion control assets (end of 2023) based on their regional location in TRCA's jurisdiction.

TRCA currently owns 43 erosion control systems protecting 57 clusters of underground infrastructure and other assets owned by the Region of Peel. These assets' replacement value in the City of Mississauga totals $12.9 million compared to $7.7 million and $2.7 million in the City of Brampton and in the Town of Caledon, respectively.

TRCA's ERMP is constantly innovating as we are developing more efficient processes to assess risk and make decisions related to erosion and slope instability hazards in our jurisdiction. It should be noted that the replacement value of most of these assets is based on the original construction cost with an annual inflation rate. Therefore, the asset replacement value does not fully consider the ERMP's expertise in monitoring, managing, and building such structures in present conditions as some costs are omitted in this approach due to the different design and permitting requirements for legacy structures.

7.3 Asset Useful Life

The useful life of erosion control assets is highly variable depending on the return period storm that the asset was designed to withstand and the actual number of storm events that occur over time, which meet or exceed the design storm.

The typical return period design storm for most erosion control assets ranges from the 10-year storm to the 100-year storm. The 100-year storm is not an event that occurs every 100 years, but rather an event that has a 1 in 100 (or 1%) chance of occurring in any given year. The service life of erosion assets, based on annual and post-storm monitoring, ranges between 10 and 50 years before major maintenance or complete replacement is required. It is important to note that the replacement schedule for erosion control assets will vary significantly. It is mainly based on frequency of maintenance, through minor works, used to keep the assets in an 'Acceptable' condition. In its financial strategy, however, the actual replacement schedule must remain flexible and give staff the ability to update it as needed in response to significant changes in a structure's condition following major storm events.

Each year, TRCA completes a State of Good Repair (SOGR) Backlog Analysis to identify which assets are required to be replaced in its 5 and 10-year capital plans by regional municipality, and to support requests for additional funding where it can be demonstrated that there is a backlog of maintenance required beyond the funding envelope provided. As shown in Figure 7.2, the depreciation of an asset leads to degradation, and ultimately, failure. Although time is an important factor, the ERMP is slowly shifting its focus to undertake more frequent maintenance of its assets to extend the useful life of its erosion control structures. This effort to conduct more frequent maintenance work is anticipated to lead to major cost savings in the long term as higher costs for major maintenance works should be reduced.

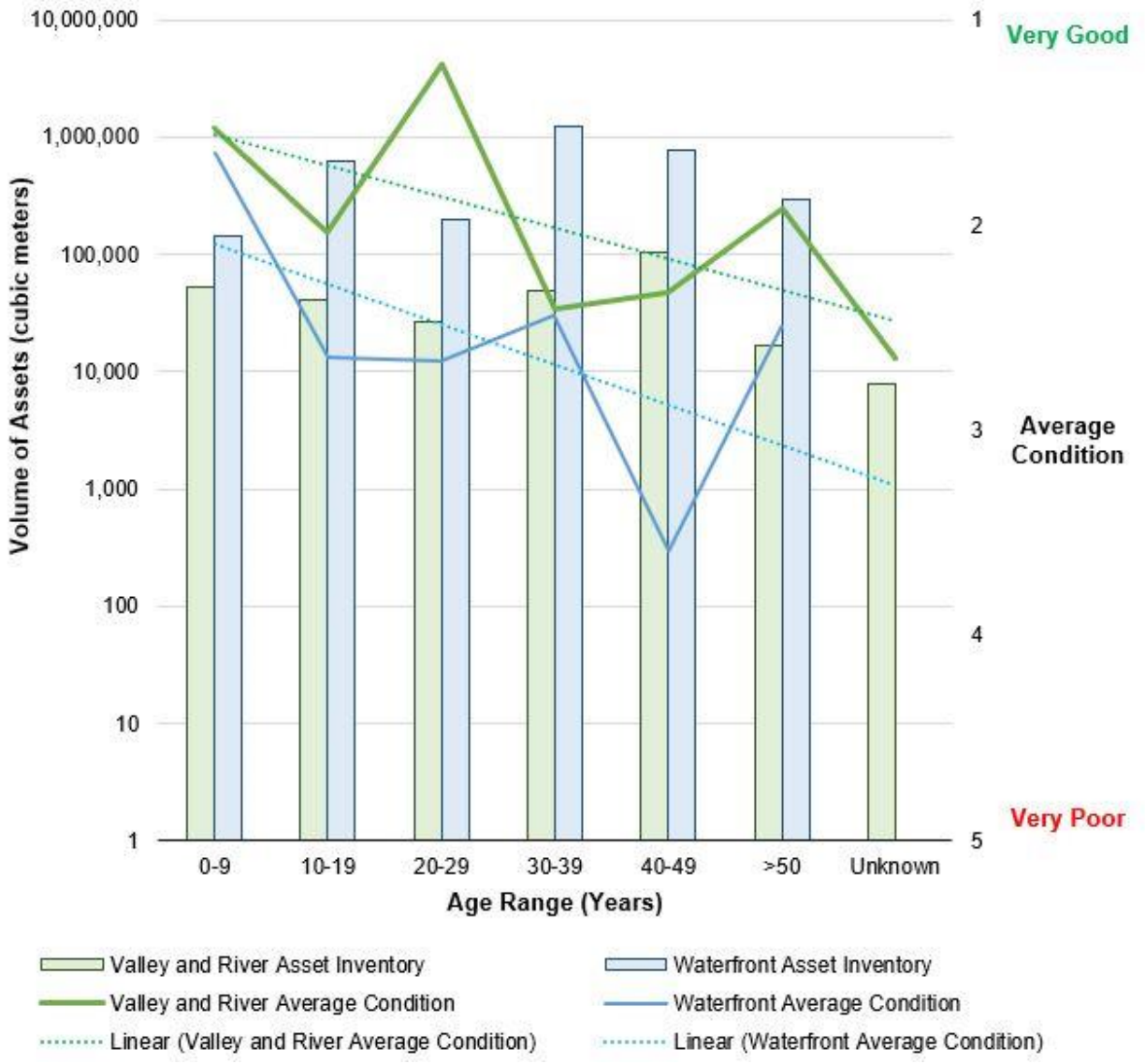


Figure 7.2 - Erosion control assets' condition based on age adjusted by their size.

7.4 Asset Condition

The condition of erosion control assets is reviewed and analyzed on a regular basis by both internal staff at TRCA and external engineering consultants. Details related to the condition of these assets can be found within inspection records in TRCA's SEID.

Based on overall score ranges, each erosion control asset was assigned the corresponding condition and numerical rate, as outlined in **Error! Reference source not found.**. The current scoring system is slightly subjective and can vary depending on the inspector's perspective. While the inspector's assessment skills and knowledge are valued, the current rating system will be replaced with an updated numerical scoring system in the next few years.

Table 7.1 - Condition rating of TRCA's erosion control assets

Asset Condition	Definition	Percentage of Assets
Very Good 	No deficiencies or very minor deficiencies were observed. No observed risk to infrastructure that erosion control structure is protecting, or public safety.	16.0%
Good 	The erosion control system is overall in good condition. Minor to moderate deficiencies or deterioration observed may require further attention. Minor risk to infrastructure that erosion control structure is protecting, or public safety.	38.7%
Fair 	The erosion control system is in a failing condition. Moderate deficiencies or deterioration were observed, and displacement of material may start to affect the parts' constructed purpose; therefore, it is putting the infrastructure it is protecting at a greater risk, or public safety. Some areas of the system may require preventative actions.	34.8%
Poor 	The erosion control system is in a failing condition. Moderate to major deficiencies or deterioration were observed. Public safety and the infrastructure that is being protected by the erosion control system may be at risk.	9.6%
Very Poor 	The erosion control system has failed or may imminently fail; the system is no longer performing its constructed purpose. Major to significant deficiencies and/or complete displacement of the system's material may have occurred. The infrastructure protected by the erosion control system and/or public safety is at high risk.	1.1%

TRCA has made significant progress in upgrading the condition of its erosion control assets over the last twenty years. Numerous projects have been undertaken to replace failed structures and to construct new assets where public safety and/or essential structures have been deemed at risk through engineering studies.

Various parts of the erosion control systems may be in better or worse shape, an analysis by the ERMP staff has determined that 89% of these assets are in an 'acceptable' condition (better than or equal to 'Fair'). Although the waterfront assets represent a small quantity of assets in number, their size (in volume) is significant compared to the valley and river assets (Figure 7.3**).** Therefore, only 3 'Poor' condition waterfront assets represent more than 95% of the total volume of all 'Poor' condition assets.

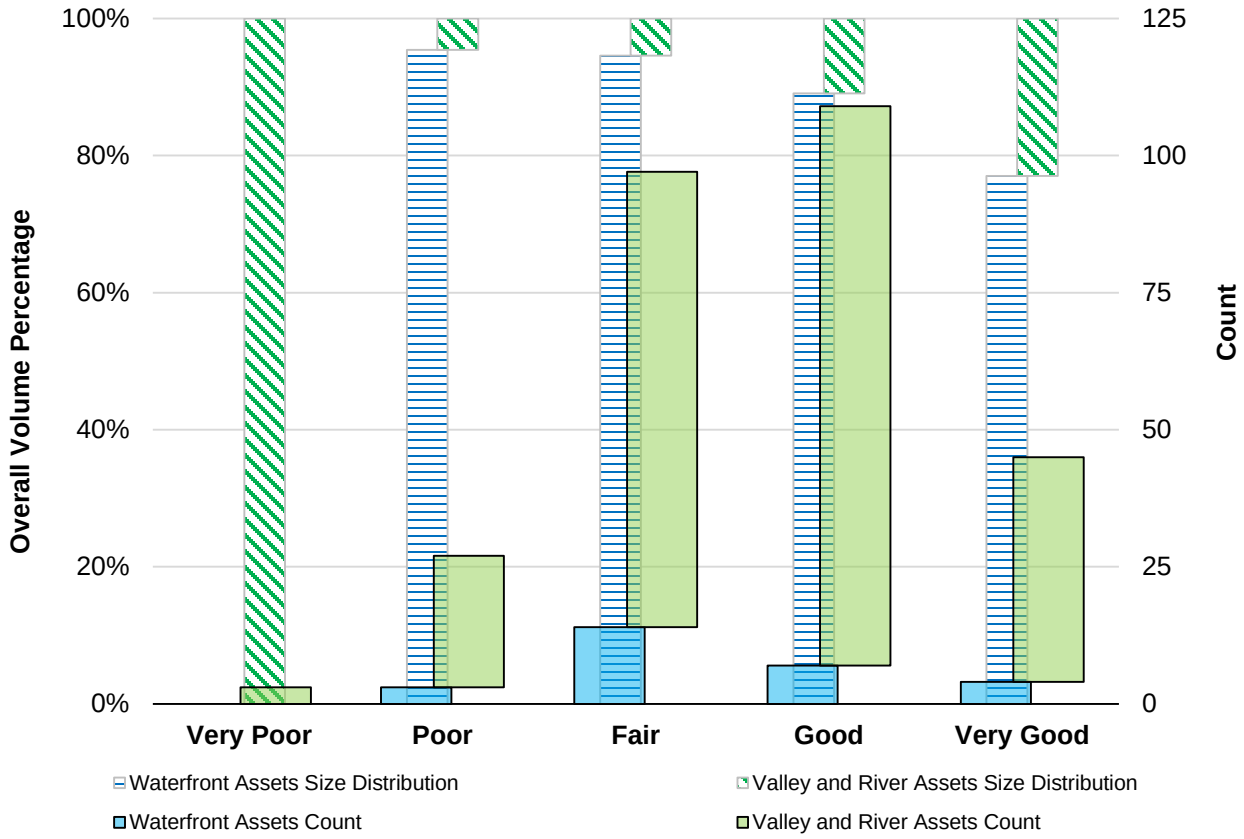


Figure 7.3 - Condition of all erosion control systems compared to their volume percentage and count.

TRCA's erosion control assets are unconventional. Since these systems are preventing the removal/displacement of material (i.e., erosion), the size of these assets is determined by volume (**Error! Reference source not found.**). The factsheet regarding the valley and river assets and waterfront assets can be found on pages 74 and 75, respectively.

Table 7.1 - TRCA's erosion control systems summarized by segment type

Segment Type	Category	Count	Total Size (m^3) *	Replacement Value (end of 2023)
Valley and River	Valley	51	121,030	$ 55,695,100
	Watercourse	202	176,200	$ 129,338,400
Waterfront	Waterfront	29	3,361,670	$ 191,436,100
Total		**282**	**3,658,900**	**$ 376,469,600**

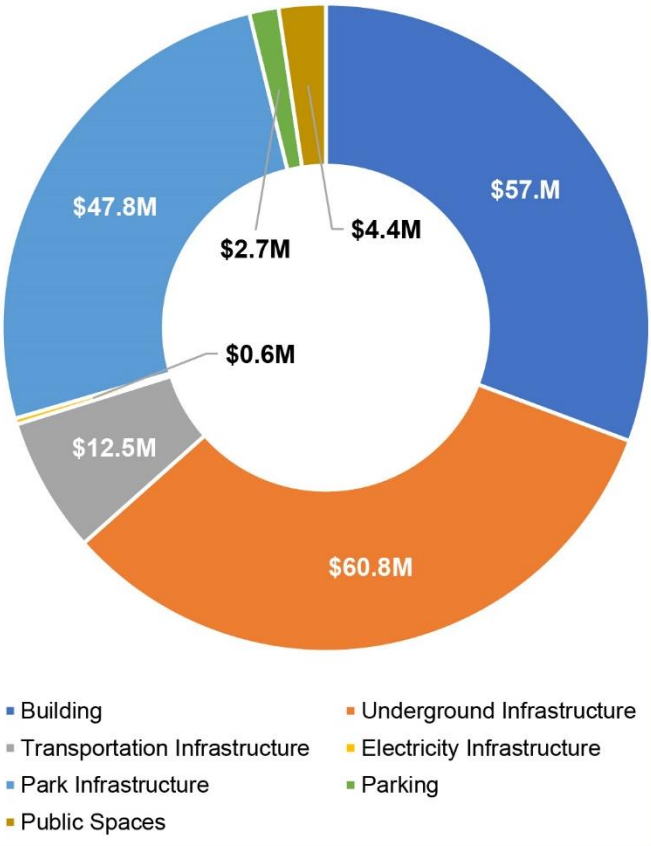
* Based on the original footprint of the assets when it was first constructed (if applicable)

VALLEY AND RIVER ASSETS FACTSHEET

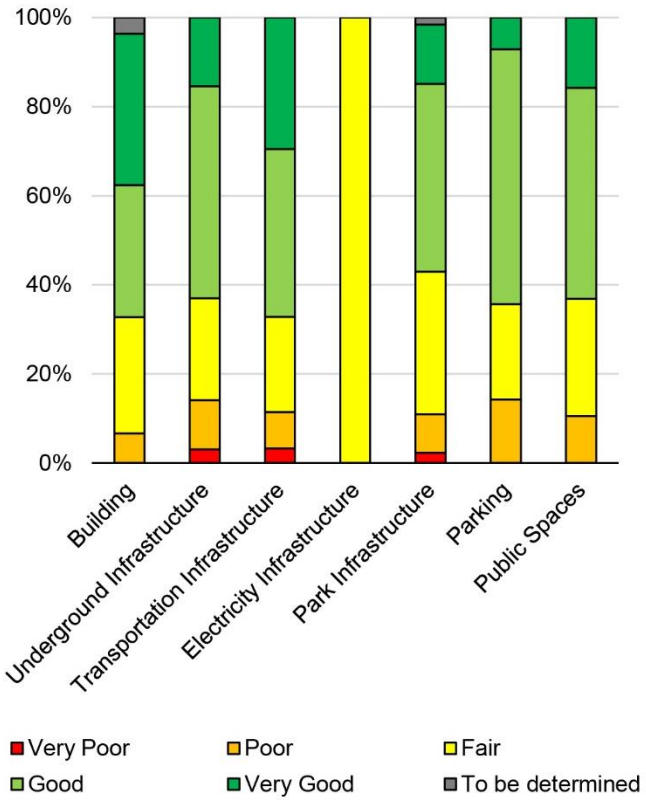
Total Asset Replacement Value:	**$ 185,033,477**
Current Condition:	**● Good**
Future Condition Trend (next 10 years):	**↓Degradation**
TRCA Strategic Plan:	Pillar 1 – Environmental Protection and Hazard Management
Assets Included in this Factsheet:	Valley erosion control systems, and Watercourse erosion control systems
Data Confidence and Reliability:	Moderate, because of high subjectivity and low consistency

The total replacement value of TRCA's valley and river erosion control systems is $185.0 million, where 57% of the assets are in 'Good' to 'Very Good' condition, and 33% are in 'Fair' condition. Approximately 48% of these assets are past the end of their service life and are more prone to degrade. TRCA's valley and river erosion control systems are overall in 'Good' condition, these assets are meeting the current needs, but they are aging and will require attention.

TOTAL REPLACEMENT VALUE BY PRIMARY CUSTOMER LEVEL OF SERVICE



AVERAGE CONDITION DISTRIBUTION OF THE SYSTEMS' PARTS BASED ON PRIMARY CUSTOMER LEVELS OF SERVICE

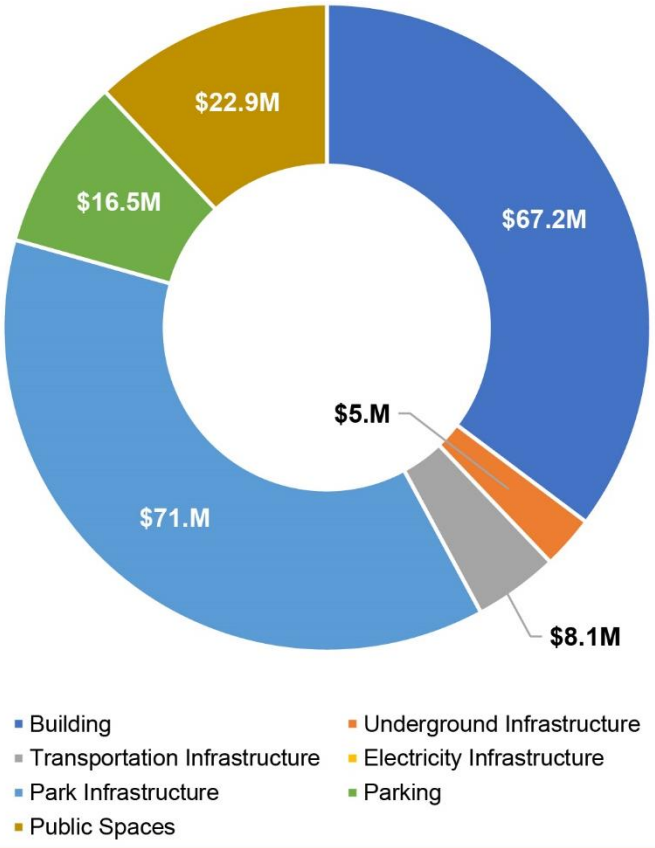


WATERFRONT ASSETS FACTSHEET

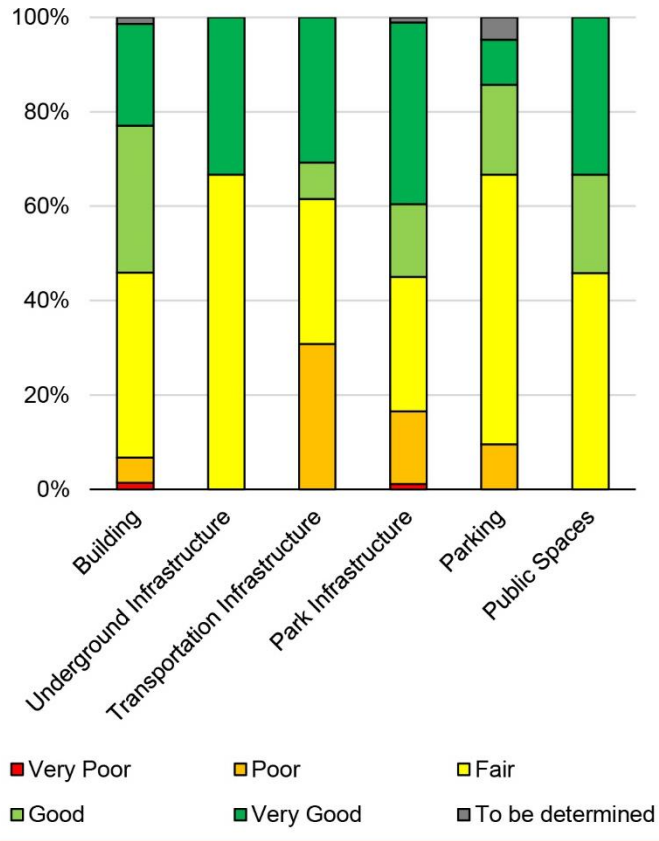
Total Asset Replacement Value:	**$ 191,436,082**
Current Condition:	**Fair**
Future Condition Trend (next 10 years):	**Good** (maintenance scheduled)
TRCA Strategic Plan:	Pillar 1 – Environmental Protection and Hazard Management
Asset Included in this Factsheet:	Waterfront erosion control systems
Data Confidence and Reliability:	Moderate, because of high subjectivity and low consistency

The total replacement value of TRCA's waterfront erosion control structures is $191.4 million where 42% of the assets are in 'Good' to 'Very Good' condition, and 32% are in 'Fair' condition. Approximately 57% of these assets are past the end of their service life and are more prone to degrade. TRCA's waterfront erosion control systems are in an 'acceptable' condition. They are scheduled for maintenance within the next decade.

TOTAL REPLACEMENT VALUE BY PRIMARY CUSTOMER LEVEL OF SERVICE



CONDITION DISTRIBUTION OF THE SYSTEMS' PARTS BASED ON PRIMARY CUSTOMER LEVEL OF SERVICE



7.5 Levels of Service

The level of services (LOS) of the tangible capital assets referred to in this plan, the erosion control assets, are key business drivers and influence the asset management decisions by the ERMP. In accordance with the Act and TRCA's Pillar 1 (Environmental Protection and Hazard Management) of the 2023-2034 Strategic Plan, **Error! Reference source not found.** provides an overview of the core objectives of the ERMP when it comes to TRCA's erosion control systems based on the three key LOS. Ultimately, these assets support TRCA's mission to **be a provincial leader in conserving, restoring, and managing natural resources to advance safe and sustainable development**.

Table 7.2 - Overview of Level of Service (LOS) of the erosion control assets

LOS	TRCA Strategic Plan	Approach
Corporate	Mitigating hazard risks to communities and protecting the natural environment.	Functional erosion control systems to mitigate hazard risks to safeguard public safety and protect essential infrastructure.
Customer	Deliver provincially mandated services pertaining to natural hazards including flood and erosion.	Maintain erosion control systems through partnership with communities, municipalities, and government to deliver erosion hazard and slope instability monitoring services and remediation works (category 1).
Technical	Monitor health of erosion control systems and maintain these assets functional.	Monitor and maintain erosion control assets to ensure they are providing adequate customer level of service.

7.5.1 Corporate Level of Service

Based on Pillar 1 of the 2023-2034 Strategic Plan, TRCA aims to mitigate hazard risks to communities and to protect the natural environment. Erosion control systems mitigate hazard risks to safeguard public safety and protect essential infrastructure. From an asset management perspective, the ERMP is responsible for supporting this corporate LOS through the monitoring and maintenance of the erosion control assets.

7.5.2 Customer Level of Service

These assets provide erosion control and slope stability services to different types of customers. Due to limited levy funding (category 1 programs and services of the Act), the ERMP can only maintain these systems through partnership with communities, municipalities, and government (category 2 programs and services of the Act). The different type of infrastructure directly and indirectly protected by the erosion control systems are identified in Table 7.3. These types of infrastructure can be publicly or privately-owned assets. This table summarizes all the infrastructure cluster types each part of the erosion control systems is protecting. For example, an erosion control system can be designed and built to protect a sanitary sewer running parallel to the riverbank (direct protection), the trail adjacent to the sewer is also benefiting from this erosion protection (indirect protection).

Table 7.3 - Customer LOS of the erosion control systems

Safety Consideration	Asset Clusters Protected	Count
Essential Structures	Building	322
	Underground Infrastructure	331
	Transportation Infrastructure	152
	Electricity Infrastructure	3
Public Safety Concerns	Park Infrastructure	323
	Parking	50
	Marina	24
	Public Spaces	52

In the above table, the building assets protected refer to essential structures, such as commercial buildings, residential detached or multi-residential buildings, etc. The underground infrastructure encompasses sanitary sewer, watermain, and stormwater infrastructure. The transportation infrastructure can refer to regional or municipal roads, railway, emergency, or maintenance access, etc. The electricity infrastructure refers mainly to transmission towers and utility posts. The park infrastructure refers to paved/formal trails and pedestrian bridges (including trail-connected maintenance access bridges).

The ERMP will improve this dataset over the next years by incorporating the scale and the specific type of assets receiving services from the erosion control systems (i.e., how many and what type of buildings are protected by the erosion control systems, what length of trail/road/railway is protected by the erosion control systems, etc.).

7.5.3 Key Stakeholders

Based on the type of assets protected, the location, and the current and historical ERMP partnerships, an overview of the main stakeholders for each type of protected asset is summarized in this section. Confirming the landownership of the protected structures will is a significant undertaking, which will be part of the data evolution and refinement over time as described in the previous section.

When it comes to erosion control systems protecting buildings and underground infrastructure, the current and historical partnerships and funding bring insights to the stakeholders receiving the erosion control and slope stability benefits. Approximately 80% of the building clusters protected are privately-owned by Torontonians. This increased significantly following the July 2013 storm event.

Financial strategy For underground infrastructure, 80% of the assets receiving erosion protection are owned by Toronto Water compared to 17% owned by the Region of Peel and 2% owned by York Region. This is the product of the evolution of the ERMP within each of these municipalities.

For the other protected assets, history and funding do not reveal many details on the exact ownership of these public and private assets. Rather than making assumptions on the beneficiary of the services provided by the erosion control assets, Figure 7.2 summarizes the location of the different protected assets within each municipality.

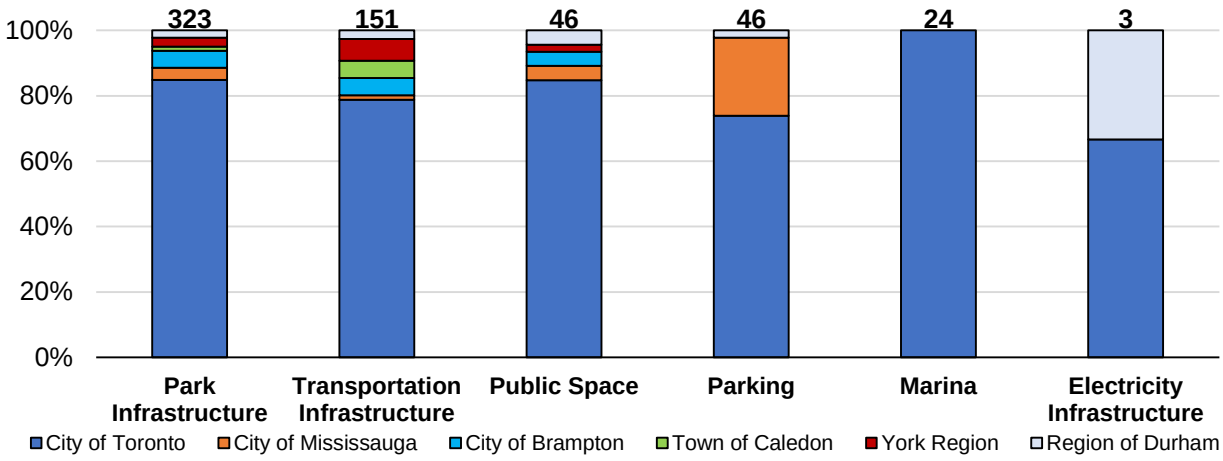


Figure 7.2 - Geographic distribution of the types of asset clusters protected by the erosion control systems.

7.5.4 Technical Level of Service

The ERMP is responsible for monitoring and maintaining the erosion control assets to ensure they provide an adequate customer level of service with limited funding. To ensure efficient monitoring and maintenance planning, ERMP staff inspect the parts of these erosion control systems. Inspections are based on a defined schedule determined by the parts' condition and any associated risk to public safety and essential infrastructure.

The goal of the ERMP is to keep 65% of TRCA's erosion control assets in 'Acceptable' condition to support the corporate LOS. Currently, approximately 89% of the erosion control systems are in 'acceptable' condition. This is the result of significant investment by the City of Toronto in the ERMP to support erosion hazard and slope instability remediation to protect their assets. Although only 10% of the erosion control systems need major maintenance and repair, this represents millions of dollars of publicly and privately owned assets at risk of erosion and slope instability. The protected asset clusters at risk due to the full or partial failure of the erosion control systems are summarized in

Table 7.4. This represents the percentage of all parts of the erosion control systems in need of minor repairs or major maintenance. This considers the fact that multiple parts of an erosion control system can inherently protect multiple types of publicly and privately-owned assets.

Table 7.4 - Percentage of all parts of erosion control systems requiring maintenance

Safety Consideration	Protected Asset Clusters	Assets Requiring Maintenance*
Essential Structures	Building	5%
	Underground Infrastructure	14%
	Transportation Infrastructure	13%
	Electricity Infrastructure	0%
Public Safety Concerns	Park Infrastructure	18%
	Parking	12%
	Marina	4%
	Public Spaces	2%

* Requiring major maintenance (excludes minor repairs)

As mentioned previously, the ERMP staff will work towards quantifying the exact extent of the risk for the protected asset clusters. This will help assess the intrinsic value that each erosion control system provides to other infrastructure and public safety. The current LOS of the erosion control systems is summarized in Table 7.5.

Table 7.5 - Summary of the technical LOS of the erosion control assets

Objective	Measure	Target Baseline	Performance	Trend
Mitigating hazard risks to communities and protecting the natural environment through functional erosion control systems	% of the erosion control systems in 'Acceptable' condition	65%	89%	

The selection of the target baseline acknowledges the inherent uncertainties of the future when it comes to climate change. It considers practical constraints, such as the expected decrease in funding for the maintenance of these assets and serves as a flexible starting point for ongoing adaptation in response to evolving circumstances.

7.6 Asset Management Strategy

The effective management of these unconventional assets can have tremendous consequences on safeguarding public safety, or property, along with savings for municipal and regional partners. While the ERMP is still focusing on the repairs of the backlogged assets damaged by the 2013 severe storm event and the recent 2017 and 2019 high lake levels on the shoreline, it is also focusing on innovating and implementing new methodologies and approaches to increase its efficiency to address depreciation and degradation of the erosion control assets.

With a significant backlog of systems past their useful life, the ERMP is focusing its strategy on more frequent maintenance of the erosion control systems through minor repair works. To support this strategy, the ERMP is currently in the process of developing the procedures and protocols for site assessment and prioritization, and the scheduling of minor works. This will allow TRCA to keep the erosion control assets in an 'acceptable' condition, hence extending the useful life of the assets and reducing the long-term expenses of major works and maintenance.

7.6.1 Operation

The ERMP is slowly shifting its strategy towards a more effective AMP through continuous maintenance, more efficient monitoring of its assets, and a more defensible, repeatable, and transparent maintenance priority assessment along with periodic life cycle costing analysis.

7.6.2 Asset Monitoring

TRCA's ERMP monitoring staff are equipped with a micro Remotely Piloted Aircraft System (mRPAS), the DJI Mini 2 (Figure 7.3), allowing for more efficient and safer inspections. It also provides the opportunity to safely capture a different vantage point of a site, providing insight when communicating erosion risk to various stakeholders, or when assessing the erosion risk (example: Erosion hazard at Boyd Conservation Area remediated in 2021 with a 75m long revetment HR123 (see Figure 7.6).

Figure 7.3 - Micro Remotely Piloted Aircraft System (mRPAS) (DJI Mini 2). Source: DJI, 2021.

Figure 7.4 - Former erosion hazard at Boyd Conservation Area captured by mRPAS before construction of a new erosion control system (before on the left photo, and after on the right photo). Source: TRCA, 2021.

7.6.3 Remote Sensing

Being more accessible and affordable than ever before, remote sensing provides the opportunity to get accurate models of erosion control systems and the surroundings. These models can then be used to inspect change over time and measure dimensions, and ultimately, assess risk. This is especially useful when dealing with ever-changing environments at the locations of the erosion control assets (i.e., valleys, watercourses, and shorelines).

Along with its improved monitoring techniques, the ERMP staff conduct scheduled and post-storm monitoring inspections on each of its assets depending on the level of risk and the corresponding inspection frequency. The post-storm monitoring leverages another type of remote sensor – the stream and rain gauges. The results of these inspections are used to determine if the systems are safe and to prioritize capital works to maintain these assets in an 'acceptable' condition.

TRCA's Remotely Piloted Aircraft System (RPAS) Program can collect video-based asset inspections. For more detailed assessment, the RPAS team can also quickly create photogrammetric models (Figure 5), providing the opportunity to measure dimensions and compare changes over time at a low cost. This approach is cheaper than RPAS light detection and ranging (LiDAR) data but does not penetrate vegetation.

Figure 5.7 - Photogrammetric model a waterfront system at the toe of Lakehurst Crescent (WF20). Source: TRCA, 2021.

The alternative to photogrammetry is to collect RPAS LiDAR data. It can penetrate vegetation to collect elevation data. This data can then be used to create a Digital Surface Model for observing changes on a site scale over time and assessing risk (

Figure 7.6).

Figure 7.6 - Two merged Digital Surface Models (collected by RPAS for land, and by multibeam echo sounding for underwater) of the erosion control system at Colonel Sam Smith (WF04). Source: TRCA, 2022.

7.7 Continual Improvement and Innovation

The operation and management of the erosion control systems are continuously evaluated and improved through clearly defined actions such as:

- Review of asset performance;
- Up to date inventories;
- Updates to asset information;
- The inclusion of unplanned corrective maintenance expenditures;
- Updates to preventative maintenance plans;
- Performance metric reviews;
- Return on Investment reviews (note again that ROI is a data gap in the program);
- Life Cycle Costing Index reviews; and
- Review of new trends and technologies.

The ERMP is currently improving their data collection, evaluation, and risk assessment for a more defensible, repeatable, and transparent methodology. In comparison to the current site assessment and evaluation methodology, this approach aims at connecting a site geospatially to each of the component parts of risk – hazard, exposure, and consequence of failure. This will result in a quantifiable score that can be derived from data linked to various internal and external databases in a GIS-based platform.

7.8 Financial Strategy

The ERMP has developed a plan to effectively manage and sustain its erosion control assets. The plan in conjunction with long-term financial planning will ensure that TRCA is managing erosion control systems in a manner that is fiscally responsible and sustainable over the long term. The key objective is to ensure that the ERMP has predictable investment in these structures to mitigate time-varying pressures such as aging, deterioration, and climate that affect the current state and the overall long-term performance of these assets.

This section provides a summary of the financial information presented as part of the individual asset category to have an overall understanding of the financial need of TRCA's erosion control assets. The financial data and future projections are based on the current asset inventory and condition information to date, focused on optimal asset lifecycle and value-based level of service, and summarized in the following sections:

- Historic Overview
- Predictable Investment
- Replacement Values and Unfunded Need
- Future Need
- Risks and Assumptions
- Importance of Full Life Cycle Costing.

TRCA's municipal partners have been proactive in providing a base level of dedicated funding to the

ERMP over a number of years while TRCA moves forward to asset management based on full lifecycle costing**Error! Reference source not found.**. This dedicated funding has provided the flexibility and liquidity required to finance current erosion control asset needs, as well as assist in addressing unfunded needs to mitigate new erosion hazards that arise from severe weather events.

Historic Overview

In order to understand the factors influencing TRCA's erosion control assets, an overview of the historical ERMP partnerships, and grants, is necessary. This helps explain how TRCA have been able to maintain their existing erosion control assets and build new ones, based on available funding. It also highlights major changes impacting on the condition of the erosion control systems (i.e., storms), and subsequently, an increase in funding from different municipal partners. The following presents a summary of TRCA's investment in erosion control infrastructure over the last 20 years:

2000 - Funding is relatively static up to 2006 at a total of approximately $2.0 million per year:

- $1.7 million for the City of Toronto, and
- $0.3 million for the Regions of York, Peel and Durham combined.

2006 - Region of Peel increases its funding for the ERMP by $600,000 per year for climate change mitigation and adaptation.

2011 - The ERMP gets funded $6.3 million by the City of Toronto, allowing the construction of 18 new assets in 2011 and 2012 through the *Shoreline and Valley Regeneration* portfolio.

2012 - Transition of the *Shoreline and Valley Regeneration* portfolio to:

- *Waterfront Major Maintenance and Remedial Works* portfolio (account 241-01) to address erosion hazard on Lake Ontario waterfront, and
- *Watershed and Valley Erosion Control* portfolio (account 134-01 and 139-01) which focuses on repairing deficient erosion control systems.

2013 - York Region increases its erosion funding to protect municipal water and wastewater infrastructure by $530,000 and then by $240,000 the following year for a total funding of $1.0 million in 2014.

2014 - City of Toronto increases its erosion funding by $50.0 million over 10 years in response to the severe weather event of July 8, 2013. A new program was created to address erosion and slope instability issues across the City of Toronto:

- *2014 Enhanced Erosion Major Maintenance* portfolio (account 133-01 and 133-03).

2019 - TRCA successfully obtains project approval under the Disaster Mitigation and Adaptation Fund (DMAF) that will contribute approximately $8.6 million per year over 10 years:

- $1.2 million for the 2014 Enhance Erosion Major Maintenance (133-01),
- $3.8 million for the Watershed and Valley Erosion Control (134-01 and 139-01)
- $1.9 million for the Erosion Maintenance Program with York Region (189-01), and
- $1.6 million for the Erosion Maintenance Projects with the Region of Peel (189-05).

Durham Region funding has been eliminated resulting in a monitoring and maintenance gap for 13 erosion control systems in Durham Region.

The available funding provided by each municipal partner to the ERMP for each specific program is illustrated in **Error! Reference source not found.**. It should be noted that not all these municipal programs directly fund erosion control assets maintenance. The funding provided by the City of Toronto through the *Watershed and Valley Erosion Control* portfolio and the *Waterfront Major Maintenance and Remedial Works* portfolio are directly focused on the maintenance of TRCA-owned erosion control assets. The other portfolios are more focused on the municipal partners' infrastructure at risk and *could* coincide with TRCA's failing/failed erosion control systems that put their infrastructure at risk, but not automatically.

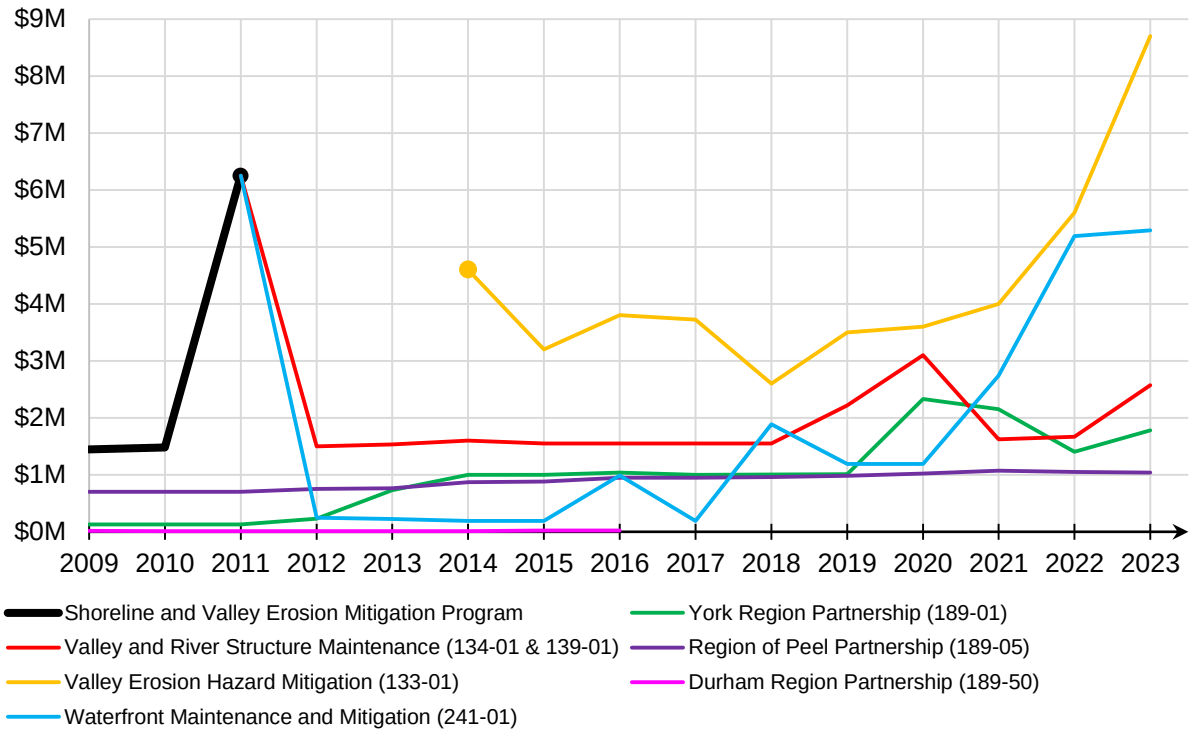


Figure 7.7 - Past funding for erosion hazard mitigation in TRCA's jurisdiction.

As highlighted previously, TRCA owns most of its erosion control assets within the City of Toronto. After the transition to the three core portfolios in the City of Toronto (2012) and the 2013 severe storm event, a total of 28 erosion control systems were built to address erosion and slope instability (see Figure 7.8 and Figure 7.9). For the same period, a total of 17 valley and river assets, and 8 waterfront assets, have been repaired and maintained to be brought into an 'acceptable' condition.

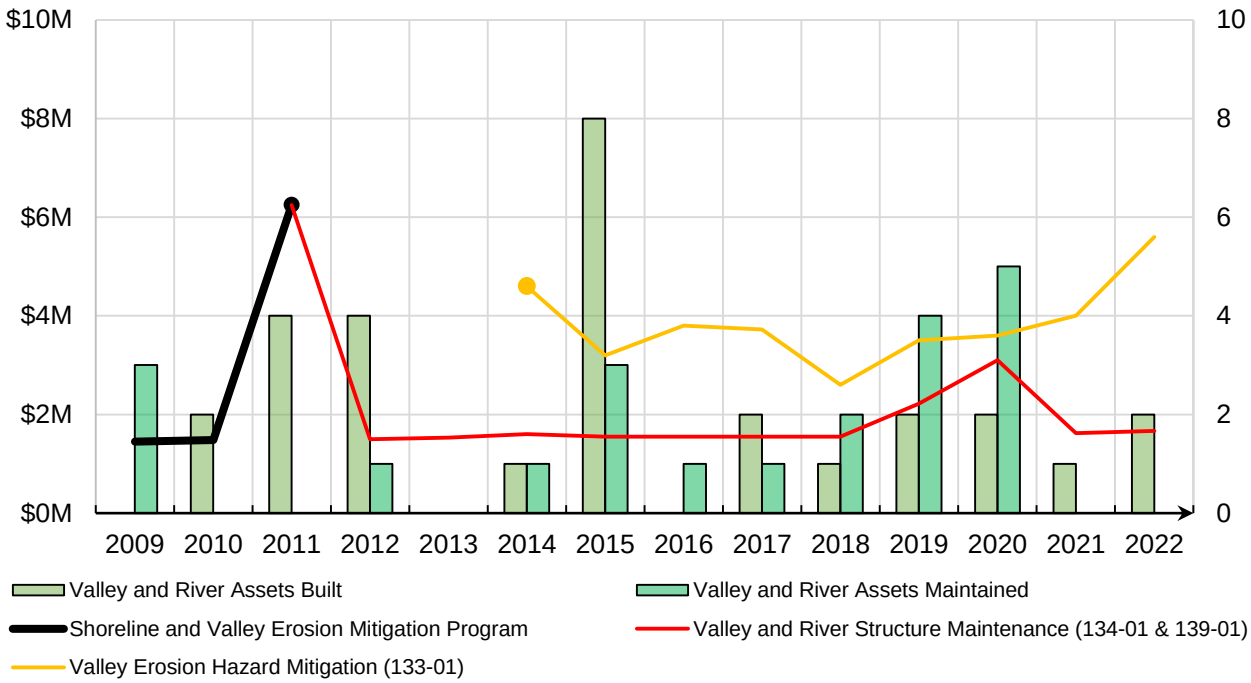


Figure 7.8 - Recently constructed and maintained valley and river assets in the City of Toronto.

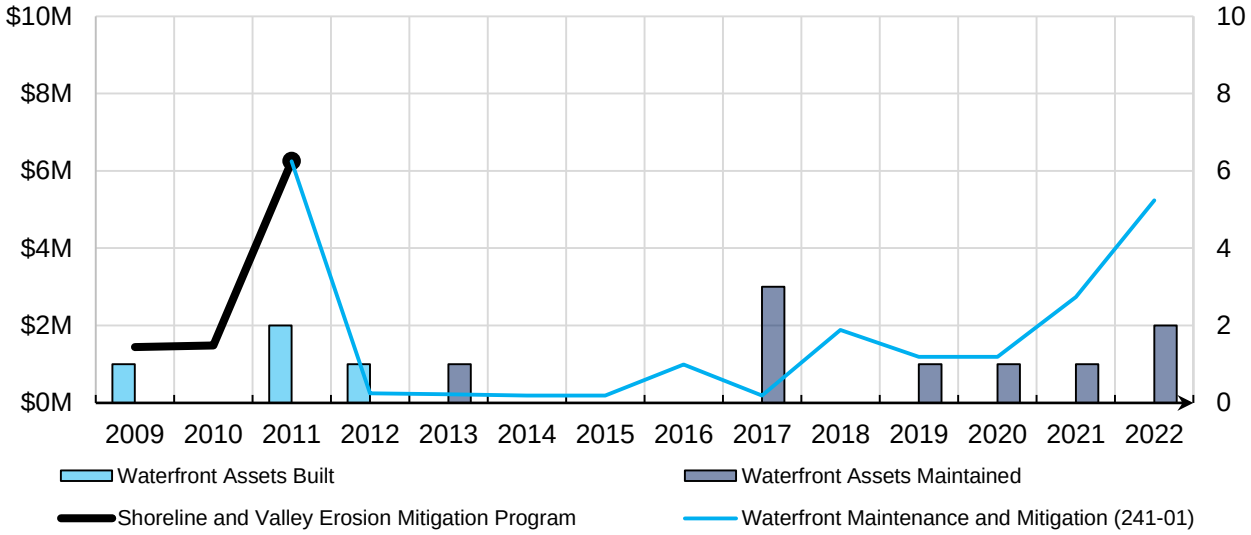


Figure 7.9 - Recently constructed and maintained waterfront assets in the City of Toronto.

Although a smaller portion of TRCA's erosion control system is located outside of the City of Toronto, a total of 22 assets were built recently (since 2009) (Figure 7.10). Compared to the City of Toronto's strategy that funded the repair and maintenance of 25 assets, the ERMP were only able to maintain 3 assets outside of Toronto for the same period.

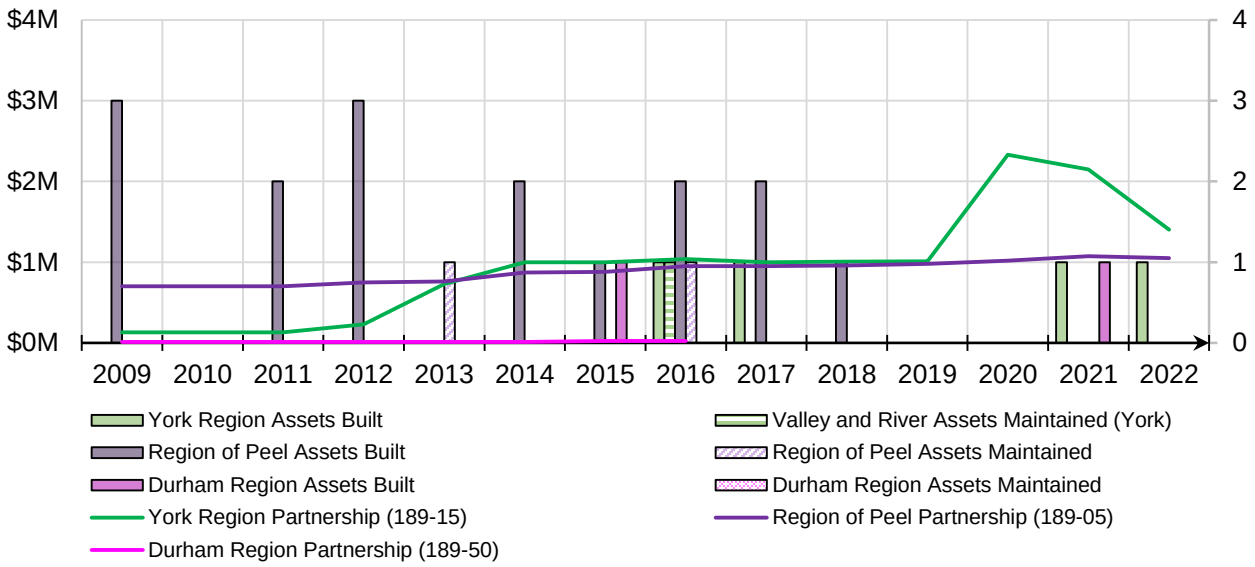


Figure 7.10 - Recently constructed and maintained assets outside of the City of Toronto.

Disaster Mitigation and Adaptation Fund (DMAF)

As part of the Disaster Mitigation and Adaptation Funds (DMAF), approved in March 2019 for the ERMP, Infrastructure Canada (INFC) agreed to contribute to TRCA not more than 40% of the total eligible expenditures up to a maximum of $22.3 million by the agreement end date of March 2028. This funding opportunity provides financial support to TRCA and its municipal partners to remediate erosion and slope instability across the valleys, rivers, and the waterfront throughout its jurisdiction.

Along with reporting and auditing, communicating with INFC, and indigenous consultations, TRCA must ensure the ongoing operation, maintenance and repair of any assets that were identified through this DMAF application during the Asset Disposal Period. The Asset Disposal Period represents 20 years after the effective substantial completion date. Therefore, TRCA needs to maintain ownership of the asset through land conveyance, including easements as required to access the structures for monitoring and maintenance. If land conveyance is not viable, access needs to be secured to maintain an asset for the duration of the Asset Disposal Period.

Fundamentally, this funding opportunity increases TRCA's ability to meet its core mandate to protect the public from the natural hazard of erosion and flooding. Despite having funding to remediate erosion and slope instability, TRCA's ERMP receives a larger percentage of funding to study and address erosion hazards rather than maintain existing erosion control infrastructure. The costs associated with maintenance and easement is negligeable on a site-by-site basis but will compound quickly. TRCA has a risk tolerance approach when it comes to its erosion control infrastructure ownership. When possible, this ownership is transferred through land conveyance to TRCA's municipal partners or private customers. This land conveyance of erosion control infrastructure removes TRCA's liability and places the maintenance and associated costs on the protected infrastructures' beneficiary. With this DMAF funding and the inclusion of the Asset Disposal Period, TRCA will increase its liability, without the financial means to monitor and maintain its erosion control infrastructures as needed; a fact that will eventually need to be addressed and managed accordingly.

The Long Branch Park waterfront erosion control infrastructure was the first assets TRCA's ERMP was able to substantially repair as part of the DMAF program in 2021 (Figure 7.11). This erosion control

system was repaired with a total eligible cost expenses of $1,560,100 to date, where TRCA will receive a total funding of $624,000 from INFC.

Figure 7.11 - post-construction maintenance of the waterfront erosion control system at Long Branch Park (WF03). Source: TRCA, 2021.

As TRCA continues to organize its data and more INFC funded maintenance projects are completed, the Asset Management Plan will be refined to identify the benefits of the DMAF and the potential challenges and funding needs over the Asset Disposal Period.

Forecasted Investment

The ERMP staff maintain a 10-year forecast for maintenance of TRCA's existing erosion control systems based on anticipated funding (**Error! Reference source not found.**) and site prioritization. In-year adjustments are expected and required given the dynamic and unpredictable nature of events that may trigger damage to these assets. These adjustments are required to adapt and respond to risk appropriately and maintain the expected service level to the highest degree possible. The ERMP assumes the status quo for the forecasted funding.

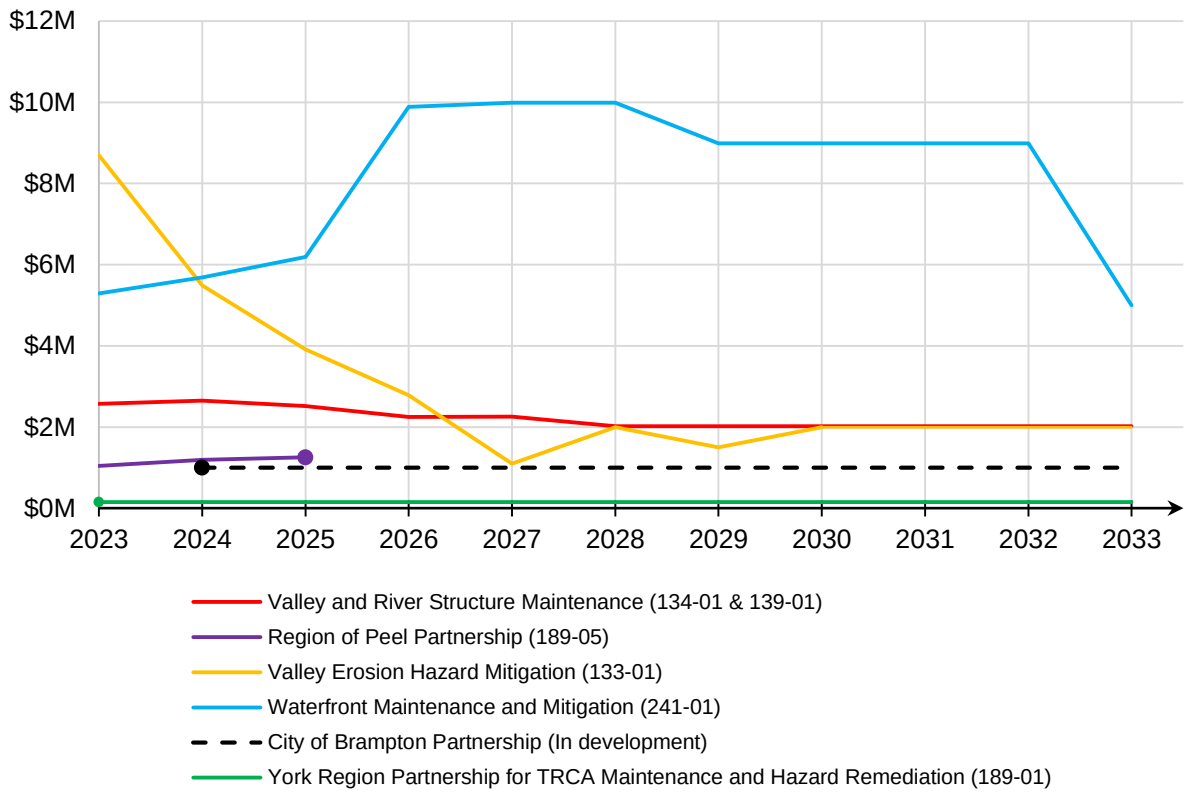


Figure 7.12 - Forecasted budget for the valley and river, and the waterfront, for erosion hazards remediation and erosion control systems maintenance across TRCA's jurisdiction.

While funding budgets for the remediation of valley and river erosion and slope instability hazards are peaking in 2023 through the *Valley Erosion Hazard Mitigation* portfolio (133-01) due to DMAF funding, the regional partnership for *TRCA Maintenance and Hazard Remediation* portfolio (189-01) will also provide minor support for the maintenance of valley and river erosion control systems in York Region. Alternatively, the *Waterfront Maintenance and Mitigation* portfolio (241-01) will focus on the repair of existing waterfront assets.

The regional partnerships with York Region and the Region of Peel are not expected to increase TRCA's erosion control asset inventory. This is because the regional partners assume ownership, and maintenance, of newly built structures since they ultimately protect their own linear buried assets: sanitary sewers, watermains, and stormwater infrastructure.

Additionally, the ERMP started to work with the City of Brampton in 2016 to inventory erosion hazards to public safety and essential infrastructure throughout the City within TRCA's jurisdiction. The ERMP is working towards a Service Letter Agreement for 2 years with the City of Brampton for monitoring services and remediation works to address erosion risks and keep the City's stormwater infrastructure functional. This will be the pilot for a longer-term agreement. Although this is not focused on TRCA's erosion control assets, TRCA owns 19 erosion control systems with a current replacement value of $7.7 million in the City of Brampton. Based on the proximity between TRCA's and the City's assets, this partnership could support the maintenance of TRCA's erosion control systems.

In the next 10 years, the ERMP will implement repairs and maintenance to 7 valley assets, 21 watercourse assets, and 12 waterfront assets as summarized in Figure 7.13. Given that some of these

maintenance projects take years to complete, the figure below only identifies the number of assets repaired at the expected year of substantial completion of the maintenance. With the current funding and grants, TRCA will be able to invest roughly $26 million in the maintenance of valley and river assets compared to $88 million for the waterfront assets, mainly in the City of Toronto.

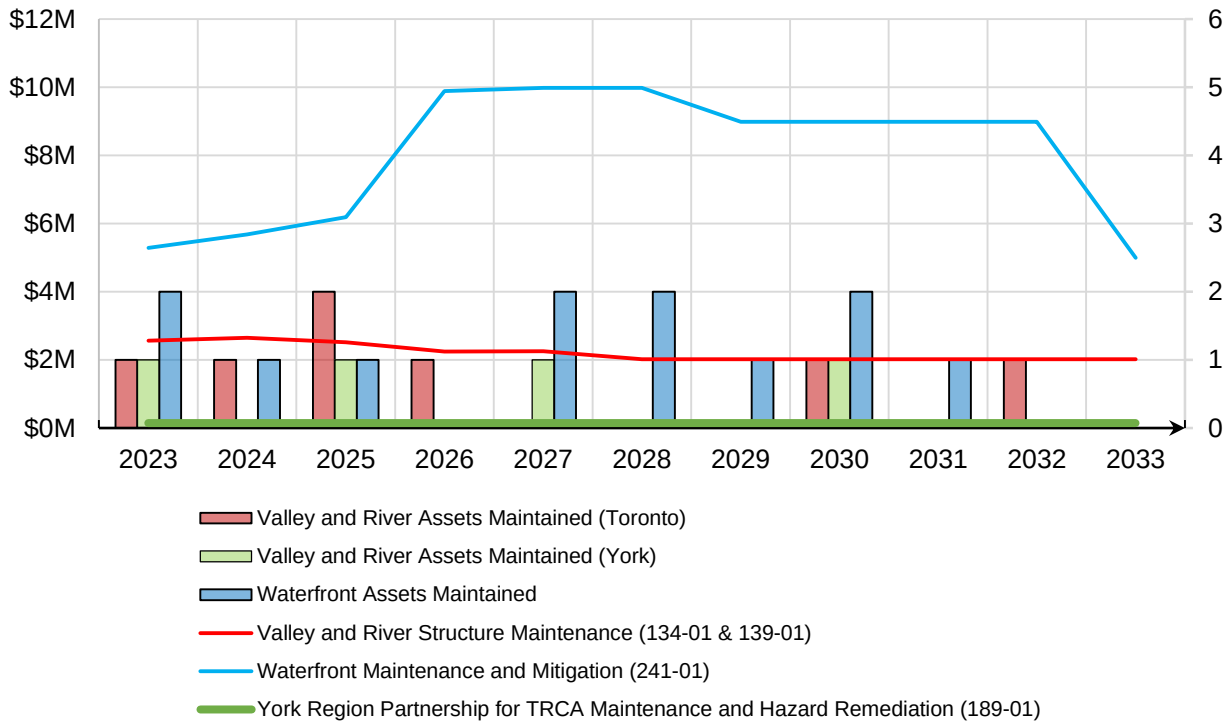


Figure 7.13 - Forecast maintenance of the erosion control systems over the next 10 years.

Unfunded Renewal Need

Maintaining TRCA's erosion control assets in an 'Acceptable' condition is identified in the ERMP's long-term financial plan, which seeks to optimize TRCA's investment in asset rehabilitation and replacement by strategically undertaking work on the right assets, at the right time. The assumed useful life of erosion control assets is set at 25 years to assign the scheduled replacement year, but it is the field assessed condition that provides the recommended replacement year. This step is critical to ensure that the primary goal of protecting life and property from the natural hazard of erosion and slope instability is always kept at the forefront of decision-making.

It is the objective of the asset management strategy to maintain or improve the LOS for erosion control assets. The current average condition of TRCA's erosion control assets is 'Good' with an overall average condition rating on the 5-point rating scale of 1.9 for the valley assets compared to 2.5 for the watercourse assets, and 2.6 for the waterfront assets. To keep improving and maintaining this level of performance, continued investment in the erosion control systems is required. The maintenance focus for these assets is to repair or replace all assets prior to failure, or by the end of its useful life whichever comes first; the former may occur sooner due to sustained damage from multiple storm events over time.

To track whether the LOS is being achieved, an annual SOGR Backlog Analysis of the erosion control assets is completed based on regional municipality, which aligns with how the ERMP is funded for the maintenance of existing erosion control assets and the construction of new erosion control assets. The annual SOGR Backlog Analysis tracks the scheduled repair/replacement year, as well as the recommended replacement year; the latter being updated annually and following weather events that have significantly changed the condition of the asset and overrides the scheduled replacement year.

As shown in Table 6, the average condition of erosion control assets across TRCA's jurisdiction is currently in 'Good' condition with an overall average ranking of 2.3. Approximately 89% of these assets are in 'acceptable' condition, which is above TRCA's goal of 65%. Most of the erosion control systems needing major maintenance are located in the City of Toronto's waterfront. Although parts of erosion control systems can be in 'Fair' condition, this type of asset can still be functioning as intended overall but might need repairs to prevent further erosion and displacement of other parts of the system.

Table 6.7 - Distribution of the current state of erosion control systems by municipality and estimated Rough Order of Magnitude (ROM) repair investment needed.

	Waterfront		Valley and River				
	City of Toronto		York Region	Region of Peel			Region of Durham
				Mississauga	Brampton	Caledon	
'Very Poor'	2%	1%	0%	0%	0%	0%	0%
'Poor'	22%	5%	3%	0%	0%	1%	3%
'Fair'	32%	25%	38%	9%	26%	3%	59%
Average Condition	2.3	2.3	2.5	2.2	2.6	2.1	2.2
Needed ROM Repair Cost* (in Millions)	$69.73	$23.10	$3.30	$1.79	$1.17	$0.13	$1.00
	$95.83		**$3.30**		**$3.09**		**$1.00**

* This includes the replacement value for 'Very Poor,' 'Poor,' and 'Fair' condition assets.

Based on current trends of the aging assets and considering the scheduled maintenance of TRCA's erosion control systems, Figure 7.14**Error! Reference source not found.** compiles the projected assets age distributed by volume in 2033 by municipality. Overall, 33% of all assets based on their size will be past their useful life. As previously demonstrated, there is a strong correlation between the age of the erosion control systems and their functional customer LOS.

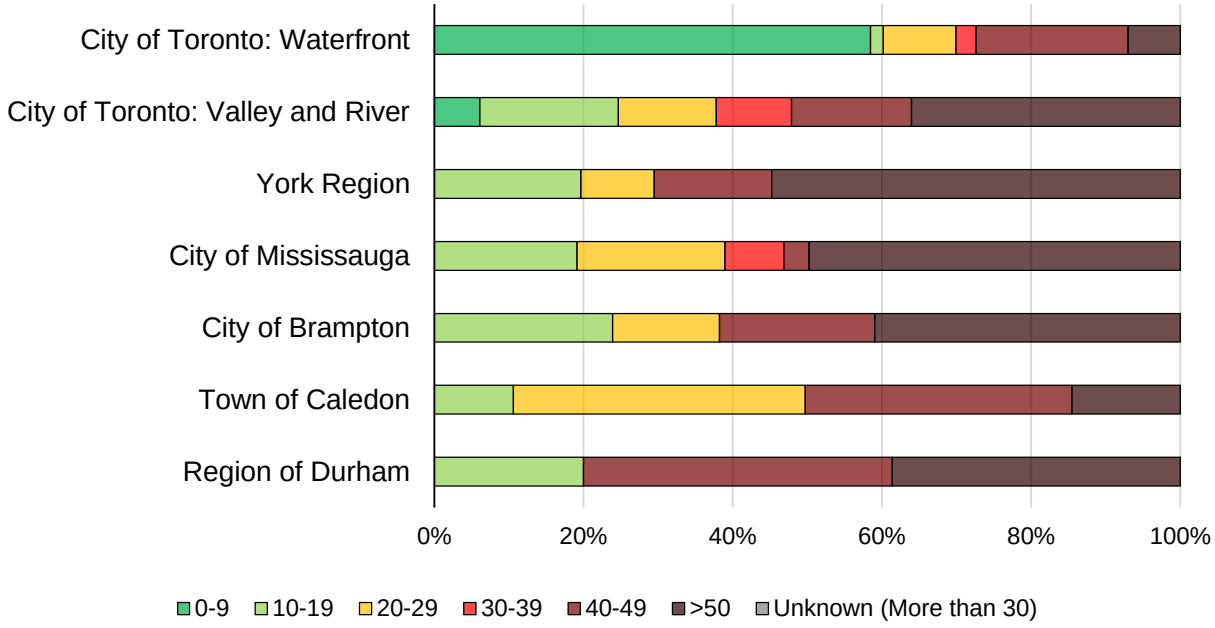


Figure 7.14 - Forecasted age (by 2033) of assets distributed by volume in the different municipalities.

With the current partnerships, the ERMP is expecting to increase the number of new erosion control systems by 31 in the next decade. This is supported by the partnership with City of Toronto for *Valley Erosion Hazard Mitigation* (133-01) portfolio in accordance with the updated *Private Landowner Contribution for Erosion Control Works* (Effective in 2022 – DSP-7.01-P). While details and agreements remain to be determined, most of these erosion and slope instability mitigation works will be implemented by land conveyance. To date, the rough order of magnitude of these projects is estimated to be $28.8 million.

As shown in Table 7.7, while funding for the maintenance of the valley and river systems might be enough to maintain the majority of TRCA's inventory in 'Acceptable' condition, a lack of funding will not allow an increase in the average condition rating of the structures. This means that although most of the structures will be in 'Acceptable' condition, most of the systems are still projected to be in 'Good' to 'Fair' condition.

Table 7.7 - Past and forecasted state of TRCA's erosion control systems*

Maintenance of Existing Assets		**2014 to 2022**	**2023 to 2033 (Forecast)**	**Change**
Valley and River	Maintained/Repaired (count)	19	24	**+ 5**
	Avg. Condition Rating	2.3	2.2	**- 0.1**
	Past 'Acceptable' Condition	11%	7%	**- 4%**
	Backlog Distribution	45%	49%	**+ 4%**
	Avg. Annual Budget (in millions)	$ 2.05	$ 2.60	**+ $ 0.55**

Maintenance of Existing Assets		2014 to 2022	2023 to 2033 (Forecast)	Change
	Total funding available (in millions)	$ 16.41	$ 26.01	**+ $ 9.60**
	Avg. Budget per Asset Volume	$ 55.20/m3	$ 77.95/m3	**+ $ 22.75/m3**
Waterfront	Maintained/Repaired (count)	6	12	**+6**
	Average Condition Rating	2.3	2.0	**- 0.3**
	Past 'Acceptable' Condition	12%	3%	**- 9%**
	Backlog Distribution	56%	38%	**- 18%**
	Avg. Annual Budget (in millions)	$ 1.72	$ 8.80	**+ $ 7.08**
	Total funding available (in millions)	$ 13.79	$ 87.98	**+ $ 81.23**
	Avg. Budget per Asset Volume	$ 4.09/m3	$ 26.17/m3	**+ $ 22.08/m3**

*Assuming no severe weather events or high lake level.

This forecast does not consider storm events, likely to increase in frequency due to climate change. The condition of TRCA's valley and river erosion control assets can easily decrease after a single event. For the waterfront systems, the majority of the funding increase will have positive impacts on the overall condition of these assets.

For the valley and river erosion control assets, the average annual funding per asset volume will increase by $22.75/$m^3$ in the next decade. Although this seems positive, this is mainly driven by the estimated 31 new assets that will be built as part of the *Valley Erosion Hazard Mitigation* portfolio (133-01). When newly built, these new structures are expected to be in 'Very Good' or 'Good' condition. With an average annual funding increase of $7.08 million, it is projected that the waterfront average overall condition rating will decrease significantly in the next 10 years.

With less than 10% of these assets past the 'acceptable' condition, the backlog distribution of should be noted with 49% of the Valley and River assets, and 38% of the Waterfront assets. These assets will be past their useful life of 25 years. These assets might not directly need major maintenance, but unpredictable factors, such as severe weather events and high lake levels, could make them more prone to failure.

Future Renewal Need

In Table 7.8, the forecasted maintenance is overall positive, but not optimal. An additional annual investment of approximately $1.44 million over the next 10 years for the valley and river erosion control assets would allow TRCA to slow down the overall degradation of its assets. Similarly, the waterfront assets would require an additional annual investment of $1.42 million. This would be the optimal

investment required to keep all these assets in 'acceptable' condition.

Table 7.8 - Forecasted and optimal state of the erosion control systems by 2033*

Maintenance of Existing Assets		Forecast	Optimal	Difference
Valley and River	Avg. Condition Rating	2.2	2.0	**-0.2**
	Past 'Acceptable' Condition	7%	0%	**-7%**
	Backlog Distribution	49%	43%	**-6%**
	Avg. Annual Budget (in millions)	$ 2.60	$ 4.04	**+ $ 1.44**
	Total funding available (in millions)	$ 26.01	$ 40.42	**+ $ 14.41**
	Avg. Budget per Asset Volume	$ 77.95/m^3	$ 119.61/m^3	**+ $ 41.65/m^3**
Waterfront	Avg. Condition Rating	2.0	2.0	**0.0**
	Past 'Acceptable' Condition	3%	0%	**- 3%**
	Backlog Distribution	38%	35%	**- 3%**
	Avg. Annual Budget (in millions)	$ 8.80	$ 10.22	**+ $ 1.42**
	Total funding available (in millions)	$ 87.98	$ 102.22	**+ $ 14.21**
	Avg. Budget per Asset Volume	$ 26.17/m^3	$ 30.41/m^3	**+ $ 4.24/m^3**

*Assuming no severe weather events or high lake level.

Even with this additional investment, 43% of the valley and river assets, and 35% of the waterfront assets, will be past their useful life. This creates a total of $218 million of assets more at risk of severe weather events and high lake levels, while also assuming that recently maintained assets have higher standards and can more robustly face the impact of climate change over the next decade.

7.9 Risks and Assumptions

This section of the asset management plan highlights all the current and foreseeable risks along with the assumptions made to forecast the future needs.

Risks

The AMP notes the following risks that can impact the timing and value of renewal needs:

- Weather
- Changes to LOS targets
- External Pressures
- Economic conditions
- Legislative requirements
- Modifications to assets from outside organizations or other R and I staff

Weather Impacts

Severe weather events can significantly impact the stability and lifespan of some erosion control structures. As an example, erosion control system MC02 was originally constructed as a gabion basket retaining wall in 1983 in Mimico Creek. The upstream portion of the retaining wall had failed and was replaced with armourstone in 2011. Toronto Water installed two vane/deflectors (not TRCA-owned assets) along the toe of the retaining wall as part of a larger channel restoration in 2012. The armourstone retaining wall constructed by TRCA was built to be more durable than the previous gabion basket retaining wall. During a severe weather event on July 8, 2013, large sections of the retaining wall were completely washed away leaving sections of the slope unprotected. TRCA performed maintenance work in 2020 to repair sections of the retaining wall.

Changes to LOS targets

The ERMP utilizes a technical LOS for prioritizing the construction, monitoring, and maintenance of erosion control assets. New sites in the form of major bank erosion along riverbanks or slope failures are continuously brought to TRCA's attention. As these sites are inspected and catalogued by the ERMP staff, this can impact on the timing of maintenance and renewal needs of existing assets. Some of the newly identified sites may be high profile or high risk, which may qualify them for emergency works and cause their remediation to take priority over older sites which require maintenance. The prioritization list is ever-changing as new sites are constantly added.

External Pressures

Some external pressures may change the timing of maintenance and renewal needs. This may come in the form of an erosion control system that is not currently rated on the ERMP's priority list, but external pressure has moved its maintenance to near the top of the priority list, or this pressure could add a

brand-new site to the ERMP's priority list. In both instances, this may alter timing and/or the value of the asset maintenance.

Legislative Requirements

Several legislative acts can potentially impact the timing of maintenance/renewal needs of erosion control systems. The construction timing for working in/near water, tied to the federal Fisheries Act and other provincial legislation such as the Environmental Assessment Act can impact the process, timing and extent of stakeholder and public consultation involved in securing approvals for construction. Another legislative act that can impact the timing is the Migratory Birds Convention Act, affecting when, and if, tree removals can occur.

Modifications to Assets from Outside Organizations

While it is an exception, outside organizations (e.g. municipal partners/contractors) have performed maintenance work on TRCA-owned assets without the knowledge of the ERMP. To ensure greater coordination going forward, TRCA staff are working with municipal partners (e.g. Toronto Water, Region of Peel, Region of York, City of Brampton) to share forecasted project work through geospatial information systems (GIS - i.e. maps). This shared knowledge provides an opportunity for TRCA and its municipal partners to efficiently remediate erosion vulnerable sites through collaborative erosion control asset implementation. For example, a collaborative reach-based approach where numerous vulnerable assets owned by various stakeholders could be protected with a larger erosion control project than any one municipal partner had planned on implementing.

Assumptions

The following are assumptions made throughout this report when compiling data for the AMP:

- The replacement value of the erosion control systems and their repairs was inflated over time. Stats Canada's Building Construction Price Index (BCPI) for Non-Residential Buildings in the City of Toronto was used between 1981 and 2023. Since the BCPI only starts in 1981, Stats Canada's annual average national Consumer Price Index (CPI) was used prior 1981.
- For any projection and forecasted replacement value, an average inflation rate of 3% was used between 2024 and 2033;
- Replacement values and plan assumes like-for-like with no expansion of the asset or major change in material type;
- Replacement cost includes planning, permits/approval, legal, construction, post-construction monitoring, and other miscellaneous costs;
- Asset replacement value does not consider the value of the asset it is protecting;
- Essential assets that TRCA's erosion control systems protect have not been thoroughly reviewed, therefore, it can be assumed that the customer LOS performance measures are potentially larger than reported;
- The projected number of new assets that will be constructed in the next 10 years is based on the average number of assets constructed per new projects as part of the Valley Erosion Hazard Mitigation portfolio (133-01). It is also based on currently known facts aligning with the Private Landowner Contribution for Erosion Control Works (Effective in 2022 – DSP-7.01-P);

- The asset condition rating uses the most recent erosion control system inspection data, maintenance data, or newly constructed data at the time the report was prepared (prior to July 2023); and

7.10 Importance of Full Life Cycle Costing

Life cycle costs should include all costs that are anticipated to occur during the ownership of an asset. This includes capital, operating and maintenance, and disposal expenditures. Unless these full life cycle costs are defined, it is difficult to effectively plan for complete infrastructure costs going forward. Once these expenditures are further understood, TRCA can utilize cost-effective management strategies by repairing or replacing the right assets at the optimal time. TRCA is working to better understand both the type and timing of treatments that lead to optimal infrastructure management. It is important that TRCA continues to analyze projects and manage existing assets based on full and optimal life cycle costing. This will ensure that current and future infrastructure will have sufficient funds available when needed. Plans for the ongoing improvement of information quality and the planning process will be an integral part of TRCA's Asset Management system going forward.

Flood Control Infrastructure

SECTION 8: FLOOD CONTROL INFRASTRUCTURE

Introduction

TRCA owns 29 flood control structures across its jurisdiction, comprised of dams, dikes, flood control channels, and two flood control walls. Given the highly urbanized area within TRCA's jurisdiction, it is critical to maintain this infrastructure to ensure public safety concerns are addressed. Through a more traditional Asset Management Plan (AMP) approach, the flood control infrastructure owned by TRCA is reported on through four components:

- Asset inventory
- Levels of service
- Asset management strategy
- Financial strategy

This AMP describes the four components for TRCA's flood control structures, and the strategies employed by TRCA to manage the inventory of aging, critical infrastructure. This AMP is a first attempt at quantifying the management needs to ensure TRCA's flood infrastructure inventory is operating at an acceptable and safe level. It is expected that this AMP will advance and expand as additional data is obtained.

State of TRCA'S Flood Infrastructure and Hydrometric Networks

The purpose of this report is to document the current state of repair of TRCA-owned flood infrastructure and hydrometric networks to outline the major capital improvement projects that have been implemented or that are required in the future. Information on the process of identifying projects, funding sources, and the regulatory framework for dam safety in Ontario is also included in this report.

Pillar 1, Environmental Protection and Hazard Management, of TRCA's 2023-2034 Strategic Plan outlines TRCA's objectives to mitigate known flood risks, which includes the operation, maintenance, and surveillance of flood infrastructure. Additionally, Conservation Authorities are mandated, under Section 21 of the *Conservation Authorities Act*, to ensure conservation, restoration, and responsible management of Ontario's water resources. Specifically, Section 21 empowers Conservation Authorities to:

- Erect works and structures and create reservoirs by the construction of dams or otherwise.
- Control the flow of surface waters in order to prevent floods or pollution or to reduce adverse effects thereof.

As part of this mandate, TRCA develops and maintains programs to prevent loss of life and property damage from flooding hazards. Where appropriate, this includes structural flood mitigation alternatives. TRCA has constructed various flood control structures to reduce flood risk in Flood Vulnerable Clusters (FVCs). The majority of TRCA's flood infrastructure was built between the late 1950's and the early 1980's as part of the flood mitigation response to the Hurricane Hazel flood of 1954. TRCA has also inherited infrastructure that controls or retains water through various land acquisition programs and transactions. For the purpose of this report, flood infrastructure refers to TRCA owned dams, channel, and dikes (TRCA's single flood wall is grouped under the dike category for simplicity). A general location

map of all TRCA flood infrastructure is presented in Figure 8.1.

TRCA's channels, berms and other structures are also experiencing some deterioration. For example, some TRCA channels have reduced flood capacity due to the accumulation of sediment, establishment of vegetation, failed concrete panels and erosion of channel banks. These structures were built between the 1950's and 1980's and the design life of these types of structures is typically around 50 years and some structures need some major repairs to extend their functional life.

In addition to the flood control structures that are documented in this report, TRCA's hydrometric network systems are also included. This is because TRCA's Hydrometric Program is managed under the Flood Infrastructure and Hydrometric business unit. TRCA's Hydrometric Program is comprised of large networks of stream gauges, precipitation gauges and climate stations that contribute data to the Flood Risk Management Program. The hydrometric network provides data to support flood forecasting and warning, dam operations, emergency management, infrastructure design and floodplain mapping. The hydrometric network is comprised of a large amount of specialized hardware and instrumentation and will benefit from the asset management process as this equipment has a finite life cycle and will require ongoing repairs, upgrades, and replacement to remain in a state of good repair.

To obtain an overview of TRCA's current state of Flood Control Infrastructure assets, the asset inventory, valuation, age, and condition were documented for the following asset categories:

- Dams
- Channels
- Dikes and Flood Walls
- Hydrometric Equipment

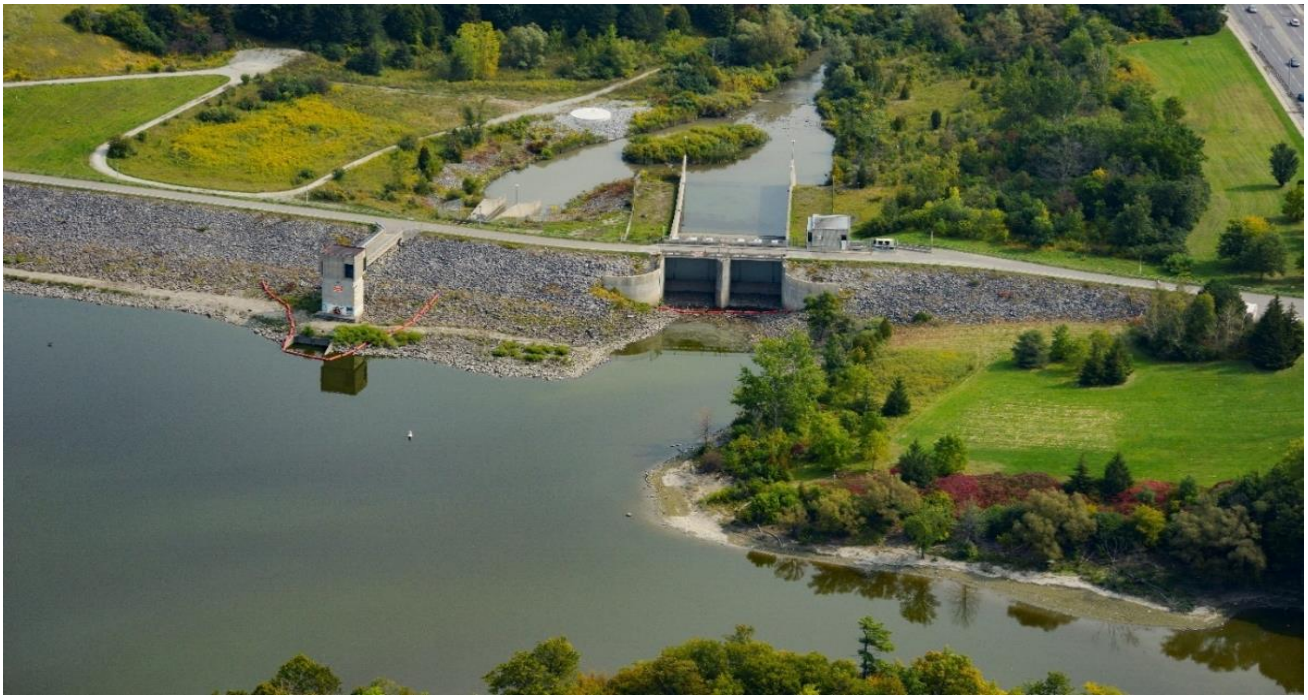
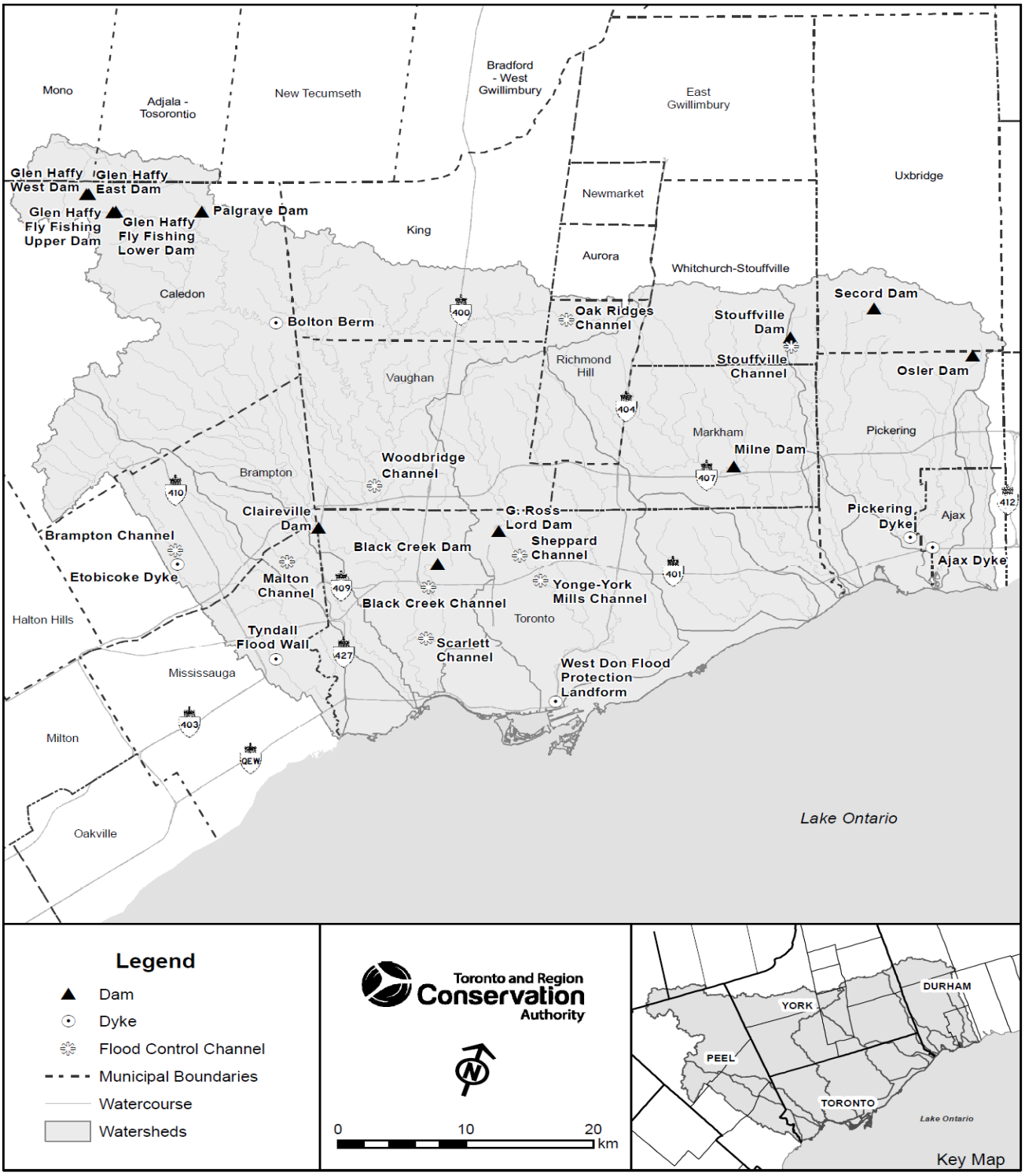


Figure 8.1 - Location of TRCA owned flood infrastructure including dams, dikes, and flood control channels



8.1 Asset Data Inventory

8.1.1 Structures and Equipment

The dams, dikes and channels assets included in the AMP make up the largest portion of TRCA's assets in terms of financial value and represent the greatest area of risk to public safety.

TRCA's dam inventory consists of 12 dams of which five provide flood protection. The other dams are historical mill and industrial dams acquired through land acquisitions. Also, TRCA has 17 flood control structures that include channels, dikes, and flood walls. The information below summarizes the dams, channels and other flood control assets inventory that are included in this AMP.

8.1.2 Dams

TRCA owns and operates several large and small dams and flood control structures. The two large dams are G. Ross Lord dam and Claireville Dam, located in the Don River watershed and in the Humber River watershed, respectively. These dams are actively operated structures, and their operational procedures are integrated with TRCA Flood Forecasting and Warning program. In addition to the 2 large dams, TRCA currently owns 10 small dams, and 15 flood control structures that include channels, dikes, and flood walls.

TRCA's dam inventory consists of 12 dams, of which 5 were specifically built to provide flood protection. The other dams are historical mill, recreational, and industrial dams acquired through various TRCA land acquisition programs. TRCA's dams' range in age between 45-85 years old and most require major capital improvements in order to meet current dam safety guidelines. A list of TRCA-owned dams is included in Table 8.1.

Over the past several years, there have been several high-profile dam safety incidents around the world that have resulted in loss of life, mass evacuation and population displacement, environmental damage, and extensive property damage. The consequences of dam failures illustrated by these incidents underscore the importance of having a robust dam maintenance program at TRCA.

TRCA Flood Control Dams

The G. Ross Lord Dam was constructed in 1973 and is an earthen embankment dam that was built based on a US Army Corps of Engineers Design. It consists of an upstream sloping impervious core, upstream riprap over filter layers, and a downstream grassed slope. There are two concrete spillways: low level outlets for controlling floods and the emergency spillway for preventing the dam from overtopping during flood events. The reservoir has a maximum storage volume of 5,500,000 m3. The two low level gates are used to operate the dam and maintain the upstream levels in the reservoir. For controlling higher flows, there are two radial gates, which discharge to a concrete spillway, however these have never been used to control flow through the dam. The G. Ross Lord Dam has been classified as a Large Dam and with a Very High Hazard Potential Classification (HPC). The G. Ross Lord Dam is located on the West Don River. The downstream watershed has several high-profile flood-prone areas; therefore, the proper operations and maintenance of the dam is of critical importance to TRCA. It is estimated that if G. Ross Lord Dam experiences a failure during flood conditions, that over 3200 persons would be at risk and over $1.3 billion in property damage would be expected.

Figure 8.2 - G. Ross Lord Dam Emergency Spillway

The Claireville Dam was constructed in 1963-1964. It consists of a concrete spillway, which is flanked on both sides by an earth embankment of homogeneous construction. The dam has a height of 15 m. The ogee type concrete spillway is controlled by five radial gates discharging into a concrete stilling basin. The spillway and stilling basin are 'anchored' to bedrock. The reservoir has a maximum storage volume of 4,700,000 m3. There are four low-level discharge pipes installed between the five gates within each of the four piers.

Due to its height and reservoir capacity, Claireville Dam is classified as a "Large Dam." It has an HPC of Very High due to potential downstream impacts in the event of dam failure.

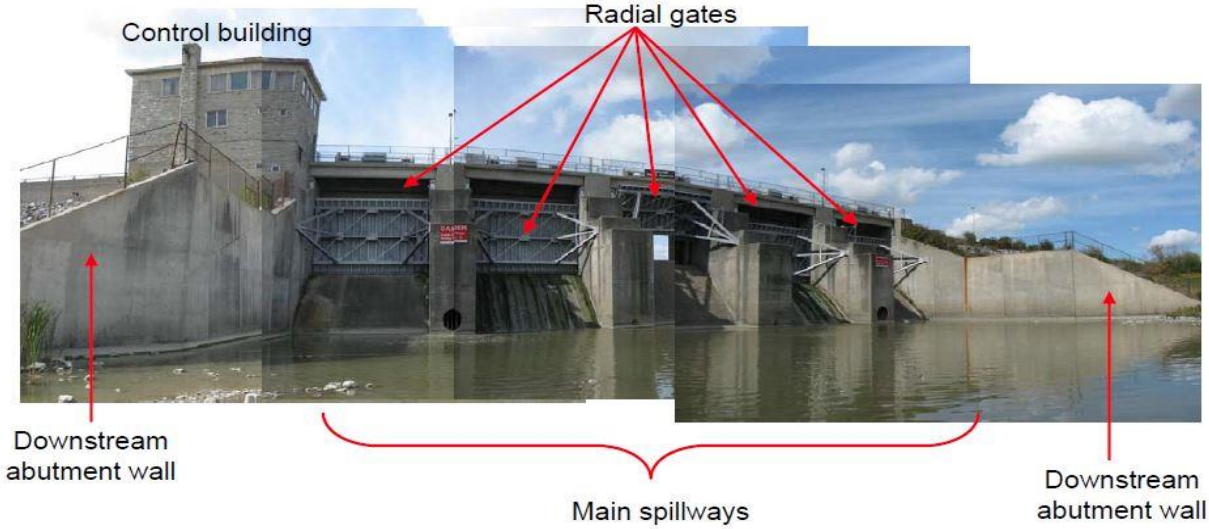


Figure 8.3 – Claireville Dam

The Stouffville Dam was constructed in 1969 to reduce the risk of flooding in the Town of Whitchurch-Stouffville. The dam is an earth embankment structure with a concrete drop spillway that discharges flow through the dam via a box culvert. Stouffville Dam has an HPC of Very High due to potential downstream impacts in the event of dam failure.

Milne Dam is located in the City of Markham. The dam is an earth embankment with a concrete ogee-type spillway. The dam has a small gate to lower the reservoir for maintenance. The dam replaced an older dam upstream that was severely damaged during Hurricane Hazel. Secondary uses include regulating summer flow and recreational purposes.

Black Creek Dam is located in Black Creek Humber upstream of the river crossing of Jane Street, south of Sheppard Ave. The Dam was constructed in 1960 for flood control in reducing downstream flows and velocities in the Black Creek and Scarlett Flood Control Channels. The dam is a rock check dam with corrugated steel pipe for controlling flows.

TRCA Small Dams

Palgrave Dam was originally constructed in the 1850s and was restored in 1983 after TRCA acquired it in 1979. The construction of the dam led to the creation of Palgrave Pond. This dam is no longer in operation as a mill dam.

Secord Dam was originally constructed to provide hydro power to a sawmill operated until the 1950s. The dam provides no flood protection. The reservoir is used for recreational purposes.

Glen Haffy Conservation Area contains four dams located on the Humber River and Centreville Creek headwaters. Glen Haffy West and East Dams were constructed to create two small trout ponds downstream of the Glen Haffy Conservation Park fish hatchery. The ponds are stocked with rainbow trout and are a popular fishing destination. The Glen Haffy Upper Dam and Lower Dam are located of Centreville Creek and also stocked with fish for recreational purposes.

Osler Dam was built in 1934. TRCA purchased the property in 1991. The dam was not designed for flood protection.

Table 8.1 – TRCA Dams

Dam Name	Watercourse	Region	Dam Purpose	Unit
G. Ross Lord Dam	West Don River	City of Toronto	Flood Control	Each
Claireville Dam	West Humber River	Peel Region	Flood Control	Each
Stouffville Dam	Stouffville Creek	York Region	Flood Control	Each
Milne Dam	Rouge River	York Region	Flood Control	Each
Black Creek Dam	Black Creek	City of Toronto	Flood Control	Each
Palgrave Dam	Humber River	Peel Region	Recreation	Each
Secord Dam	West Duffins Creek	Durham Region	Recreation	Each
Osler Dam	East Duffins Creek	Durham Region	Recreation	Each
Glen Haffy Dam West	Humber River	Peel Region	Recreation	Each

Dam Name	Watercourse	Region	Dam Purpose	Unit
Glen Haffy Dam East	Humber River	Peel Region	Recreation	Each
Glen Haffy Upper Dam	Centreville Creek	Peel Region	Recreation	Each
Glen Haffy Lower Dam	Centreville Creek	Peel Region	Recreation	Each

8.1.3 Flood Control Channels

Flood control channels are designed to increase the amount of flow that can be conveyed through a watercourse reach. Flood control channels are created by replacing the natural watercourse with an engineered channel. Flood conveyance is increased by lining the channel with concrete or stone to reduce resistance to the flow of water. Flood control channels often straighten the watercourse to increase flow conveyance. Flood control channels are extremely damaging to the natural processes of a river and are only used as a last option for reducing flood risk. Because they do not retain water, flood control channels are a less-risky flood control structure type, because a failure of a channel does not cause an uncontrolled release of water, unlike a dam or dike.

TRCA's flood control channels were built in communities with historic flood risk. These communities were built prior to the existence of TRCA's regulations on limiting development in the floodplain. TRCA owns 9 flood control channels totaling approximately 11.5km. Of this, 8.5km is of concrete trapezoidal design and the remaining channel types are a mixture of rip rap and gabion basket design. A list of TRCA's flood control channels is provided in Table 8.2.

TRCA Flood control channels

Are usually large dry concrete channels that run below the street levels in our city, so that if and when a flood occurs, the water will run into these channels, and eventually drain into a river.

Yonge York Mills Channel was constructed to provide flood protection for the community of Hoggs Hollow in conjunction with the G. Ross Lord Dam and reservoir.

Woodbridge Channel was designed to decrease erosion and provide storm water conveyance through the Woodbridge flood plain lands.

Stouffville Channel was constructed in conjunction with the Stouffville Dam to provide 100-year flood protection to the Town of Stouffville.

Black Creek Channel was designed to provide protection for public utilities against erosion and provide flood water conveyance of Black Creek.

Scarlett Channel was designed to provide protection for public utilities against erosion and provide flood water conveyance of Black Creek through Alliance Road and the Humberlea Corridor.

Brampton Channel was designed to provide protection from 100-year flood flows in downtown Brampton (1% chance of occurring in a given year).

Sheppard Channel was originally designed to facilitate the construction of the Sheppard Avenue bridge and provide some flood relief to the residents adjacent to Don River Boulevard.

Mimico Malton Channel was designed to prevent flooding of commercial and residential development within the flood plain in the Malton area.

Oak Ridges Channel was designed to prevent flooding of residential development within the flood plain in King City.

Bolton Channel was constructed as a diversion channel for high flows and helps the Bolton Dike achieve 350-year flood protection.

Table 8.2 – TRCA Flood Control Channels

8.1.4 Dikes

Channel Name	Watercourse	Channel Purpose	Channel Type	Channel Length
Yonge York Mills Channel	West Don River	Flood Control	Concrete Trapezoidal/ Gabion Trapezoidal	1670m
Woodbridge Channel	East Humber River	Flood Control	Rip Rap	1850m
Stouffville Channel	Stouffville Creek	Flood Control	Gabion Basket	370m
Black Creek Channel	Black Creek	Flood Control	Concrete Trapezoidal	2370m
Scarlett Channel	Black Creek	Flood Control	Concrete Trapezoidal	3600m
Brampton Channel	Humber River	Flood Control	Concrete Trapezoidal	570m
Sheppard Channel	West Don River	Flood Control/Erosion Control	Gabion Basket	350m
Mimico/Malton Channel	Mimico Creek	Flood Control	Gabion Trapezoidal	650m
Oak Ridges Channel	East Humber River	Flood Control	Gabion Basket	90m
Bolton Channel	Humber River	Flood Control	Rip Rap	80m

Dikes, sometimes also called berms or levees, are defined as an embankment built to control or hold back water. Dikes are typically built parallel to a river to prevent water from entering developed areas. Like dams, dikes hold back water during periods of high flows, however dikes are not considered dams under definitions provided by various dam safety and regulatory agencies. Included in this category is the Tyndall Flood Wall and the Bolton Flood Wall. The Tyndall Flood Wall is a masonry concrete wall and is not an earthen embankment structure like the other dikes. It is included in this category because it functions like a dike during periods of high water. The Bolton Flood Wall is a structural retaining wall

that allows increased flow though the oxbow restriction as part of the Bolton flood protection system.

Dikes are primarily earthen embankment structures, although one structure owned by TRCA was constructed as a masonry wall**.** Dikes, like dams, carry more risk than channels because a dike failure during a flood would create a situation where there would be an uncontrolled release of water into the area protected by the dike. TRCA owns 6 dikes totaling approximately 3.6km. A list of TRCA's Dikes is provided in Table 8.3.

Table 8.3 – TRCA Dikes

Dike Name	Watercourse	Dike Purpose	Dike Length
Pickering Dike	Duffins Creek	Flood Control	1250m
Ajax Dike	Duffins Creek	Flood Control	350m
Bolton Dike	Humber River	Flood Control	800m
Etobicoke Dike	Etobicoke Creek	Flood Control	460m
Flood Protection Landform	Don River	Flood Control	710m
Tyndall Flood Wall (masonry flood control wall)	Little Etobicoke Creek	Flood Control	80m
Bolton Flood Wall	Humber River	Flood Control/Erosion Control	50m

8.1.5 Hydrometric Network

TRCA owns and operates a network of stream gauges, precipitation gauges and climate stations to provide data to support flood forecasting and warning, dam operations, emergency management, infrastructure design and floodplain mapping. The hydrometric network is included in the flood infrastructure portfolio because often the hydrometric assets are located on or near existing dams, dikes, or channels. The hydrometric networks are located throughout TRCA's jurisdiction. They include telemetered stations that provide real-time hydrometric data to TRCA and remote stations that require monthly visits to download data. The hydrometric network is comprised of a large amount of specialized hardware and instrumentation that includes sensors, data loggers, telemetry equipment, power systems, and enclosures. TRCA's hydrometric network by station type is presented in Table 8.4.

Table 8.4 - TRCA Hydrometric Equipment

Hydrometric Equipment Type	Number
Real-time Stream Gauges	27
Real-time Precipitation Gauges	26
Stand-alone Stream Gauges	28

Hydrometric Equipment Type	Number
Stand-alone Precipitation Gauges	16
Climate Station	5

Figure 8.4 - Old Mill at Humber River Real-time Stream Gauge

8.2 Asset Valuation

To proactively manage assets through their full life cycle, estimated replacement costs are calculated to ensure appropriate funds are being set aside to fund the future rehabilitation and replacement of assets as needed. Replacement values are calculated using data from Stats Canada – Using the Non-Residential construction price index to approximate the replacement value for flood and erosion control infrastructure as of Q1 1981. Replacement values do not account for major expansions, and do not include costs associated with potential environmental assessments, land acquisitions or significant provincial or federal permits that may be required as a result of a major expansion in the footprint or function of the asset.

Replacement Values are used as the basis to estimate the cost of replacing an asset when it reaches the end of its engineered design life. The total replacement value of the dams and channels included in this Plan is **$167,531,298** and **$30,215,207** for other flood control assets for a total of **$197,746,505** (calculated to Q4, 2023). The total replacement value of all assets covered under this plan is illustrated in Table 8.5 below. Replacement costs are calculated by converting the original cost of the structure to

current prices using the Bank of Canada inflation index. For example, a dam costing $100,000 in 1960 would have a replacement cost of $875,159.24 in today's dollars. However, replacement cost should not be used as an indicator of the actual cost of rebuilding the structure. This is because engineering standards have evolved substantially since the majority of TRCA flood infrastructure was built. It would be expected that reconstructing a dam or similar structure would require significantly more design work and complex construction to meet current industry standards. The result would be much higher costs.

Further complicating the issue of replacement cost is that records available from the original construction are incomplete and/or unclear. It is difficult, and in many cases impossible, to break out exact construction costs. Non-construction costs such as engineering design and property acquisition are not itemized in the available documentation. Also, the regulatory framework that owners of flood infrastructure have today were not in place in the 1960's and 1970's and line items that would be required to construct a dam today such as habitat compensation and dewatering would not have been required in the past. This can skew replacement cost calculations.

Replacement Cost Valuation, there are three basic methods to estimate replacement costs needed for infrastructure renewal planning:

1. Local price indices: This is the most accurate method. TRCA has collected recent acquisition data demonstrating similar replacement activities. Since TRCA has not built new flood infrastructure since the 1980's, this method is not used in this report.
2. Published price indices: Where local indices are not available, TRCA uses published indices. This method is not used in this report.
3. Accounting estimates: When assets cannot be estimated against either index, TRCA uses accounting methodology based on historic cost, estimated useful life and inflationary effects to determine replacement value. The majority of structures valuations were calculated using original construction cost and, using the Bank of Canada Inflation Calculator, updated to reflect today's valuation.

Table 8.5 – Inventory & Replacement Values

Service	Asset		Inventory	Unit	Replacement Value (2023)
Flood Control	Dams	Flood Control Dams	5	Each	$99,328,934
		Recreation Dams	7	Each	$7,213,544
	Channels	Flood Control Channels	11,520	Meters	$60,988,820
	Dike	Flood Control	3,570	Meters	$28,548,641
	Flood Wall	Flood Control Wall	2	Each	$504,538
	Hydrometric Equipment		102	Each	$1,162,028
TOTAL					**$197,746,505**

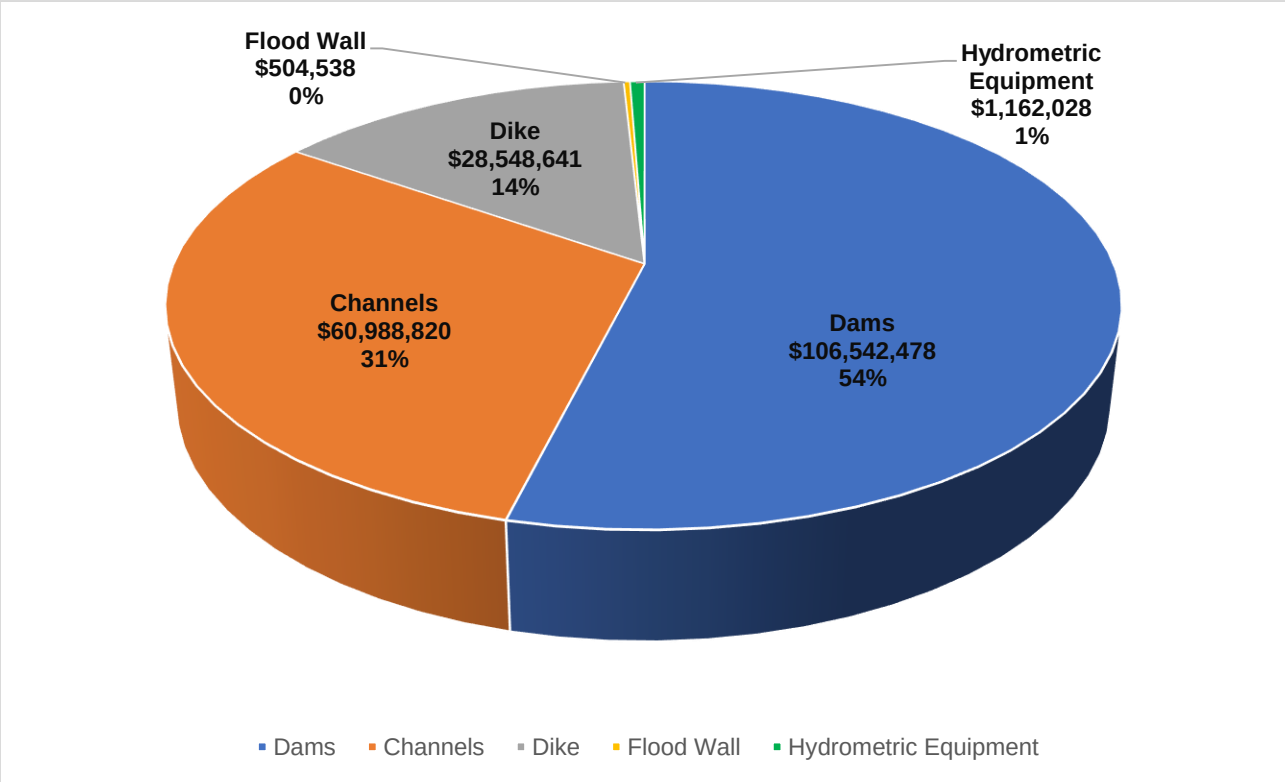


Figure 8.15 - Asset valuation by structure category

8.3 Asset Useful Life

Asset useful life for flood infrastructure components varies greatly depending on the type of asset. Earthen embankment components of a dam may have a design life of >100 years but the concrete structure of the dam may only have a 50-year expected useful life. Dikes would have a similar lifespan as an earth embankment dam, but a flood control channel may only have a 50-year expected useful life. Using the asset useful life and acquisition cost, depreciation can be calculated for a structure.

Table 8.6 – Asset Useful Life for Flood Infrastructure

System/Component	Service/Design Life
Dam – Reservoir[1]	Indefinite
Dam – Spillway Structures[1]	80 Years
Dam – Mechanical Systems[1]	50 Years
Dam – Embankment[1]	100 Years
Dam – Drainage/Pressure Relief[1]	50 Years
Dam – Power Supply (Grid System and Emergency Back-Up Power Systems)[1]	30 Years
Dam – Control and Monitoring Systems[1]	20 Years
Flood Control Channel – (Rip Rap and Concrete)[2]	50 Years
Dike – Embankment[1]	100 Years
Flood Control Wall – (Masonry)[2]	50 Years
Hydrometric Equipment (Hardware, Instrumentation)	10 Years
[1]Electric Power Research Institute, Hydropower Plant Modernization Guide, 1989 [2]Manitoba Infrastructure and Transportation, Water Control Structures Design Manual, 2011 (extrapolated from bridge design criteria)	

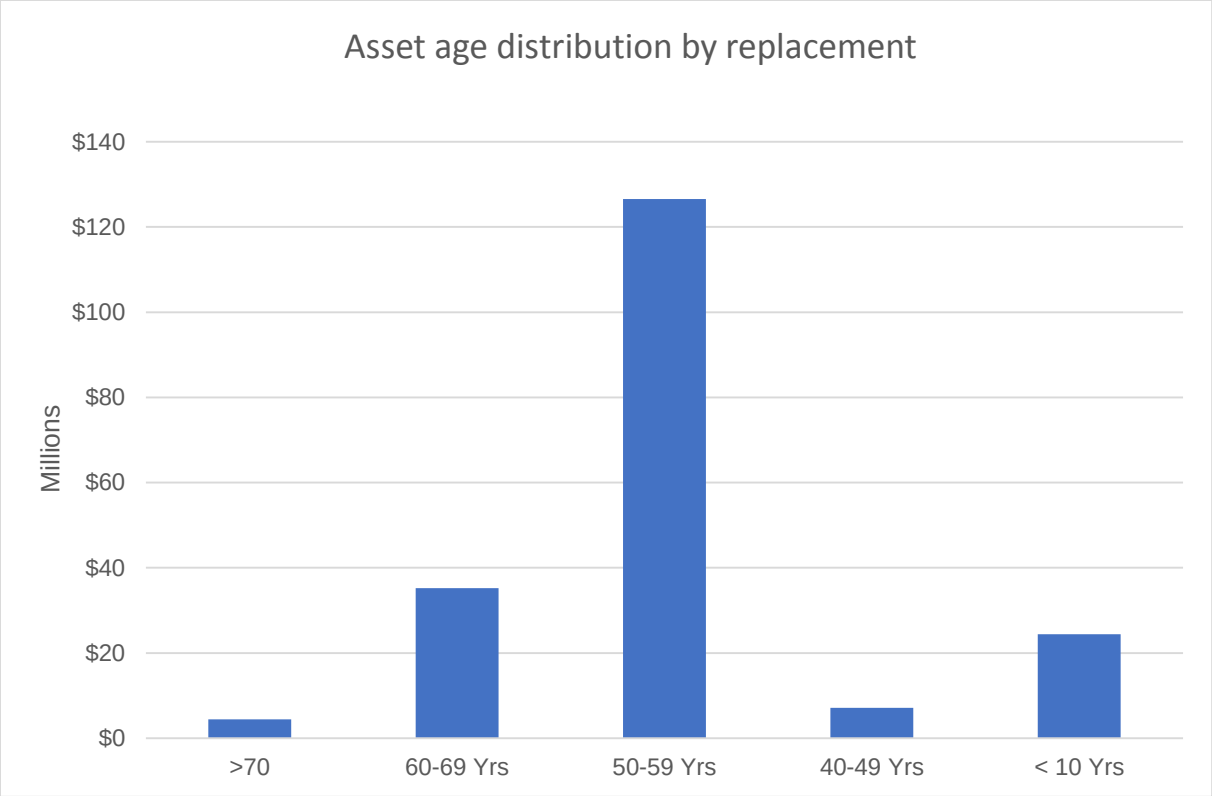


Figure 8.7 - Flood Control asset age distribution by replacement

8.4 Asset Condition

Dams

The Canadian Dam Association (CDA) defines risk as "the consequence of an adverse event and the probability of such an event occurring." Within a finite resource framework, it is not possible to completely eliminate the risks associated with dams. Using modern engineering analysis and techniques, however, it is possible to greatly reduce risk. When hazards are greater for a structure, the safety requirements are proportionately more rigorous to offset the increased risk. As the owners of flood protection infrastructure, TRCA has an obligation to identify and undertake works to maintain these structures in a state of good repair. With limited funding available for flood infrastructure repairs, TRCA must rank the priority of capital works. This requires that TRCA understand how each structure is performing using engineering judgement alongside criteria provided by the CDA and the Lakes and Rivers Improvement Act (LRIA). Using inspection and engineering reports, each structure is ranked using a probability/consequence matrix. In order to understand the overall safety of a structure, performance during several scenarios must be considered. For example, a dam may be considered safe for smaller, more frequent flood events but may not be able to withstand an extreme flood. Therefore, several scenarios are considered when evaluating the state of repair.

These include:

- **Normal Conditions**: This scenario would include typical flood events that are frequent. Normal conditions would also consider typical loading or stressing of the structure, particularly embankment stability.
- **Extreme Flood Conditions**: This scenario considers the ability of the dam to withstand extreme, less probable flood events. Dams that cannot safely pass extreme floods can overtop and fail.
- **Seismic Conditions**: Seismic activity in Ontario is rare and is usually limited to small magnitude earthquakes. However, dam safety guidelines require high hazard dams to be able to withstand extreme earthquakes.

Evaluating dams using the criteria listed above helps prioritize capital works. Structures that do not meet guidelines for normal conditions would rank higher for repairs than a structure that is only at risk during extreme, low probability flood and seismic events. TRCA's objective is to make dams, channels, and Dikes safe for all possible events, however this will require long-term and large capital investments to achieve.

Evaluating dams for normal, extreme flood, and extreme earthquake scenarios requires that a score be given to each condition. The score corresponds to the dam's ability to withstand normal and extreme events. For example, a dam may have a structure condition rated as very good for normal conditions. However, if the dam overtops during extreme floods, the structure condition for that scenario may rank as poor because the probability of failure is higher for this event. If the same dam meets the requirements for seismic events, the structure condition for that scenario would be rated as very good as the probability of failure would be low.

Normal Conditions Risk Ranking

Normal conditions risk ranking evaluates the risk of structures failing when conditions are within the expected range of events for a given year. Normal conditions would include periods with no precipitation and smaller, more probable flood scenarios.

For state of repair analysis for normal conditions, TRCA evaluates each structure and categorizes them in terms of "probability of failure" and "consequence rating." The probability of failure is based on the structure condition assessment and estimates the likelihood of a deficiency causing the structure to fail. Structure condition considers the overall condition of the structure based on DSR studies and inspection results. Structures are scored from one (1) to five (5). A structure with a score of one (1) is in very good condition with a low probability of failure. A structure with a score of five (5) has a very poor structure condition rating and therefore a very high likelihood of failure. Structure condition ratings are described in Table 8.7.

Table 8.7 - Structure Condition Assessment/Probability of Failure Criteria

Condition Rating Score	Condition	Structure Condition Assessment Definition	Probability of Failure
1	Very Good	Well maintained, good condition, new or recently rehabilitated.	Improbable
2	Good	Good condition, few elements exhibit deficiencies.	Not Likely
3	Fair	Some elements exhibit significant deficiencies. Asset requires attention.	Possible
4	Poor	A large portion of the structure exhibits significant deficiencies. Asset mostly below standard and approaching end of service life.	Likely
5	Very Poor	Widespread signs of deterioration. Service and safety are affected.	Very Probable

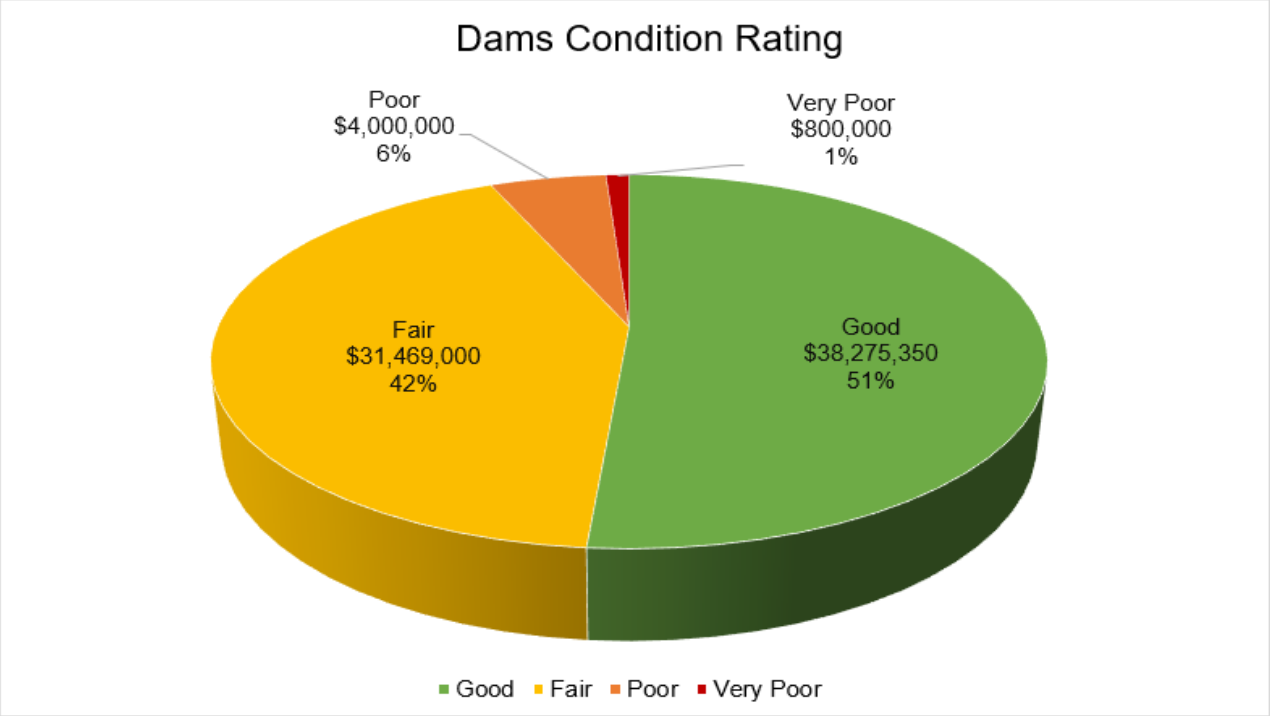
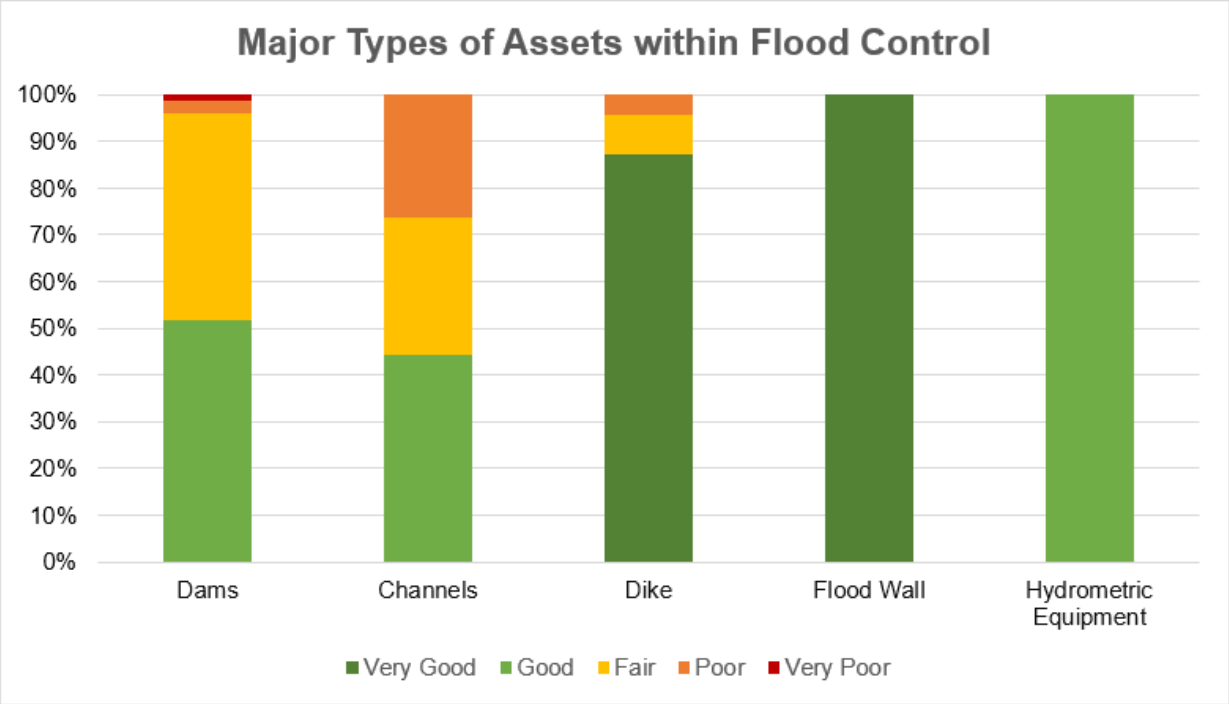


Figure 8.8 – Dams Condition Rating



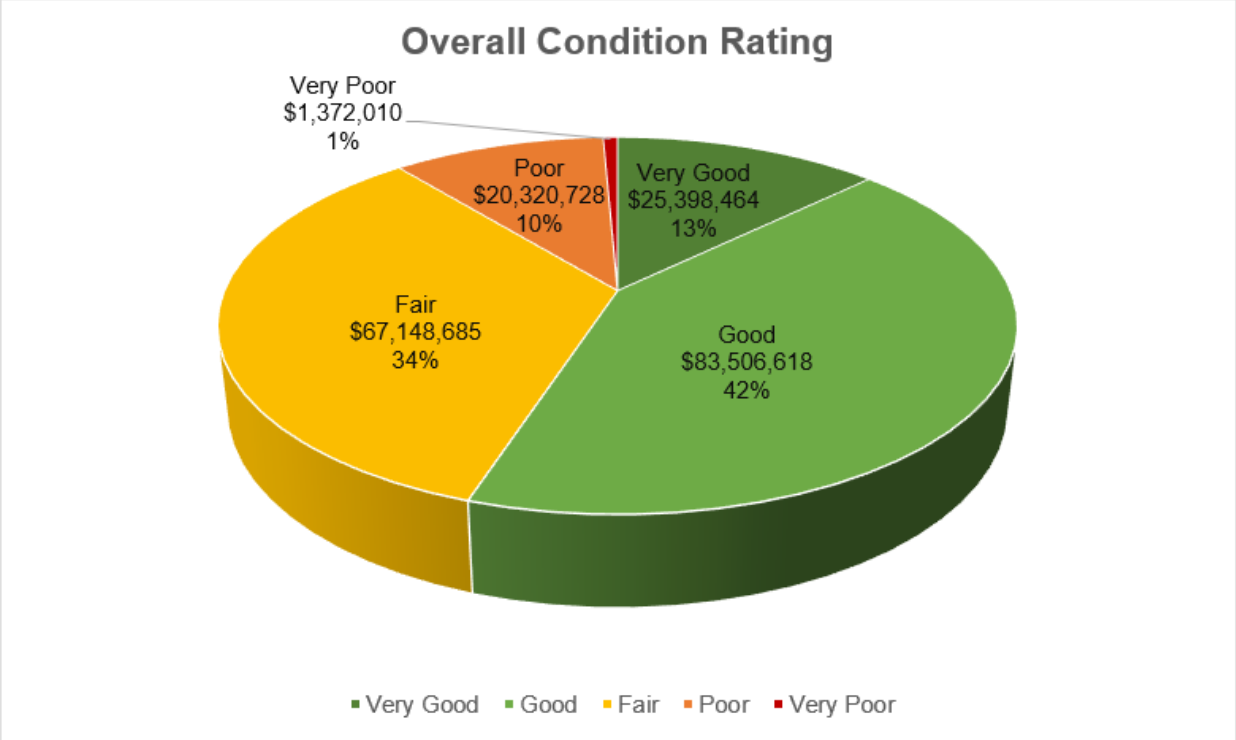


Figure 8.9 – Overall Condition Rating for Flood Control Infrastructure

In addition to the condition rating score, TRCA also considers the consequence to public safety and property should the structure fail or perform below expectations. Known as the consequence score, the consequence score is determined by estimating property and risk to life during a failure. The score is estimated on a scale between one (1) and five (5). The higher the score, the higher amount of damage would be expected if the structure fails. See Table 8.8 for a description of consequence rating score criteria.

Table 8.8 - Consequence Rating Score Criteria

Consequence Rating Score	Consequence Rating Definition
1	Insignificant damage to property.
2	Minor/slight damage to property.
3	Limited damage to property.
4	Significant damage to property. Possible public safety risk.
5	Major risk to property and public safety.

The consequence rating score is multiplied by the condition rating score to determine an overall state of repair/risk ranking score. This score is then placed on a risk ranking matrix to determine the overall risk of the structure. See Table 8.9 for the risk ranking matrix. The results of the risk ranking matrix are included in Table 8.10 for dams, Table 8.11 for channels and Table 8.12 for dikes. Risk ranking is comprised of four (4) categories:

- Low Risk (1-5, green shading)
- Moderate Risk (6-10, yellow shading)
- High Risk (11-15, orange shading)
- Extreme Risk (16-25, red shading)

This assists TRCA in understanding where to focus limited capital funds for repairs. Structures with a risk ranking in the High and Very High Category require priority attention to repair the deficiency.

It should be noted that there are limitations to determining risk. The complexity of forces acting on a structure is difficult to quantify and therefore determining the probability of failure is difficult. Experience, training, and engineering judgment are used to assess the stability and performance of flood infrastructure. Regardless, the process for evaluating structures is somewhat subjective. With the limitations of current inspection techniques, it is not possible to say with certainty that a structure will or will not fail. Inspections can identify potential failure modes, but the complexity of the loads and stresses placed upon structures cannot be precisely measured and so there is a degree of unpredictability in evaluating them.

Table 8.9 - Risk Ranking Score Matrix

CONSEQUENCE RATING					
CONDITION RATING/RISK OF FAILURE	**Insignificant damage to property. 1**	**Minor, slight damage to property. 2**	**Limited damage to property. 3**	**Significant damage to property. Possible public safety risk. 4**	**Major damage to property. Major risk to public safety. 5**
Very poor condition Very probable risk of failure 5	5	10	15	20	25
Poor condition Failure likely 4	4	8	12	16	20
Fair condition Possible failure 3	3	6	9	12	15
Good condition Failure not likely 2	2	4	6	8	10
Very good Improbable 1	1	2	3	4	5

Extreme Conditions – Dams

Additional analysis may be required to evaluate risks for rare conditions such as extreme floods or earthquakes. Extreme floods may overtop dams causing failures. Earthquake events could cause structural failures in dams. To understand how a risk is affected by extreme events, the structure condition assessment score is increased. For example, a dam that is considered safe under normal conditions but may fail during an earthquake, the structure condition assessment score is increased to account for the inability of the dam to withstand ground movement during a seismic event. This increases the risk score of the structure. The consequence score remains the same because the same area is affected by a dam failure. Risk rankings for extreme conditions at dams are included in Table 8.10.

Dam safety guidelines consider extreme events in their criteria for determining safe structures; however, it is difficult for dam owners to meet all the guidelines because standards keep evolving. For example, a dam built in 1970 would meet the guidelines for that time period. As engineering knowledge progresses the standards change, and the dam built in 1970 would not meet standards in 2020. This creates difficulties for dam owners in that dams need to be constantly upgraded and modified to meet

the most current safety guidelines. Often these repairs are very costly and difficult to implement. However, because the probability of these extreme events is so low, the priority to mitigate the risk is lower. Priority repairs are focused on deficiencies for normal conditions, however, TRCA is undertaking studies to implement repairs for extreme events as well.

Table 8.10 - Dam Risk Ranking for Normal, Flood and Seismic Conditions

Dams							
Dam Name	**Consequence Rating Score[1]**	**Asset Condition/ Probability of Failure – Normal Conditions[2]**	**Risk Rating - Normal Condition[3]**	**Asset Condition/Probability of Failure – Extreme Flood Conditions[4]**	**Risk Rating – Extreme Flood Conditions[5]**	**Asset Condition/Probability of Failure – Extreme Seismic Condition[6]**	**Risk Rating – Extreme Seismic Condition[7]**
G. Ross Lord Dam	5	1	5	2	10	1	5
Claireville Dam	5	1	5	3	15	2	10
Stouffville Dam	5	2	10	3	15	2	10
Milne Dam	5	2	10	4	20	2	10
Palgrave Dam	5	3	15	5	25	3	15
Black Creek Dam	2	1	2	1	2	1	2
Secord Dam	2	4	8	5	10	3	10
Osler Dam	2	5	10	5	10	5	10
Glen Haffy Dam West	1	2	3	3	3	3	3
Glen Haffy Dam East	1	2	3	3	3	3	3
Glen Haffy Fly Fishing Upper Dam	2	5	10	5	10	5	10
Glen Haffy Fly Fishing Lower Dam	2	5	10	5	10	5	10

- Consequence Rating Score – expected damage should the dam fail based on risk to life, property, and the environment. See Table 8.8 in the report.
- Probability of Failure/Structure Condition Score – based on the dam's ability to withstand typical floods and normal loading conditions. See Table 8.7 in the report.
- Risk Rating – Normal Conditions – This is the Consequence Rating Score multiplied by the Probability of Failure/Structure Condition Score. See Table 8.9 in the report.
- Probability of Failure – Extreme Flood Conditions - This is based on the dam's ability to safely pass extreme floods.
- Risk Rating – Extreme Floods - This is the Consequence Rating Score multiplied by Probability of Failure score. See Table 8.9 in the report.
- Probability of Failure – Extreme Seismic Condition - The is based on the dam's ability to withstand an extreme earthquake.
- Risk Rating – Extreme Seismic Event - This is the Consequence Rating Score multiplied by the Probability of Failure score. See Table 8.9 in the report.

Figure 8.10 - Stouffville Dam seismic study

Flood Control Channels and Dikes

TRCA undertakes annual inspections and engineering studies to determine the current asset condition for dikes and flood control channels. Dikes are assessed similarly to dams because during high flow events they impound water. Therefore, TRCA inspectors look for conditions that could cause the Dike to fail such as slumping, erosion, seepage, sinkholes, and other deficiencies. Flood control channels are inspected for blockages that reduce the capacity of the channel. Channel linings are also inspected for erosion that could lead to slope failure or damage to concrete panels. Channels and Dikes are not assessed for performance during extreme events. For example, extreme floods can overtop channels,

but overall stability may not be affected. Additionally, seismic activity would have minimal impact to a channel's stability. Dikes typically are not assessed for seismic activity because the dike is only under load during high flow events. The probability of a flood and a large earthquake occurring at the same time is very low.

Table 8.11 - Risk Ranking for TRCA Flood Control Channels

Flood Control Channels			
Channel Name	**Consequence Rating Score[1]**	**Asset Condition/ Probability of Failure – Normal Conditions[2]**	**Risk Rating -Normal Condition[3]**
Yonge/York Mills Channel	4	1	4
Woodbridge Channel	3	1	3
Stouffville Channel	3	4	12
Black Creek Channel	4	1	4
Scarlett Channel	4	1	4
Brampton Channel	4	1	4
Sheppard Channel	3	2	6
Malton Channel	4	1	4
Oak Ridges Channel	4	1	4
Bolton Channel	4	1	4

- **Consequence Rating Score** – expected damage should the channel fail based on risk to life, property, and the environment. See Table 8.8 in the report.
- **Probability of Failure/Structure Condition Score** – based on the channel's ability to withstand typical floods and normal loading conditions. See Table 8.7 in the report.
- **Risk Rating – Normal Conditions** - This is the Consequence Rating Score multiplied by the Probability of Failure/Structure Condition Score. See Table 8.9 in the report.

Table 8.12 - Risk Ranking for TRCA Dikes

Dikes			
Dike Name	**Consequence Rating Score[1]**	**Asset Condition/ Probability of Failure – Normal Conditions[2]**	**Risk Rating -Normal Condition[3]**
Pickering Dike	4	4	16
Ajax Dike	4	4	16
Bolton Berm	4	2	8
Etobicoke Dike	4	1	4
West Don Flood Protection Landform	5	1	5
Tyndall Flood Wall	3	1	3
Bolton Flood Wall	3	1	3

- **Consequence Rating Score** – expected damage should the Dike fail based on risk to life, property, and the environment. See Table 8.8 in the report.
- **Probability of Failure/Structure Condition Score** – based the Dike's ability to withstand typical floods and normal loading conditions. See Table 8.7 in the report.
- **Risk Rating – Normal Conditions** - This is the Consequence Rating Score multiplied by the Probability of Failure/Structure Condition Score. See Table 8.9 in the report.

8.5 Asset Deficiencies

Through TRCA's inspections and studies, deficiencies with dams, flood control channels and Dikes have been identified. Deficiencies are defined as structural, mechanical, geotechnical and hydrotechnical flaws in a structure that do not meet regulatory requirements, industry guidelines or operational criteria and could cause the structure to fail. TRCA has compiled a list of deficiencies and their expected repair costs in order to prioritize repairs and to take advantage of potential funding opportunities. The list of known deficiencies with TRCA's flood infrastructure is presented in Table 8.13. Current estimates for addressing deficiencies with TRCA flood infrastructure total approximately $34.1 million. As demonstrated in the Financial Strategy section of this AMP, current funding is not adequate to implement repairs. TRCA is currently looking to access federal and provincial government infrastructure grant funding and to secure matching funding from municipal partners.

Table 8.13 - TRCA Flood Infrastructure Deficiencies and Estimated Cost

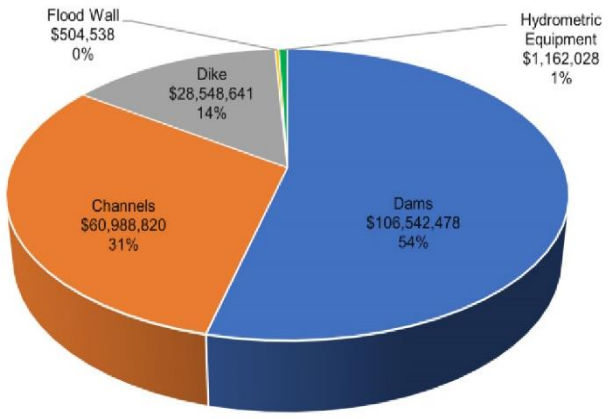
Project Name	Structure	Priority	Estimated Cost (2023 dollars)	Description
Stouffville Dam Embankment and Emergency Spillway Repair	Stouffville Dam	High	$505,000	Embankment requires rip rap buttressing on downstream slope to increase the factor of safety. Emergency spillway requires erosion protection.
Palgrave Dam Major Maintenance and Overtopping Protection	Palgrave Dam	High	$1,125,000	Dam requires repairs to install overtopping protection on the embankment. Stop log deck and hoisting system require upgrades to allow installation and removal of stop logs.
Glen Haffy Extension Dams Decommissioning	Glen Haffy Extension Upper Dam and Lower Dam	High	$1,687,000	Engineering study for decommissioning approvals. Implementation of decommissioning.
Stouffville Dam Embankment Repair	Stouffville Dam	Medium	$281,000	Emergency spillway requires erosion protection. Earthen embankment does not meet factor of safety requirements.
Stouffville Channel Major Maintenance and Naturalization	Stouffville Dam	High	$1,012,000	Removal of existing gabion basket lining and replace with natural channel materials.
Pickering/Ajax Dyke Reconstruction	Pickering Dyke/Ajax Dyke	High	$14,175,000	Reconstruct dykes to meet current engineering guidelines.
Black Creek Dam Spillway Pipe Modification	Black Creek Dam	Medium	$1,125,000	Modify spillway pipe to eliminate debris blockages.
G. Ross Lord Dam Gate Optimization and Operational Study	G. Ross Lord Dam	Medium	$393,000	Engineering study to maximize G. Ross Lord Dam's reservoir storage for short duration, high intensity storms.

Project Name	Structure	Priority	Estimated Cost (2023 dollars)	Description
Secord Dam Decommissioning	Secord Dam	Medium	$1,237,000	Engineering studies and dam decommissioning works.
Osler Dam Decommissioning	Osler Dam	High	$337,000	Engineering studies and dam decommissioning works.
Woodbridge Grade Control Structure Removal (Board of Trade Weirs)	Woodbridge Channel	Low	$1,125,000	Engineering study and removal of two grade control weirs.
G. Ross Lord Dam Safety Review	G. Ross Lord Dam	Low	$191,000	Undertake Dam Safety Review
Claireville Dam Major Maintenance	Claireville Dam	Low	$7,875,000	Enlarge spillway apron for extreme flows. Upgrade gate hoisting systems and repaint gates. Repair spillway wall.
Milne Dam Major Maintenance	Milne Dam	Medium	$3,037,000	Install overtopping protection to earthen embankment. Enlarge spillway apron for extreme flows. Increase factor of safety for spillway and wing walls.
			$34,105,000	

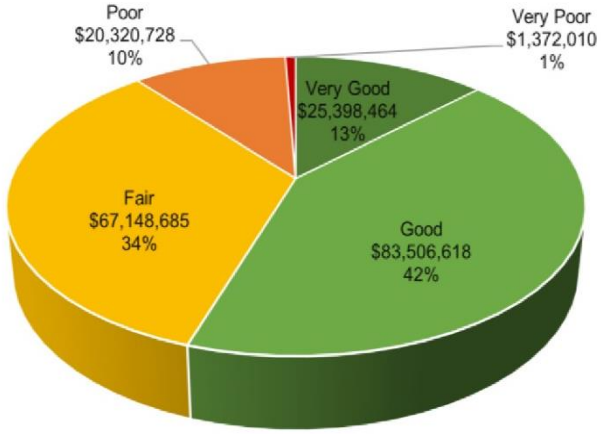
Total Asset Replacement Value:	**$197,746,505**
Current Condition:	Good
Future Condition Trend (next 10 years):	Increasing
TRCA Strategic Plan:	Reduction or elimination of existing flood risks within our jurisdiction.
Assets Included in this Category:	Dams, Channels, Dike, Flood Wall and Hydrometric Equipment
Data Confidence and Reliability:	Condition Based: Medium

The total replacement value of TRCA Flood Control infrastructure is $197,746,505 million. The 50% of the assets are in Good to Very Good condition, and 34% are in Fair condition, with the remaining assets close to, or past, the end of Service Life. As the TRCAs Flood Control services assets are overall in Good condition, these assets are meeting current needs but aging and may require attention.

REPLACEMENT VALUE BY ASSET TYPES



CONDITION OF FLOOD CONTROL INFRASTRUTURE ASSETS



8.6 Levels of Service

The regulation requires a description of levels of service (LOS) for core infrastructure assets, in accordance with the metrics provided in the regulation. Table 8.14 provides a summary of TRCA's core objectives based on the three different types of LOS.

8.6.1 Corporate LOS

The corporate LOS, as the corporate objective, is based on the core mandate of the Flood Risk Management (FRM) group, which is to protect life and property against the hazards of flooding and erosion, a core objective of Conservation Authorities (CA) under the *Conservation Authorities Act.*

It is important to note that Conservation Authorities generally work to achieve this mandate through the application of Ontario Regulation 166/06 (O. Reg. 166/06), which aims to protect *new* development from the hazards of flooding and erosion through the planning process, while TRCA's FRM aims to protect *existing* development from these hazards through the operation of flood infrastructure, flood forecasting and warning, and implementation of remedial works on existing infrastructure.

Managing flood risk through the installation and operation of flood infrastructure is part of the core mandate as described in the Conservation Authorities Act. Specifically, Section 21 empowers Conservation Authorities to:

- erect works and structures and create reservoirs by the construction of dams or otherwise.
- control the flow of surface waters in order to prevent floods or pollution or to reduce the adverse effect thereof.

Therefore, the Corporate LOS is aligned to meet the requirement for TRCA to meet its obligations under the CA Act, which being the installation, operation, and maintenance of flood infrastructure to protect areas at risk of flooding to the limit of available funding each year.

8.6.2 Customer LOS

The Customer LOS defines the services that the flood control assets provide to TRCA's municipal partners and residents within its jurisdiction.

As the very objective of the flood control structures is to protect life and property, the customer LOS is primarily qualitative because it has high social value. Additionally, TRCA smaller dams provide recreational activities such as fishing and boating. The Customer LOS for both the flood protection and recreational opportunities is difficult to quantify. For the benefits of flood protection, extensive studies are required to determine the social and economic benefit TRCA's flood infrastructure provides. There is high economic value of this infrastructure because of the value of the land and/or structures that it protects (e.g., commercial centers, critical infrastructure, schools, housing, etc.); unfortunately, the total market value of the structures and land that TRCA's flood control assets protect has not been determined. However, it can be assumed that TRCA's inventory of flood infrastructure prevents hundreds of millions in flood damage and protects thousands of people from flood risk.

There is limited asset-specific information that provides an idea of the economic value of flood control structures. However, one example of the level of risk presented by TRCA's flood infrastructure is G. Ross Lord Dam. As discussed earlier in this report, failure of the dam would result in a potential loss of life of up to 3000 persons and $1.3 billion in property damage. While this site would be an extreme case, more

site analyses are needed to determine the average Return on Investment (ROI) for TRCA's erosion control assets. Undertaking these studies is costly and TRCA will have to weigh the benefits of undertaking these investigations.

The customer level of service objective is therefore to maintain flood control works on a priority basis in a manner that is clear, consistent, and defensible, to the limit of available funding provided by the benefiting municipality. Priorities are to be based on TRCA's evaluation criteria and further refined based on input from the benefiting municipalities to ensure that additional factors are taken into consideration when prioritizing the timing of implementation for maintenance works. Potential collaboration opportunities on larger restoration works that address the erosion hazard as well as achieving other strategic priorities (e.g., habitat preservation or enhancement, improved public access, etc.) may also be realized.

8.6.3 Technical LOS

The technical LOS defines the technical standards, regulatory requirements and industry guidelines needed to achieve level of service objectives through the use of quantifiable metrics and technical expertise.

TRCA utilizes a technical LOS for prioritizing the monitoring and maintenance of flood control assets. There are numerous agencies in North America that provide guidelines for the construction, operation, maintenance, and surveillance of flood infrastructure assets. Flood Infrastructure and Hydrometric staff use these guidelines to develop protocols for ensuring a good state of repair for flood infrastructure assets.

Resources for the safe management of flood infrastructure at TRCA include:

Dams[1]:

- Lakes and River Improvement Act (Ministry of Natural Resources and Forestry)
- Canadian Dam Safety Guidelines (Canadian Dam Association)

For Dikes and Flood Walls:

- Design and Construction of Levees, United States Army Core of Engineers (USACE)
- International Levee Handbook, USACE

For Flood Control Channels:

- Structural Design of Concrete Lined Flood Control Channels (USACE)

8.6.4 Levels of Service Metrics

The following table outlines the Level of Service (LOS) for TRCA flood infrastructure assets using Customer, Corporate, and Technical criteria.

[1] For information on these documents, please see Asset Inventory, Dams in Ontario section above.

Customer Level of Service

Customer Value	Customer LOS Objective	Customer LOS Measure	Customer LOS Performance	Customer LOS Target	Customer LOS Target
Flood Protection	Flood protection provided by infrastructure maximized	% of flood structures that are providing the level of protection as per design	76% of structures are providing their design level of protection	Structures should be providing 100% of the design criteria flood protection	
Safety	Flood infrastructure is operated and managed safely.	% of flood structures with an asset condition of "Poor" or "Very Poor"	13% of structures have a conditin assessment of "Poor" or "Very Poor"	100% of structures should be "safe" for communities	
Flood Warning	Hydrometric instrumentation provides timely flood warning	% uptime for real-time hydrometric equipment	95% Uptime for hydrometric network.	Hydrometric equipment should be operable 100% of time	

Corporate and Technical Level of Service

Corporate LOS Objective	Technical LOS Measure	Technical LOS Performance	Technical LOS Trend	Technical LOS Target
Environmental Hazard and Hazard Management: Identify and map flood hazards, provide flood forecasting and warning services, and operate flood mitigation infrastructure	% of structures meeting applicable industry standards for safety	65% of flood infrastructure meets applicable industry standards for safety		100%
Service Excellence: Complete asset management and state of good repair assessments and improvements	Number of required inspections per year are undertaken	440 inspections per year on all flood infrastructures		440

Corporate LOS Objective	Technical LOS Measure	Technical LOS Performance	Technical LOS Trend	Technical LOS Target
Environmental Hazard and Hazard Management: Identify and map flood hazards, provide flood forecasting and warning services, and operate flood mitigation infrastructure	% uptime for hydrometric equipment	>95% Uptime for the hydrometric network		100%

	**Positive Upward**		**Positive Downward**		**No Change**

8.7 Asset Management Strategy

The effective management of TRCA's critical infrastructure assets can have tremendous consequences on the safeguarding of life, health, or property along with savings for municipal and regional partners. As part of its asset management strategy, TRCA has many facets when it comes to its flood control AMP.

8.7.1 Continual Improvement and Innovation

AMPs should be continuously evaluated and improved through clearly defined actions such as:

- Review of asset performance;
- Up-to-date inventories;
- Updates to asset information;
- The inclusion of unplanned corrective maintenance expenditures;
- Updates to preventative maintenance plans;
- Performance metric reviews;
- Return on Investment reviews (ROI is a data gap in the flood infrastructure program);
- Life Cycle Costing Index reviews; and
- Review of latest trends and technologies.

Flood Infrastructure and Hydrometrics is slowly shifting its strategy towards a more effective AMP through focused preventative maintenance and enhanced monitoring of its assets. The following is a summary of monitoring activities and documentation to reduce risk from TRCA's flood infrastructure.

Flood infrastructure is designed to protect life and property, but also carries risk. The failure of structures designed to create storage and divert flood water can cause an uncontrolled release of water into developed areas. As an owner of dams, channels, and Dikes, TRCA must strive to ensure these structures are managed safely.

The following sections outline:

a. the framework in which TRCA operates, maintains, and inspects flood infrastructure;
b. the current condition and associated risk of TRCA flood infrastructure;
c. major studies and repairs from 2016 to 2020;
d. future work to ensure long-term safety and stability of existing flood infrastructure;
e. funding details and grant opportunities.

8.7.2 Dam Safety in Ontario

Dam safety in Ontario is regulated by the Ministry of Natural Resources and Forestry (MNRF) under the Lakes and Rivers Improvement Act (LRIA). They are responsible for developing the criteria that dams must meet and regulating dam owners in the safe operation and maintenance of dams. The Canadian Dam Association (CDA) is an advisory body comprised of voluntary dam safety experts supported by dam owners in Canada, including TRCA. The CDA provides technical and management guidance for dam owners using internationally recognized best practices. TRCA uses a combination of both MNRF and CDA guidelines for managing structures. This is because there are cases where one set of guidelines do not cover specific topics. For example, LRIA guidelines do not address emergency management of dams and therefore TRCA uses the CDA Emergency Management for Dam Safety Technical Bulletin.

Lakes and Rivers Improvement Act

In 2011, the Ontario Ministry of Natural Resources and Forestry (MNRF) introduced the *Lakes and Rivers Improvement Act* Administrative Guide, Technical Bulletins and Best Management Practices Guide (LRIA). These documents are based on criteria developed by MNRF and the Canadian Dam Association (CDA), and provide guidelines for the safe design, construction, management, operation, and repair of dams in Ontario. It is a resource for engineers, operators, and owners to use when assessing the safety of a dam. The LRIA Guidelines are not legislated but define best management practices and therefore the minimum standard of safety for dam owners in Ontario.

A critical component of the LRIA is the Dam Safety Review (DSR). The DSR is an in-depth engineering study of a dam. Components of a DSR include geotechnical analysis of stability, a public safety review, hydro-technical analysis, structural inspection, and other investigations. Based on the results of the DSR, the dam receives a Hazard Potential Classification (HPC). The HPC determines the risk to the public if a dam were to fail. Dams with higher risks are required to meet more stringent and conservative engineering standards. For example, a dam failure that is estimated to cause a loss of life greater than 11 persons would have an HPC of Very High. Dams with an HPC of Very High would have to meet the strictest guidelines for dam safety including safely passing the largest theoretical flood that can occur in southern Ontario (which, for reference, is larger than Hurricane Hazel). Note that safely passing a flood flow does not equate to storing the volume of that flood in a reservoir. Safely passing a flood means that the resulting flows can pass through the dam and reservoir without causing a dam failure.

Canadian Dam Association Dam Safety Guidelines

The CDA is a volunteer body of dam safety experts who create dam safety guidance documents using the best industry standards developed by various international organizations. CDA also develops training and workshop programs that offer hands-on experience for dam professionals. Particularly important recommendations from CDA include the development of emergency management guidelines. These provide a framework for responding to dam failures. TRCA assisted in the development of the emergency management guidelines and was an early adopter of CDA's recommendations for developing emergency management protocols. All TRCA high risk dams have emergency response plans in place. Additionally, TRCA is in the process of developing emergency response plans for dams with lower risks.

8.7.3 TRCA Flood Infrastructure Management Program - Dams

Dam Safety Management

TRCA's four largest dams are in urban areas. As such, a failure of one of these dams would have a significant impact on downstream communities. For example, the 2011 Dam Safety Review of G. Ross Lord Dam determined that a failure of the dam could place up to 3,000 persons at risk and cause up to approximately $1.3 billion in property damage. Proper management and maintenance of these dams is critical for public safety.

TRCA has adopted LRIA and CDA guidelines into its dam safety program and is in the process of upgrading each structure to meet the criteria required, where possible.

Inspection Program

Each dam in TRCA's inventory is inspected monthly and annually. TRCA's two largest dams (Claireville Dam and G. Ross Lord Dam) also undergo daily inspections to further reduce the risk of safety or stability issues. The total number of inspections on TRCA dams is approximately 550 each year.

- Daily inspections are visual inspections to note the condition of the earthen embankment, control structures and site security.
- Monthly inspections are more detailed. Emergency generators are exercised, gate motors are tested, back-up systems tested, communications equipment checked, dam instrumentation is calibrated, and embankments are inspected.
- Annual inspections are detailed assessments of each dam. Each component is thoroughly checked for correct operation:
    - earthen embankments are thoroughly inspected
    - gates are fully opened and closed
    - concrete spillways are inspected
    - gates are operated on emergency power
    - tunnels and shafts are entered and inspected
    - emergency generators serviced
    - gates and motors are lubricated and serviced
    - back-up gate operation systems tested

Operation, Maintenance and Surveillance Manuals

Each dam owned by TRCA has an Operation, Maintenance and Surveillance (OMS) manual. The OMS manual is a stand-alone document that describes all the activities necessary to manage the dam. Sections of an OMS include:

- roles and responsibilities with contact information
- how to operate the dam gates
- operation of emergency generators
- preventative maintenance procedures
- communications
- dam storage and discharge data
- emergency procedures
- inspection criteria

Each OMS is reviewed and updated each year to ensure the document is current.

Emergency Preparedness and Response Plans

TRCA uses CDA's Emergency Management for Dam Safety Technical Bulletin for guidance on drafting emergency response plans specific to each structure. There are two types of emergency management plans for dams. Emergency Preparedness Plans (EPP) are developed for external responding agencies that are responsible for public safety. In the event of a dam emergency, the responding agency can use the EPP to coordinate resources using the EPP's inundation maps. Inundation maps depict the expected flooded areas should a dam fail and can help first responders coordinate evacuations and road closures if required. Emergency Response Plans (ERP) are internal documents for TRCA use. Contact information for staff, roles and responsibilities, organizational flowcharts, equipment/aggregate supplier information, emergency dam repair documentation, and other critical information for managing dam emergencies are included in the ERP. TRCA maintains EPP's and ERP's for all High and Very High HPC dams.

8.8 Studies, Repairs and Preventive Maintenance

Due to the complexity of dam construction and risk, TRCA undertakes numerous engineering studies to investigate the condition of the structures. Dam Safety Reviews (DSR's) are the most common study, but other investigations can be required as well. It may be necessary to design a repair or to further investigate a deficiency. For example, a DSR at Stouffville Dam found that the dam may be at risk of failure during an earthquake, warranting either further study on seismic risk, or alternatively a costly stabilization project. A specialized study was initiated using the latest seismic risk investigations to confirm whether a costly repair was warranted. The study found that the risk of failure due to an earthquake was minimal and modifications to the dam were not required.

When inspections or studies find that repairs are required, TRCA retains qualified consultants and contractors to undertake the repair. Most common repairs include electrical upgrades at dams, dredging of flood control channels, and minor concrete repairs. Major deficiencies require extensive design, complex approvals, and significant capital funds. TRCA is investigating opportunities to obtain adequate funding to undertake some of the major work required to make TRCA infrastructure fully compliant with

current guidelines.

Preventative maintenance is a critical part of TRCA's management of dams. In 2019, TRCA assigned a field crew to specifically undertake preventative maintenance activities on flood infrastructure. Preventative maintenance on dams is primarily geared toward removing vegetation from embankments. Removing vegetation on a regular basis prevents large trees from establishing root systems that can damage the embankment. Trees on dams can also lead to seepage issues and impair an inspector's ability to see the condition of the embankment. Preventative maintenance activities on dams can also include minor concrete repairs, debris management at dam intakes, and painting of gate components.

Public Safety Around Dams

Dams in Ontario are required to follow the Public Safety Around Dams (PSAD) Technical Bulletin from the LRIA. Statistically, it is far more likely to have serious injury or death around a dam due to falls or drowning than from a dam failure. The PSAD evaluates all the hazards around a dam and prescribes mitigation measures to ensure that all areas of the dam are safe. Mitigation primarily includes barriers (fencing, guardrails, and safety booms) and warning signage. PSAD documents are reviewed annually to ensure all hazards are properly mitigated.

Dam Decommissioning

There are technical difficulties in bringing older dams into compliance with modern design guidelines. Older flood control dams were constructed using the engineering principles of the period in which they were built and cannot meet newer requirements unless substantial modifications are made. Historic, legacy dams such as mills, and recreational dams were built without any proper engineering or construction techniques and may never be able to meet LRIA guidelines. In these cases, options are limited to decommissioning the dam or increased risk management and tolerance. TRCA has decommissioned several dams in the past. Most recently, Albion Hills Dam was decommissioned in 2017 because the structure was in poor condition and unrepairable. There are several other dams in TRCA's inventory that will need to be decommissioned or replaced because their poor condition puts them at risk of failing. These include:

- Secord Dam
- Osler Dam
- Glen Haffy Extension Upper Dam
- Glen Haffy Extension Lower Dam

Removing these structures reduces TRCA liability and long-term costs. Even small dam failures can cause large amounts of property and environmental damage. Additionally, removing dams restores the river's natural functions and improves habitat and water quality.

8.9 TRCA Flood Infrastructure Management Program – Flood Control Channels and Dikes

Annual Inspections

As part of TRCA's Flood Infrastructure Management Program, channels and Dikes are inspected annually. TRCA staff walk the entire length of each structure each year. Flood control channel inspections ensure that the channels are free from sediment and large vegetation. Channel linings are

inspected to ensure that they are not eroding. Concrete is checked to ensure that structures are not at risk of failing during large events. The Dikes' earthen embankments are inspected to make sure the structures are not eroding, settling, or failing. Culverts and flap gates are checked to make sure that flood water cannot surcharge to the dry side of the Dikes. Information obtained during the inspection is used to direct preventative maintenance activities and, in the case of more serious deficiencies, design repairs for capital works projects. Dikes and channels are also inspected after flood events to confirm that they were not damaged.

Maintenance

TRCA's flood control channels and Dikes require maintenance activities to ensure that the structures are functioning correctly. Channels require dredging of sediment and removal of vegetation to ensure the capacity is maximized for flood events. Dikes should remain free of trees and large bushes to allow inspections of the earthen embankments. Large trees can also topple during large storms causing root systems to damage large sections of the Dike, possibly leading to failure. In the past, TRCA's flood control channels and Dikes have received sporadic maintenance which has led to costly, large-scale sediment and vegetation removal projects. In 2019, TRCA dedicated a full-time maintenance crew to conduct small-scale maintenance on the channels and Dikes. By undertaking annual maintenance on these structures, the need for expensive large-scale projects is greatly reduced. Operations were suspended for several months in 2020 due to COVID-19, but the crew is now working full-time to continue maintaining these structures.

Figure 8.11 - Geotechnical drilling at Claireville Dam's downstream wing wall

8.10 Financial Strategy

Funding for inspecting, maintaining, and operating TRCA's flood infrastructure and hydrometric networks comes from several sources including municipalities and the province. Funding has remained static for many years and current levels are not sufficient to address the major deficiencies associated with TRCA's dams, channels, and Dikes. The priority deficiencies with TRCA's flood infrastructure currently totals around $30 million. The hydrometric assets replacement estimates also require investments to ensure the networks are functioning reliably. Funding for the operation, maintenance, inspection, and repair of TRCA flood infrastructure is from several sources, as outlined below.

MNRF Section 39

MNRF Section 39 grant funding is provided to Conservation Authorities for natural hazard management. TRCA receives approximately $165,000/year for operation and maintenance of flood infrastructure. This is matched by municipal levy. This funding is targeted to operations and maintenance which includes program management, inspections, utilities, vehicles, communications, and dam operator housing subsidies. These funds are not available for capital repair projects.

Capital Levy

Municipal levy capital funding is provided for flood infrastructure maintenance repair works. This funding remains relatively stable year over year. Approximately $200,000 of these funds are used for preventative maintenance. Preventative maintenance costs include salary costs for field crews, vehicles, and equipment. This leaves approximately $469,000 per year for capital repair projects. Capital funding by municipality is presented in Table 8.14.

Table 8.14 - Municipal Capital Levy for Flood infrastructure 2022

Municipality	Funding
Durham Region	$22,000
York Region	$71,000
Region of Peel	$309,000
City of Toronto	$267,000 (includes Flood works Enhanced Capital)
Sub-Total	$669,000
Subtract Preventative Maintenance Costs	($200,000)
Total Funds Available for Capital Repair Projects	$469,000

While funding to address the major deficiencies is not available, TRCA leverages existing capital and grant funding to reduce the risk of asset failure as much as possible. Recent TRCA dam capital projects from 2016-2020 are presented in Table 8.15. Recent TRCA flood control channel and Dike capital projects from 2016-2020 are presented in Table 8.15.

Table 8.15 - Major Dam Safety Projects 2016-2024

Structure	Year	Project	Project Cost
G. Ross Lord Dam	2024	Dam Safety Review • **New Dam Safety Review required.**	$150,000
Palgrave Dam	2023-2024	Stop Log Gantry Installation • **Design and installation of new stop logs and hoisting system.**	$75,000
Claireville Dam	2023	Gate Decommissioning • **Implementation of gate repair.**	$50,000
Claireville Dam	2023	Wing Wall Repair • **Implementation of repair to wing wall.**	$150,000
G. Ross Lord Dam	2023	Seepage Study Phase 2 • **Continued investigation into dam's drainage system.**	$80,000
Palgrave Dam	2022	Deficiency Repair Design Study • **Design of repair to address deficiencies.**	$148,000
Claireville Dam	2022	Gate Decommissioning Study • **Study to decommission unused gate.**	$40,000
Glen Haffy Dams Safety Review	2022	Dam Safety Review and Feasibility Study • **Investigation of four dams within the Glen Haffy Conservation Area.** • **Decommissioning feasibility study.**	$160,000
Claireville Dam	2022	Wing Wall Repair Design Study • **Study to investigate wing wall settlement.**	$85,000
G. Ross Lord Dam	2021	Emergency Spillway Seepage Study Phase 1 • **Investigation into possible seepage risk**	$225,000
Claireville Dam	2021	Gate Motor Housing Repair • **Repair weather enclosures for gate hoisting equipment.**	$33,000

Structure	Year	Project	Project Cost
Stouffville Dam	2021	Concrete Repair • **Repair cracked and spalling concrete in spillway.**	$48,000
Claireville Dam	2020	Control Building Roof Repair • **Replace roof on control building.**	$30,000
Claireville Dam	2020	HVAC Repair • **Decommission boiler and install electric heaters throughout control building.**	$35,000
Stouffville Dam	2020	Concrete Repair and Emergency Spillway Repair Design Study • **Design for concrete and emergency spillway repairs.**	$90,000
G. Ross Lord Dam	2019	Hydrogeological Study • **Study to examine the dam's drainage and pressure relief systems.**	$85,000
Stouffville Dam	2018	Liquefaction Study • **Study to determine earthquake risk to dam.**	$63,000
Palgrave Dam	2018	Dam Safety Review • **Engineering review of the dam.**	$59,000
Milne Dam	2018	Deficiency Study • **Investigate overtopping mitigation options.** • **Investigate structural sliding deficiency.** • **Confirm uplift resistance of spillway.**	$84,000
Black Creek Dam	2018	Dam Safety Review • **Engineering review of the dam.**	$61,000
Black Creek Dam	2018	Reservoir Dredging • **Remove sediment and debris from dam spillway intake and restore capacity of reservoir.**	$1,760,000

Structure	Year	Project	Project Cost
Albion Hills Dam Decommissioning	2017-2018	Dam Decommissioning • **Remove existing dam and construct bridge over restored creek.**	$1,820,000

Table 8.16 - Channel and Dike Projects 2016-2023

Structure	Year	Project	Project Cost
Stouffville Channel	2023	Proposed Feasibility Study • **Study to investigate the feasibility of replacing existing gabion basket lining with a natural lining.**	$50,000
Mimico Malton Channel	2023	Proposed Vegetation Removal • **Preventative maintenance to remove vegetation.**	$40,000
Etobicoke Dike	2023	Proposed Embankment Repair • **Minor repair to eroded area of dike.**	$20,000
Sheppard Channel	2023	Proposed Vegetation Removal • **Preventative maintenance to remove vegetation.**	$15,000
Stouffville Channel	2022	Vegetation Removal • **Preventative maintenance to remove vegetation.**	$14,000
Etobicoke Dike	2022	Dike Stability Assessment • **Study to ensure dike meets stability requirements.**	$25,000
Bolton Dike	2021	Bolton Dike Major Maintenance • **Repairs to dike, including raising dike and installing new erosion protection.**	$1,820,000
Yonge York Mills Channel	2020	Concrete Channel Repair • **Concrete panel repair and underpinning.**	$65,000

Structure	Year	Project	Project Cost
Bolton Berm (Dike)	2019	Bolton Berm Ice Jam Study • **Engineering assessment of the 2019 Bolton ice jam.**	$55,000
Bolton Berm (Dike)	2019	Bolton Berm Major Maintenance Design Project • **Final Design drawings for Bolton Berm upgrades including erosion protection and raising of crest.**	$160,000
Scarlett Channel	2019	Scarlett Channel Erosion Project • **Repair erosion damage at outfall to Humber River.**	$200,000
Bolton Berm (Dike)	2018-2019	Bolton Berm Drainage Upgrades • **Flap gate installation and maintenance**	$20,000
Pickering Dike/Ajax Dike	2018-2020	Pickering/Ajax Dike Rehabilitation • **Conservation Class Environmental Assessment**	$450,000
Pickering Dike/Ajax Dike	2016	Pickering/Ajax 2D Modeling and Dike Assessment Project • **Flood assessment and structural investigation of Dike.**	$75,000
Malton Channel	2016	Channel Major Maintenance Dredging Project • **Removal of sediment and vegetation from channel**	$500.000
Bolton Berm (Dike)	2016	Bolton Berm Hydraulic Assessment and Remediation Study • **Flood assessment of berm and structural investigation of Dike.**	$102,000

Water and Erosion Control Infrastructure Funding

The Ministry of Natural Resources and Forestry supports conservation authorities to undertake maintenance activities throughout Ontario with the Water and Erosion Control Infrastructure Program (WECI). Under this program, repairs and studies undertaken on structures are eligible for 50% matching funds from the Province of Ontario. Projects are reviewed and prioritized by MNRF and only the highest ranked projects are awarded grants. TRCA applies for WECI funding every year for both repairs and studies. The WECI program has become a critical tool for funding capital improvement projects.

Table 8.17 - WECI Funding 2016-2023

WECI Funding received by TRCA 2016-2023	
2016/2017	$230,425
2017/2018	$218,802
2018/2019	$128,023
2019/2020	$126,045
2020/2021	$280,000
2021/2022	$653,000
2022/2023	$654,000
Total	**$2,290,295**

National Disaster Mitigation Program (NDMP)

The NDMP is focused on flood risk studies, flood plain mapping, non-structural or small-scale structural risk reduction measures, and not toward maintenance and upgrade projects for existing flood infrastructure. However, TRCA was successful in obtaining funding to optimize gate operations at G. Ross Lord Dam and to examine flood risk at Claireville Dam and Stouffville Dam. Total contribution to these projects from NDMP was approximately $211,000. TRCA has been informed that there may be future intakes for infrastructure projects.

Disaster Mitigation and Adaptation Fund (DMAF)

DMAF was created to fund large-scale infrastructure projects to implement projects that increase resiliency and reduce risk to the public. It is specifically geared towards risks associated with flooding, wildfires, and droughts. TRCA intends to pursue DMAF funding to address the major deficiencies with TRCA's flood infrastructure. Because the program has a minimum investment of $20,000,000, TRCA is bundling many flood infrastructure projects to meet this requirement. As a cost-sharing program, DMAF would still require matching funding contributions. Considering the significant capital costs of these projects, TRCA is initiating discussions for these future projects with funding partners.

TRCA has made several unsuccessful applications for DMAF funding but will continue to apply for future projects.

Future Renewal Need

Future Renewal Need in Asset Management Plans is used to predict funding requirements to rebuild infrastructure to maintain the existing Level of Service requirements. At this point in TRCA's asset management strategy, the investigation required to determine future renewal needs has not advanced. The backlog of capital projects is receiving priority attention. However, given the nature of dams, channels, and Dikes, it is possible to keep these existing structures operating in a reasonable state of repair for decades or longer. As long as preventative maintenance and capital upgrades continue to be undertaken, TRCA flood control assets can be maintained for many generations. Of course, deficient

structures that cannot be upgraded to meet current guidelines may have to be removed and, given the cost of replacement and changing attitudes to managing rivers, will not be rebuilt. More investigation is required to understand the long-term requirement of TRCA's flood infrastructure.

Note that the estimated need does not reflect any improvements to current asset management practices, such as optimized operational maintenance, adjustments to LOS, or use of other innovative techniques or the application of other funding sources (grants and subsidies). By optimizing approaches to maintain assets, TRCA's partners could realize significant cost savings over the useful life of its infrastructure. Should unplanned revenues become available, it would be prudent to apply them towards mitigating the backlog of unacceptable deficiencies associated with various structures. As further information becomes available, these financial projections will be improved.

8.11 Risks and Assumptions

This section of the asset management plan highlights all the current and foreseeable risks along with the assumptions made to forecast the future need.

Risks

The following risks that can impact the timing and value of renewal needs:

- Weather and climate change
- Changes to LOS targets
- External Pressures
- Economic conditions
- Legislative requirements
- Affordability

Weather Impacts

Severe weather events can significantly impact the stability and lifespan of flood control structures. Extreme weather events can overwhelm structures and cause failure. The unpredictable nature of climate change can have an effect on the safety of a structure as well. For example, structures designed to protect against the 100-year flood event may provide a lesser amount of flood protection if statistical analysis finds that the 100-year event is expected on a more frequent basis.

Changes to LOS targets

Flood Infrastructure and Hydrometrics utilizes a technical LOS for prioritizing the construction, monitoring, and maintenance of flood control assets. It is certain that, as the state of practice advances, the guidelines for maintaining safe structures may become more restrictive as well. This is certainly happening in dam safety engineering. As causes of dam failure become more well understood, guidelines are upgraded to more conservative requirements.

External Pressures

Some external pressure from city or regional governments may change the timing of maintenance and renewal needs. This may come in the form of pressure to undertake capital improvement from local governments and residents.

Legislative Requirements

Several legislative acts can potentially impact the timing of maintenance/renewal needs of flood control structures. In particular, Lakes and Rivers Improvement Act can change over time and could affect capital projects.

Affordability

Large, complex construction projects, dams in particular, can require large amounts capital funding. Market competition can drive up prices of engineering, contractors, and materials especially during times of major government spending on infrastructure programs. There are a finite number of professionals available to work on flood infrastructure projects.

Assumptions

The following are assumptions made throughout this report when compiling data for the AMP:

- Replacement values and plan assumes like-for-like with no expansion of the asset or major change in material type;
- Replacement costs include planning, permits/approval, legal, construction, post-construction monitoring, and other miscellaneous costs;
- Asset replacement value does not account for the value of the asset it is protecting;
- Essential assets that TRCA's flood control infrastructure protect have not been thoroughly reviewed, therefore, it can be assumed that the customer LOS performance measures is potentially larger than reported;
- The asset condition rating and deficiency table (Table 8.12) uses the most recent inspection data at the time the report was prepared (prior to September 25, 2020).

8.12 Importance of Full Life Cycle Costing

Life cycle costs should include all costs that are anticipated to occur during the ownership of an asset. This includes capital, operating and maintenance, and disposal expenditures. Unless these full life cycle costs are defined, it is difficult to effectively plan for complete infrastructure costs going forward. Once these expenditures are further understood, TRCA can utilize cost-effective management strategies by repairing or replacing the right assets at the optimal time. TRCA is working to better understand both the type and timing of treatments that lead to optimal infrastructure management. It is important that TRCA continues to analyze projects and manage existing assets based on full and optimal life cycle costing. This will ensure that current and future infrastructure will have sufficient funds available when needed. Plans for the ongoing improvement of information quality and the planning process will be an integral part of TRCA's Asset Management system going forward.

Administrative Buildings

SECTION 9: BUILDINGS - ADMINISTRATIVE

Introduction

The Toronto and Region Conservation Authority owns five administration buildings as below :

- The New TRCA Head Office,
- Boyd Centre,
- Restoration Services Centre,
- Dave Barrow Centre for Conservation, and
- Eastville

As of the writing of this report, sufficient data including the Building Condition Assessment (BCA) report is not available to include the Eastville facility in-scope within this AMP. Future updates to this section will be made as new BCAs are completed or existing BCAs are updated.

TRCA new Head Office

The building at 5 Shoreham Drive is a 4 story, 86,000 sq ft (8,000 sq m) mass timber office building. It is sized to support 400 full-time staff and designed to:

- Reduce operational costs.
- Provide a healthy workplace for employees and visitors.
- Set a high-water mark for office building development.
- Positively influence others engaged in designing and building communities in our jurisdiction and beyond.

TRCA is committed to applying best practices in green building and sustainable design. The building structure is a low-carbon wood which compliments the recent changes to the Ontario Building Code to permit wood structured buildings.

At minimum, the building will strive to achieve Leadership in Energy and Environmental Design (LEED) platinum certification and WELL Building certification.

Boyd Centre

This property consists of the main Boyd Centre building and two additional structures built in 2009 and a Cover-all built in 2016.

The Boyd Centre building is a two story plus partial basement, and was reportedly constructed in two phases (Original, and Addition). The Original building was constructed in 1930, and the Addition was constructed in 2005. It has since undergone several expansions and renovations and now serves as part of the Restoration and Infrastructure Campus and Field Investigation Storage Facility.

The property includes site development associated with the buildings including hard surface roadways and parking, soft landscaped areas, site improvements, septic system and the municipal site services and connections for the building.

Restoration Services Centre

This property consists of the main Restoration Services building built in 2007 and additional structures being a Cover-all, a Cold Storage, a Nursery Pole Barn, and a Nursery Workshop.

The Restoration Services building is a two story plus partial basement. The building has many sustainability features incorporated as it was designed to be a showcase for sustainable building design. It has LEED Platinum Certification.

The property includes site development associated with the buildings including hard surface roadways and parking, soft landscaped areas, site improvements, compostable toilet system and the municipal site services and connections for the building.

Dave Barrow Centre for Conservation

Dave Barrow Centre for Conservation is a two story plus partial basement structure including a detached two-story Coach House. It was initially built as a private residence, and after being purchased by TRCA, it has undergone extensive renovations completed in 2015. It now serves as an administrative and field office for TRCA, with a portion of the facility being leased to the York Region District School Board for outdoor education purposes.

The property includes site development associated with the buildings including hard surface roadways, parking and works yard, soft landscaped areas, and site improvements.

State of TRCA's Administration Facility Assets

9.1 Asset Data Inventory

TRCA owns and operates 5 Administrative Facilities, of which 4 listed in the Table 9.1 are in-scope for this report. The asset data inventory for buildings is managed in the Enterprise Asset Management (EAM) application. The original data was populated through the completion of third-party building condition assessment (BCA). The TRCA Head Office is currently in the last stages of construction with an expected Occupancy date of Fall 2024.

Table 9.1 – Administrative Buildings by Gross Floor Area (inclusive of miscellaneous structures).

Building Name	Gross Floor Area (Square Feet)	Unit	Structures
TRCA Head Office	86,000	Each	1
TRCA Boyd Centre	23,546	Each	3
Restoration Services Centre	33,204	Each	6
Dave Barrow Centre for Conservation	10,295	Each	2

9.2 Asset Valuation

The current valuation of TRCA's Administration Buildings is based on a combination of datasets. The New Head Office, currently under construction, is assigned a replacement value based on the incurred and anticipated construction costs as well as the insured value.

Excluding the New Head Office, the other three Administrative Facilities were assigned their replacement values following the completion of the Building Condition Report (BCA) in Q4 2023. Individual building components or system-level assets (e.g., HVAC system) are added together to generate an overall building system cost. These costs are used to develop condition scoring or Facility Condition Index (FCI) analysis.

To forecast capital funding requirements of an entire building more accurately, soft costs, current legislative and regulatory requirements are also included as necessary to determine an overall replacement value for the building. This replacement value is used to develop long-term funding needs.

Table 9.2 - Breakdown of TRCA's Administration Buildings inventory and replacement cost.

Service	Asset	Structures	Unit	Replacement Value
Administration Buildings 	TRCA New Head Office	1	Each	$ 72,318,592
	TRCA Boyd Centre	3	Each	$ 5,802,032
	Restoration Services Centre	6	Each	$ 6,168,821
	Dave Barrow Centre for Conservation	2	Each	$3,345,985
TOTAL				**$ 87,635,430**

9.3 Asset Useful Life

In reference to a typical useful life of 50 years, 83 % (by replacement value) of TRCA's Administration Buildings are less than 10 years old. This is due to the fact that the majority of the replacement value of the Administration Buildings portfolio can be attributed to the New Head Office. However, these assets will still require annual maintenance and periodic major maintenance activities, so they continue to provide the intended level of service throughout their service life.

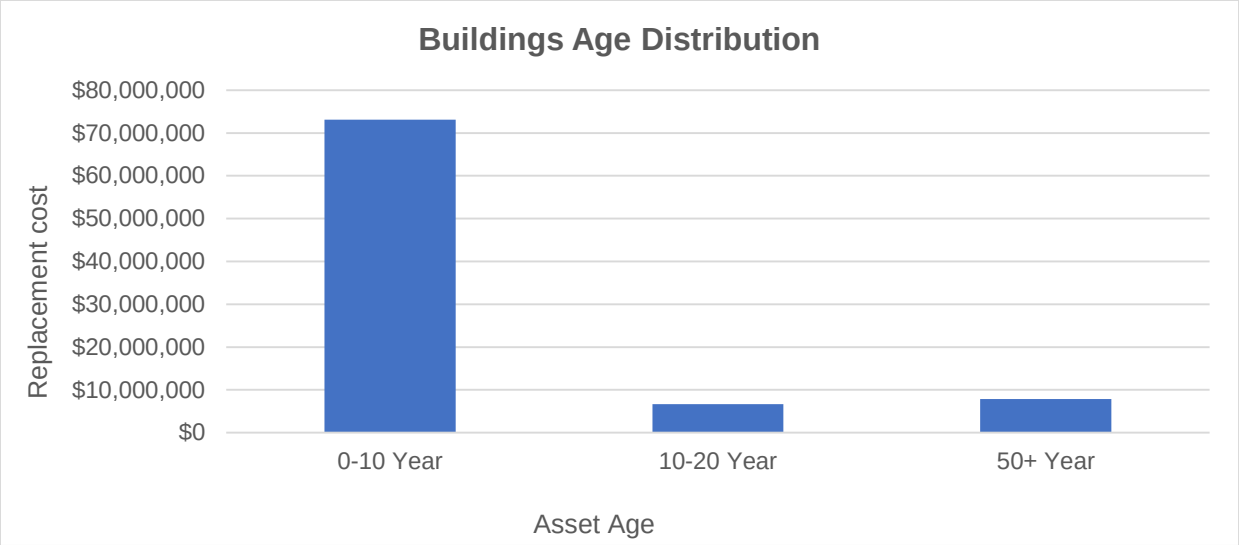


Figure 9.1 – TRCA Administrative Buildings Age Distribution

9.4 Asset Condition

Facility Condition Index (FCI) is the standard metric used for benchmarking building condition across a portfolio of buildings. FCI is a ratio of the repair/renewal needs to replacement value expressed in percentage terms.

Table 9.3 – Facility Condition Index and Condition Rating

Calculated FCI	Description	Overall Building Condition
0%-0.9%	The Facility and its components are functioning as intended; limited (if any) deterioration observed on major systems.	**Very Good**
1%-5%	The Facility and its components are functioning as intended; for most infrastructure assets, this would infer that no repairs are anticipated within the next five years.	**Good**
5%-10%	The Facility and its components are functioning as intended. normal deterioration and minor distress observed; repairs will be required within the next five years to maintain functionality.	**Fair**
10%-30%	The Facility and its components are not functioning as intended; significant deterioration and distress observed; repairs and some minor rehabilitation required within the next year to restore functionality.	**Poor**
>30%	The Facility and its components are not functioning as intended; significant deterioration and major distress observed; possible	**Very Poor**

Table 9.4 – TRCA Administrative Buildings – FCI

Building Name	Facility Condition Index (FCI)	Condition Summary	Condition Description
TRCA Head Office	N/A	Very Good	Building elements are like new, functioning as designed, minor / superficial deterioration. Minimal to no deterioration of major building systems.
TRCA Boyd Centre	5.2%	Fair	Building elements are functional and have experienced normal deterioration as expected given the age of the elements and expected service life. Minor distress of major building systems is observed indicating repairs and replacements will be required within the next five years.
Restoration Services Centre	0.9%	Good	Building elements are functioning as designed with regular preventative maintenance occurring. Majority of major building systems are not requiring replacement within the next 5 years.
Dave Barrow Centre for Conservation	9.35%	Fair	Building elements are functional and have experienced normal deterioration as expected given the age of the elements and expected service life. Minor distress of major building systems is observed indicating repairs and replacements will be required within the next five years.

The FCI rating translated to a 5-point rating scale allows TRCA's assets to standardize reporting and enables benchmarking against municipalities. The rating scale ranges from Very Good to Very Poor, as described in Table 9.3, and reflects the physical condition of the given assets.

83 % (based on replacement values) of TRCA's administration buildings are rated to be Very Good. This again can be attributed to the recently constructed New Head Office. The Restoration Services Centre building is relatively new and in good condition. Since the Dave Barrow Centre for Conservation building has been recently renovated there have been minimal life cycle capital replacements undertaken to date, and the building is in relatively good condition.

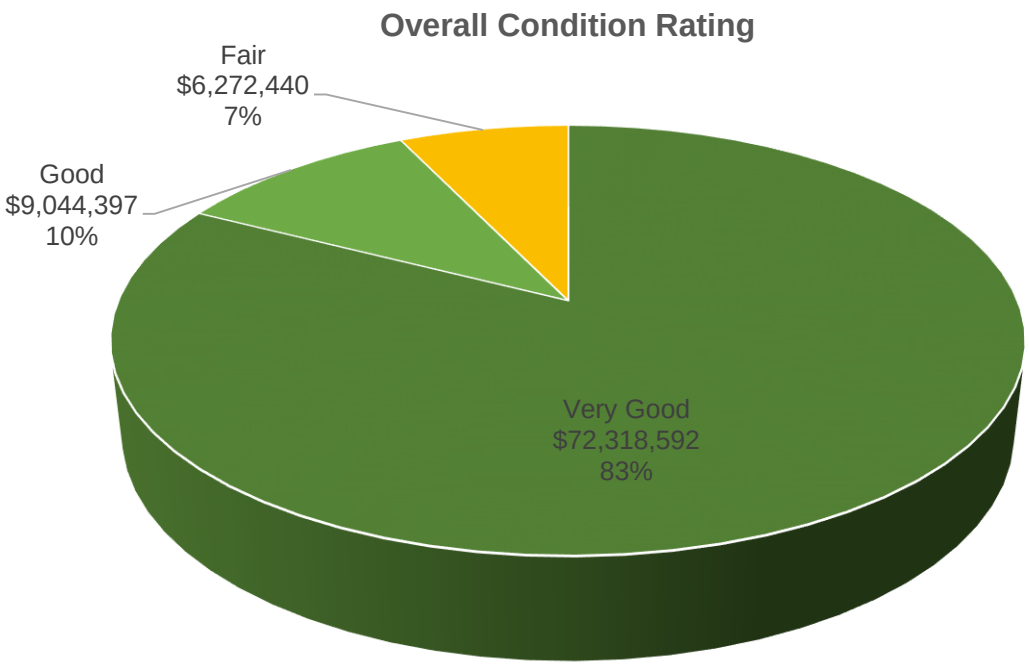


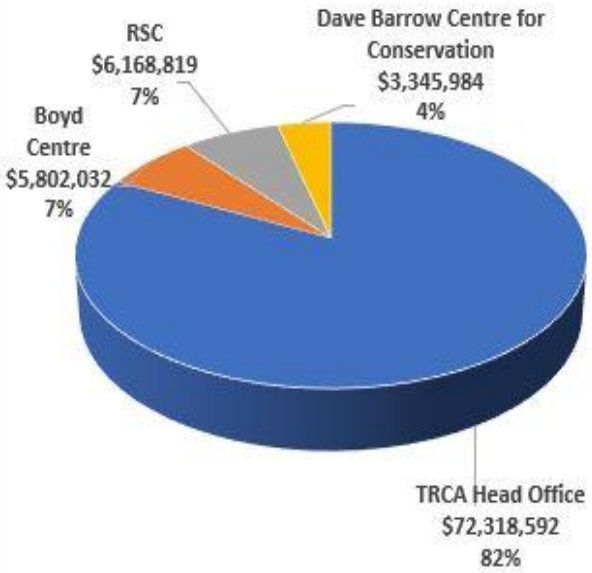
Figure 9.3 – TRCA Administrative Buildings condition

More broadly, based on the current asset data excluding the New Head Office and Eastville building, the portfolio is considered to be in **Good** condition.

Total Asset Replacement Value:	**$ 87,635,430**
Current Condition:	Good
Future Condition Trend (next 10 years):	increasing
Asset Management Policy:	Create complete communities that integrate nature and the built environment the Toronto region's economy.
Assets Included in this Category:	New TRCA Head Office, Boyd Centre, Restoration Services Centre and Dave Barrow Centre for Conservation
Data Confidence and Reliability:	Condition Based: Medium

The condition grades assigned to each building pertains to the building as a whole 93 percent (based on replacement values) of the TRCA's administration buildings are rated to be Very Good and Good. Based on the current asset data, the portfolio is considered to be in 'Good' condition.

REPLACEMENT VALUE BY ASSET TYPES



CONDITION OF ADMINSTRATION BUILDING ASSETS

9.5 Level of Service

Level of Service (LOS) performance measures are related to cost efficiency, safety, accessibility/ legislative, comfort, and sustainability.

Legislatively, TRCA's Administration Buildings are expected to comply with various codes and acts such as:

- Ontario Building Code
- Ontario Fire Code
- Accessibility for Ontarians with Disability Act
- Occupational Health and Safety Act

9.5.1 Customer LOS

Administration Buildings are primarily utilized by TRCA's staff, some of whom provide public facing services. Hence, the Customer Levels of Service for these assets would be the maintenance of these assets to an appropriate standard to provide a safe, secure, and functional environment for TRCA's staff and members of the public.

TRCA's LOS measures are outlined in table 9.4 below.

Table 9.5 - Customer LOS

Asset Class	LOS Objective	Value	Measure	Performance	Target
Facilities	Investing in existing infrastructure to provide safe, accessible, and functional facilities to the public.	**Quality**	Providing facilities in acceptable condition in fair or better condition	100%	
		Environmental Stewardship	Sustainability; Minimize energy usage and costs. Providing facilities that are environmentally conscious	3 Buildings	
		Safety	Annual Inspection of Fire System	100%	
		SOGR project	% of completed construction projects which meet total budget and cost	100%	

	**Positive Upward**		**Positive Downward**		**No Change**

9.5.2 Technical LOS

The technical LOS defines the technical requirements needed to achieve the level of service objectives through the use of quantifiable metrics and technical expertise.

One such indicator of the Technical LOS is the Facility Condition Index (FCI), which is the percentage of deferred maintenance of the overall replacement cost of the asset. TRCA aims to maintain its Administration building within Good to Fair rating.

Based on current information, Administration Buildings are generally in good condition; however, as they age there would be an expected deterioration in the FCI level necessitating expensive rehabilitation.

Table 9.6 - Technical LOS

Asset Class	LOS Objective	Values	Measure	Performance	Target
Facilities	Investing in existing infrastructure to provide safe, accessible, and functional facilities to the public.	**Quality**	FCI of facilities	2.37 %	
		Environmental Stewardship	Annual electricity consumption per kWh	106.26	
			Annual natural gas consumption per m^3	3.25	
			Annual water consumption per m^3	0.19	
			Annual propane consumption per square meter (L/sq.m)	0.085	
		Safety	Perform Annual Inspection and Certification as per Building code	100%	
		SOGR project	% of completed construction projects delivered on schedule	95%	

	**Positive Upward**		**Positive Downward**		**No Change**

External trends and issues that could affect TRCA's ability to meet defined levels of service include:

- Infrastructure is failing prematurely due to environmental factors and/or construction practices.
- Availability of external funding (such as federal, provincial, and municipal infrastructure programs)
- Potential changes in federal or provincial legislation that must be incorporated as part of ongoing service delivery.

9.6 Asset Management Strategy

In addition to the annual Facilities Condition Index (FCI) update, TRCA aims to conduct comprehensive building condition assessments (BCA) to better understand the condition of all building systems and their components on a 5-year rolling schedule. Preventative maintenance activities by staff are carried out to ensure assets are well maintained and performing to targets.

These strategies utilize a combination of lifecycle activities for buildings such as maintenance, renewal/rehabilitation, replacement and decommissioning or disposal.

Outside of the legislated requirements, most lifecycle activities are funding dependent with critical projects such as health and safety, mitigating high consequence of failure, etc. taking precedence over preventative projects such as cosmetic upgrades.

9.7 Financial Strategy

Table 9.7 below outlines the long-term year-over-year financial expenditure outlook for the Administration Building portfolio. The financial figures for the three Administrative Buildings (Boyd, Restoration Services and Dave Barrow Centre for Conservation for Conservation) excludes the New Head Office building given that it is currently under construction and Eastville.

Table 9.7 - The long-term financial outlook for Admin buildings

Location	Backlog to 2024	Future Years (2025-2034)	Total	AARI
Boyd Center	$246,625	$1,614,585	$1,861,210	$186,121
Restoration Services	$37,500	$1,473,105	$1,510,604.96	$151,061
Dave Barrow Centre for Conservation	$71,040	$925,086	$996,126	$99,613
Total	**$355,165**	**$4,012,776**	**$4,367,942**	**$436,795**

Cumulatively, the average annual required investment (AARI) of $436,795 is in line with the estimated budget of $500,000 allocated to the Administrative Facilities. However, the actual annual expenditures would vary by year depending on the planned projects. Figure 9.4 provides a visual breakdown of the expenditures by year against the allotted annual budget.

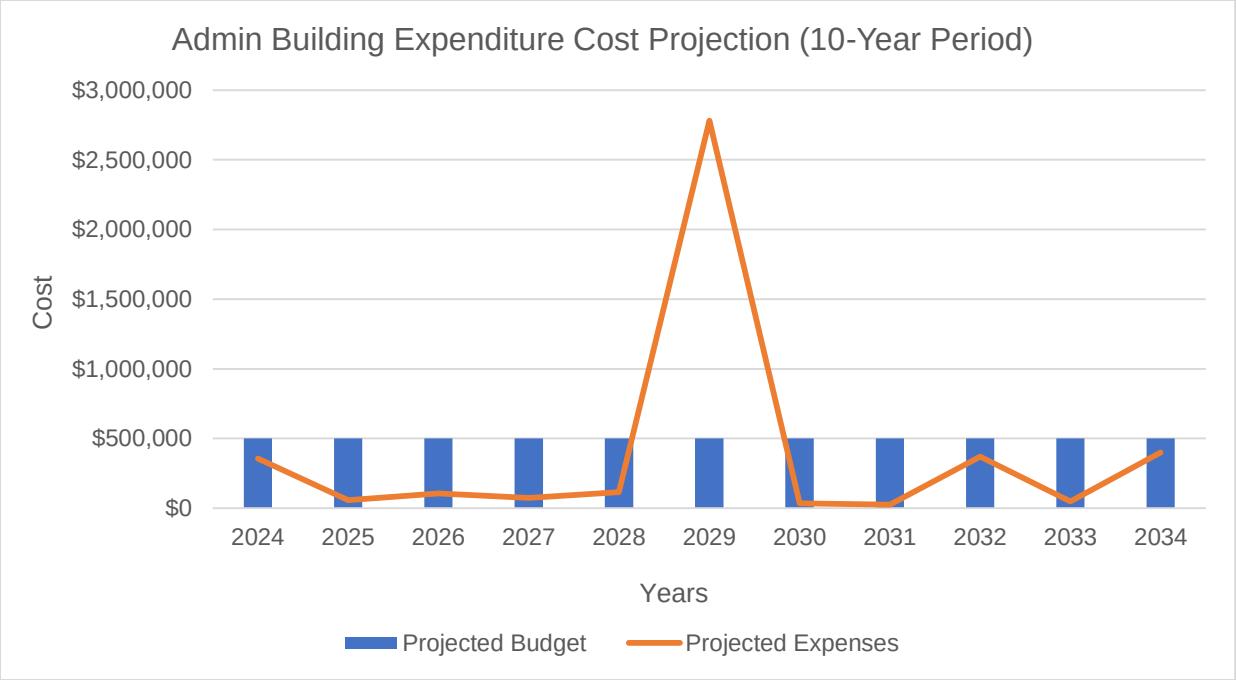


Figure 9.4 - Admin Building Expenditure Cost Projection

Based on the above figure, it is evident that a funding shortfall will occur in the year 2029. This could lead to a significant deterioration in the condition of the Administrative Buildings. If not planned effectively the deterioration can lead to significant negative impacts on the expected service levels of these assets.

A combination of the below mitigation measures can be used to ensure that the condition of the Administration Buildings portfolio remains within the target range of Good – Fair.

- Undertake certain capital projects, based on criticality, prior to 2029 to take advantage of the budget surplus.
- Alternatively, support the capital reserves from the surplus budget in anticipation of the funding shortfall in 2029.
- A combination of the above measures to align the budget to the expected annual expenditure, via long term capital planning, to avoid large funding gaps/surpluses year after year.

9.10 Sustainability

TRCA is actively committed to the pursuit of construction excellence while balancing sustainability and environmental stewardship.

The new TRCA Head Office building is a project that will set a benchmark for sustainable design in commercial buildings. Construction of the 8,100 square meter, four-story office building with a mass timber structural system will meet a number of environmental standards, including the Toronto Green Standard Tier II (v3) certification, the Leadership in Energy and Environmental Design (LEED) Platinum certification and the WELL Silver certification (v2).

The project also achieved the Canada Green Building's Council's Zero Carbon Design Designation in

October 2023 and was also awarded the 2023 Ontario Embodied Carbon Award for new construction via the Carbon Leadership Forum.

The RSC has many sustainability features incorporated as it was designed to be a showcase for sustainable building design. It has LEED Platinum Certification.

Residential Buildings

SECTION 10: BUILDINGS - RESIDENTIAL

Introduction

TRCA's approximately fifty (50) residential properties are located at various areas within its jurisdiction, including as far north-east as the Township of Uxbridge; bordering the City of Toronto; and as far north-west as the Town of Caledon.

State of TRCA's Residential Assets

TRCA acquired its first residential property in approximately 1969, and leasing began shortly thereafter. Over more than 50 years, TRCA acquired greenspace lands with residential building structures situated on the properties that were tenanted during acquisition or subsequently leased to tenants in an effort to generate revenue and offset the maintenance and capital costs associated with state-of-good repair. While the cost-benefit analysis historically worked-out favorably for TRCA, the results of comprehensive residential building condition assessments suggest nearly **56 % of the residential building portfolio is in Fair to Good condition.**

10.1 Asset Inventory

The York Region has the largest concentration of TRCA's Residential Buildings followed by Peel, Durham, and Toronto. The Residential Buildings portfolio is outlined in the table below based on each jurisdiction.

Table 10.1 - Residential Building Inventory

Jurisdiction	Asset Count	Percentage of Portfolio
Durham	10	20%
Peel	15	30%
Toronto	5	10%
York	20	40%
Total	**50**	**100%**

It is important to note that the above inventory is inclusive of 1 building that is out of service, however it is yet to be demolished or decommissioned.

10.2 Asset Valuation

The Current Replacement Value (CRV) is used to calculate the replacement cost for each of the residential buildings. CRV rates are based on constructing a replacement building of similar size, type, and construction and do not include land value.

The CRV of TRCA's Residential Buildings Portfolio has been calculated using the Residential Construction indices from Statistics Canada as an escalation factor. Based on the available CRV data from Q3 2021, the replacement costs of the buildings have been escalated by a factor of 38.1% as of Q4 2023.

Table 10.2 - Residential Building – Replacement Cost

Jurisdiction	Asset Count	2023 Replacement Value ($)
Durham	10	$6,109,986
Peel	15	$11,338,361
Toronto	5	$1,776,094
York	20	$14,136,433
Total	**50**	**$33,360,876**

As outlined in Table 10.2, assets in York and Peel make up approximately 75% of TRCA's residential portfolio valuation at $14.13 million and $11.34 million, respectively.

The value of residential assets is heavily dependent on the market conditions and is much more responsive to the changes in interest rates as compared to other asset types. It is important to review the valuation of this asset class on a frequent basis to ensure the mitigation of insurance risks to the portfolio.

Table 10.3 - Residential Building Replacement Valuation

Service	Asset	Inventory	Unit	Replacement Value
Residential 	Residential Buildings	50	Each	$33,360,876.86
TOTAL				**$33,360,876.86**

10.3 Asset Age Summary

The average age of the assets within the Residential portfolio is approximately 68.5 years. From a jurisdictional perspective, on average, Durham Region has the oldest buildings and York Region has the newest buildings. Table 10.4 provides a summary of the average age of the residential assets.

Table 10.4 - Residential Building Inventory

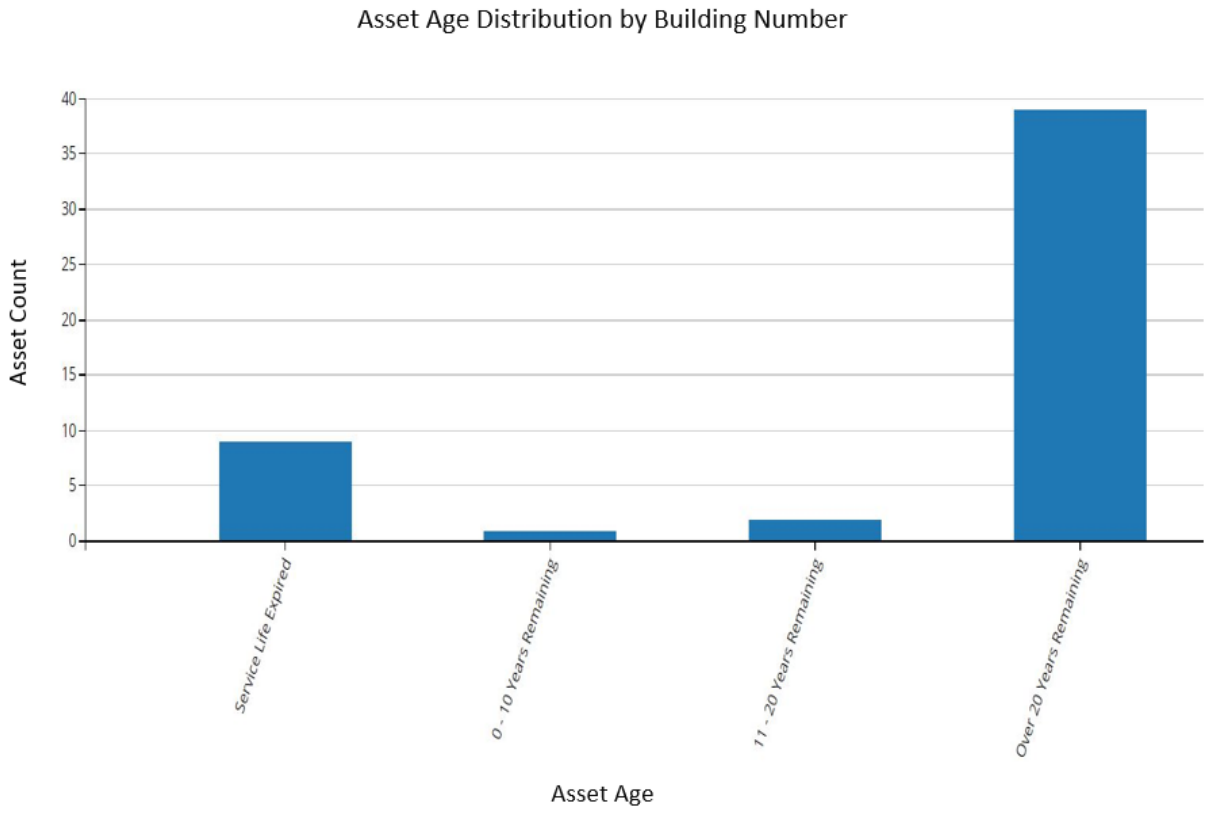
Jurisdiction	Average Age (Years)
Durham	79

Jurisdiction	Average Age (Years)
Peel	72
Toronto	69
York	61
Portfolio Average	**68**

In addition, using Building Condition Assessments, the Estimated Service Life (ESL) for Residential Buildings is used in order to benchmark against industry standard as well as determine a suitable asset management plan to maintain or improve the current conditions of these assets.

As shown in Figure 10.1, approximately 20% of the Residential Buildings are past or close to past their expected useful life while 80% of the portfolio has between 11 to over 20 years of useful life remaining.

Figure 10.1 - Estimated Service Life (ESL) for Residential buildings



10.4 Asset Condition

The Residential Buildings are maintained through condition assessments carried out by qualified assessors. A comprehensive condition assessment of the Residential Portfolio was completed in late 2021. A five-point Facility Condition Index (FCI) rating was used to assign an overall condition to each asset. The FCI Ratio is a combined maintenance costs and/or capital repairs over a three-year period (deferred maintenance), divided by the Current Replacement Value. The Ratio illustrates the global state

or condition of each asset at the time of inspection. Higher values represent increasingly degraded overall building conditions and as a result greater capital budget requirements to maintain each asset.

The breakdown of TRCA's Residential Portfolio by jurisdiction in reference to the FCI rating scale is shown in Table 10.5

Table 10.5 – Portfolio Condition by Jurisdiction

Jurisdiction	Condition Rating	Asset Count	Average of FCI Ratio
Durham	Fair	4	8%
	Good	2	3%
	Poor	4	13%
Peel	Fair	5	8%
	Good	3	4%
	Poor	7	15%
Toronto	Fair	3	8%
	Good	1	5%
	Poor	1	20%
York	Fair	3	7%
	Good	7	3%
	Poor	10	16%
Total		**50**	**100%**

56% of the assets are in **Fair to Good** condition indicating that they are meeting current requirements, but many are starting to show signs of deterioration with 44% of them in **Poor** to **Very Poor** condition, indicating significant investment will be required to maintain these assets at an acceptable level.

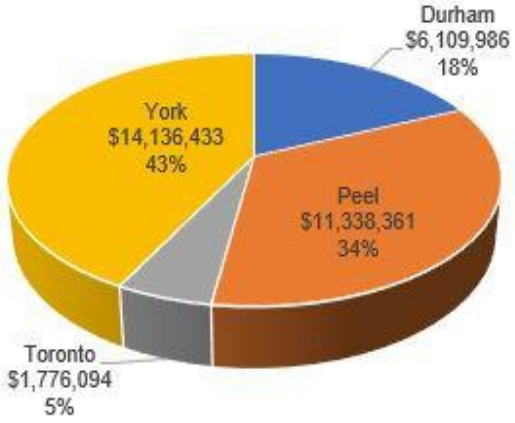
Without near-term investment, buildings with a poor rating, already near or at obsolescence, will quickly descend into the Very Poor category where safe occupation is no longer guaranteed. In other words, major elements and structures of these buildings are no longer functioning as designed. Having reached their life expectancy, major renovations, replacements, or demolition are required in the near term.

The overall current FCI rating for residential buildings is 10%. However, the overall FCI Rating over the next 10 years is expected to rise. High FCI ratings have a strong near-term level of service impact. Generally, large deferred maintenance amount correspond to worsening overall FCI Ratings, resulting in business case evaluations that likely to lead to removal from service or liquidation decisions.

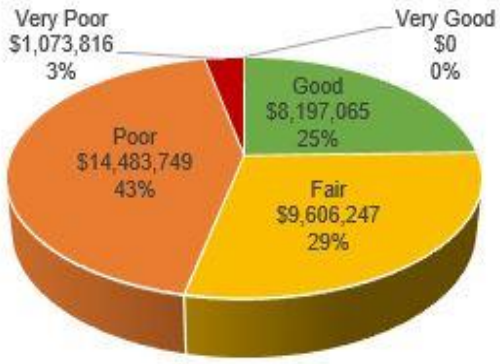
Total Asset Replacement Value:	**$ 33,360,876.86**
Current Condition:	Fair
Future Condition Trend (Next 10 years):	Decreasing
Asset Management Policy:	Create complete communities that integrate nature and the built environment into the Toronto region's economy.
Assets Included in this Category:	50 Residential Buildings
Data Confidence and Reliability:	Condition Based: Medium

FCI Ratios is largely attributable to early building construction dates (1906). Although several residential buildings exceed 100-years of age, the median construction date for the buildings in the residential portfolio is with an average age of 66 years. Fifty-four percent of residential buildings is rated fair or better.

REPLACEMENT VALUE



CONDITION OF RESIDENTIAL BUILDING ASSETS



10.5 Levels of Service

Residential building service levels, more generally – inhabitability, are assessed in a qualitative and quantitative manner. While qualitative results are based upon subjective observations, quantitatively LOS are evaluated through completed building condition assessments that produce a general state of good repair analysis. This approach is balanced against the TRCA's strategic livability and sustainability objective, which promotes reduced environmental impact and increase assets resilience.

The Legislative Levels of Service impacting TRCA's Residential Buildings is outlined below:

- **O. Reg. 517/06: Maintenance Standards**
    - Mandates the standard to which facilities are maintained i.e., the minimum condition
- **Residential Tenancies Act 2006**
    - Outlines roles and responsibilities of landlords and tenants, balance the rights and responsibilities of residential landlords and tenants, and provides for the adjudication of disputes and for other processes to informally resolve disputes.
- **Building code**
    - The Building Code Act is an Ontario regulation that describes the requirements for built facilities.

Table 10.6 – Customer Level of Services – Residential Buildings

Areas Classes	Corporate LOS Description	Values	Customer LOS Measure	Customer LOS Performance	Target
Facilities	Investing in existing infrastructure to provide safe, accessible, and functional facilities to the public.	**Quality**	Providing facilities in acceptable condition in fair or better condition	54%	
		Customer Service	% of Response times to On-Demand Requests for Facilities Maintenance	100%	

Table 10.7 – Technical Level of Services – Residential Buildings

Areas Classes	Corporate LOS Description	Values	Technical LOS Measure	Technical LOS Performance	Target
Facilities	Investing in existing infrastructure to provide safe, accessible, and functional facilities to the public.	**Quality**	FCI of facilities	9.84%	
		Customer Service	% of all demand maintenance work orders completed within standard (30 days)	100%	

	Positive Upward		Positive Downward		No Change

Provided the existing residential buildings continue to age as projected, and documented in building condition assessments, established levels of service provided currently to residential tenants is likely to continue. Strategic service level attributes are regularly reviewed, monitored, and maintained by TRCA maintenance personnel in a collaborative manner with customers. Still, the greatest impact to strategic service level attributes in the medium term is the financial viability of the residential building portfolio.

10.6 Asset Management Strategy

Table 10.8 below highlights five inter-connected elements that impact the Asset Management Strategy for the Residentail assets. Each section illuminates qualatative customer service desires while simultaneously guiding the applicant through a quantatitive analysis. Understanding customer needs, for instance, may lead to specific financially feasible building enhancements that impact service levels, building performance and ultimately measureable deliverables. Effective service level measurements contemplate service level developments, along with customer desires and expectations, and resource constraints.

Table 10.8 – Elements that impact Asset Management Strategy

Understand Customer Needs	Basic Maintenance Requirements What do Customers Value
Service Level Development	Expand, Maintain or Reduce Services to Tactical Considerations
Performance Measures	Create and Track Strategic Metrics Devise GAP Analysis
Customer Consultation	Bridge Expectation-Outcome Gap(s) Service Level Review

Understand Customer Needs	Basic Maintenance Requirements What do Customers Value
Deliver / Adjust Outcomes	Communicate Service Level Changes Communicate Deliverable Gaps

Utilizing a mix of the factors outlined in Table 10.8, lifecycle activities for the Residential Building Portfolio primarily includes the following:

Maintenance Activities

Including regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected breakdown events:

- Completing planned maintenance activities while managing the need to execute reactive maintenance activities.
- Have enough resources available to complete a series of unplanned, required urgent work requests that are submitted:
- Level 1 (Emergency): within 1 day (ex. Plumbing leak, no hydro, roof leak, no water etc.)
- Level 2 (Urgent Service): within 1-3 days (ex. Broken windows/doors, pest control, appliance repair etc.)
- Level 3 (Necessary Service): within 3-5 days (ex, filter change, electrical switches, fixtures)

Renewal/Rehab Activities

Significant repairs are designed to extend the life of the asset. Residential buildings are regularly evaluated through comprehensive condition assessments, which establish and update an industry-standard Facility Condition Index (FCI) score that accurately reflects the overall condition of each facility (divided into components of building envelope, mechanical and electrical systems, etc.). These condition assessments are used to determine the cost and timing of renewal requirements.

Disposal Activities

Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer required by TRCA or municipality. Appropriate and proper disposal occurs when assets are replaced or renewed. In 2023 two of the residential buildings are out of service, one of them is demolished and the other is out of use as it is not functioning as intended.

Service Improvement Activities

Planned activities to improve an asset's capacity, quality, and system reliability. Consultation with tenants and residential building end-users determines future service improvement needs.

10.7 Financial Strategy

As of 2023, the deferred maintenance for the portfolio stands at approximately $3.096 million. Furthermore, over the past three years (2021 -2023), on average, 38% of the nearly $900,000 in gross revenues was spent on preventative maintenance and lifecycle capital repairs.

Considering the quantum of deferred maintenance as well as the age of the buildings it is expected that the future repair cost trajectory will climb significantly on a year-over-year basis. This will have a direct impact on the expected service levels.

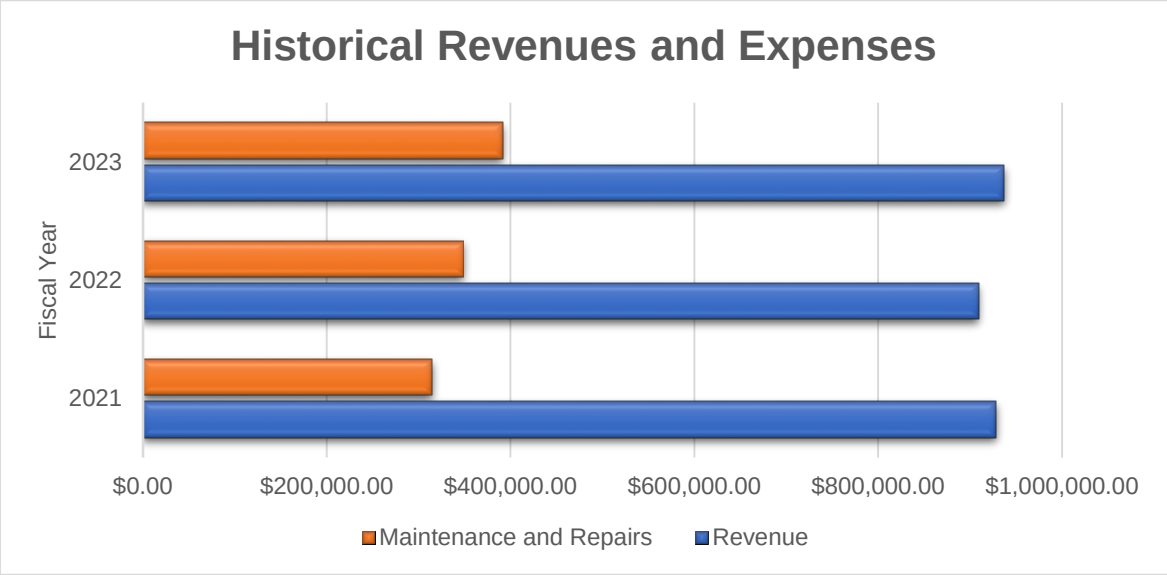


Figure 10.3 Historical Revenue and Expenses

The total maintenance expenditure from 2024 – 2034 is estimated to be $ 9.15 million. Since expenses are not uniform across all years, continuing to fund maintenance from annual aggregate building revenues ensures adequate cashflow for all repairs through annual budget plans. However, the building portfolio would likely experience intermittent budgetary challenges, based on revenue, in at least four of the next ten years.

Table 10.9 – Annual Capital requirement by Jurisdiction.

Fiscal Year	Durham	Peel	Toronto	York	Total
2024	$ 97,243	$ 156,850	$ 24,553	$ 234,009	**$ 512,655**
2025	$ 137,425	$ 164,027	$ 20,145	$ 536,614	**$ 858,211**
2026	$ 330,143	$ 558,453	$ 110,652	$ 747,853	**$ 1,747,101**
2027	$ 77,119	$ 192,627	$ 22,150	$ 251,537	**$ 543,433**

Fiscal Year	Durham	Peel	Toronto	York	Total
2028	$ 77,501	$ 328,373	$ 35,661	$ 384,303	**$ 825,838**
2029	$ 107,341	$ 225,831	$ 23,393	$ 266,386	**$ 622,951**
2030	$ 15,361	$ 212,003	$ 41,400	$ 228,675	**$ 497,439**
2031	$ 284,089	$ 668,104	$ 132,105	$ 1,011,238	**$ 2,095,536**
2032	$ 67,308	$ 257,824	$ 10,496	$ 282,386	**$ 618,014**
2033	$ 63,479	$ 209,332	$ 34,026	$ 263,833	**$ 570,670**
2034	$ 25,780	$ 65,410	$ 17,920	$ 151,913	**$ 261,023**
Total	**$ 1,282,789**	**$ 3,038,834**	**$ 472,501**	**$ 4,358,747**	**$ 9,152,871**

As shown in Figure 10.4, the long-term (2024-2034) year-over-year financial outlook for the residential building portfolio appears more challenging. The following chart indicates that maintenance and capital repair costs in 2026 and 2031 exceed gross revenues for those years.

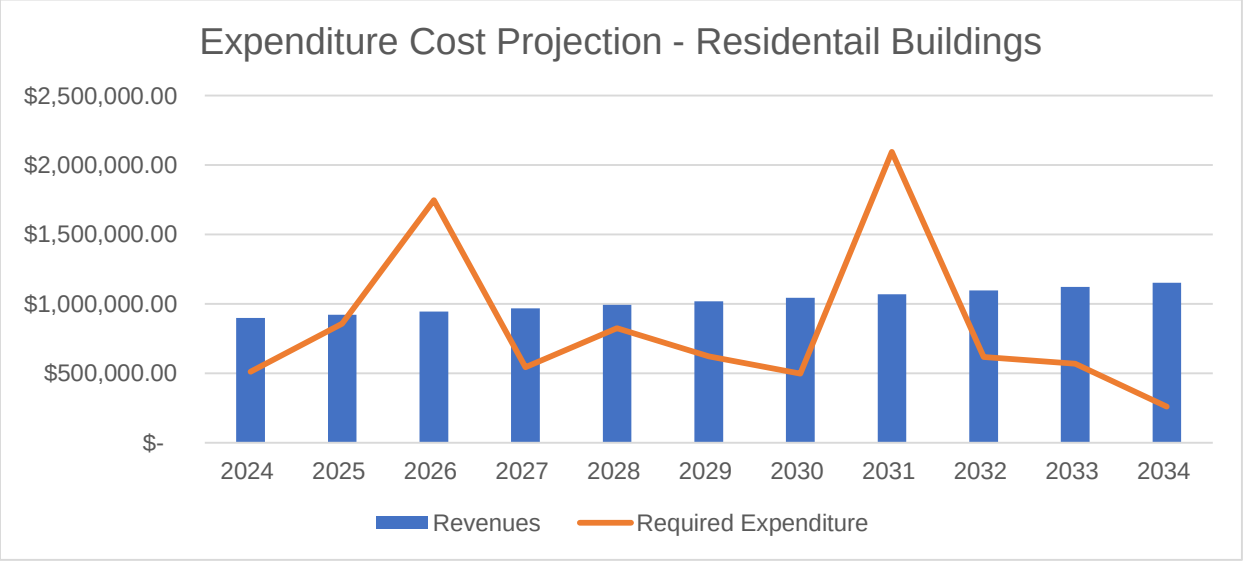


Figure 10.4 - Residential Building Expenditure Cost Projection

Over the period of 2024 – 2034, assuming the actual spend on repairs and maintenance remains constant at 38% of gross revenues with an 2.5% annual escalation, the total expenditure incurred would be approximately $4.37 million. In comparison, the required spending over the same period would be approximately $9.15 million. The deferred maintenance that currently stands at $3.06 million would increase by 56% to $4.78 million.

As a result, the existing stock of residential buildings may diminish over time particularly when resources are not applied judiciously to state of good repair maintenance across the entire portfolio. This in turn leads to revenue pressures on the portfolio which assumes the current revenues of approximately $900,000 escalated at a conservative 2.5% annually over the period of 2024 – 2034.

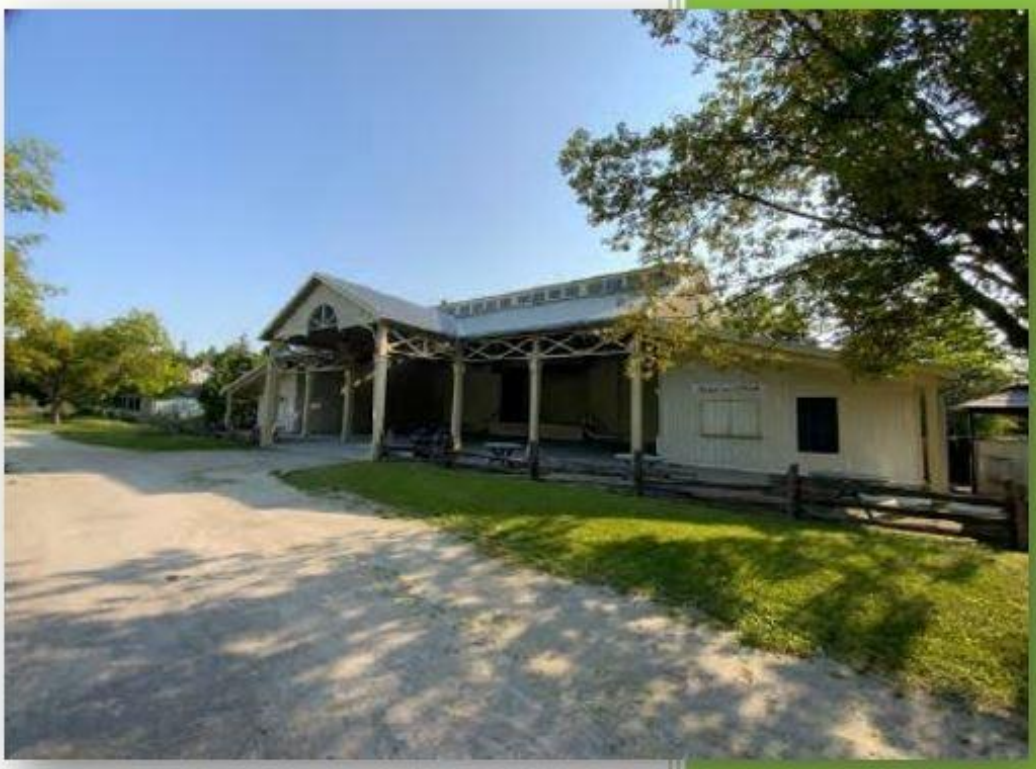
A generally accepted or best practice funding gap standard for either municipal or residential buildings remains largely unestablished. While most municipal funding is linked to local levies, non-municipal

entities who manage building assets for which municipal funding is unavailable often depend entirely upon end-user revenue to maintain existing service levels.

In the absence of periodic funding injections, a combination of the below mitigation measures can be used to ensure that the condition of the Residential Buildings portfolio remains within the target range of Fair.

- Undertake certain capital projects, based on criticality, prior to 2026 and 2031 to take advantage of the revenue surpluses in preceding years.
- Increase the percentage of spent on capital repairs and maintenance as a function of the annual revenues. Currently at 38%.
- Alternatively, support the capital reserves from the surplus budget in anticipation of revenue shortfalls.
- Undertake a holistic portfolio analysis to divest certain Residential assets via a phased approach to provide timely cash injections that can be invested back to minimize deferred maintenance and/or reduce the capital repair liabilities.

Parks Facilities



SECTION 11: BUILDINGS - PARKS FACILITIES

Introduction

TRCA's Park Facilities included in this AMP are located within 13 TRCA owned Conservation Parks that span over 3,209 hectares. They play an important role in contributing to healthier and greener communities, part of the outcomes achieved by actioning TRCA's Strategic Plan.

Park amenities include, but are not limited to, a network of trails and pathways, gardens and natural areas, a variety of sports fields and playground equipment, entertainment venues, pools, public facilities, and washrooms. Our investment in these assets helps to build community capacity, improve health and physical activity levels, and enhance the overall quality of life for watershed residents and visitors.

This section includes the Parks Facilities located across TRCA's jurisdiction with a specific focus on public-facing building assets.

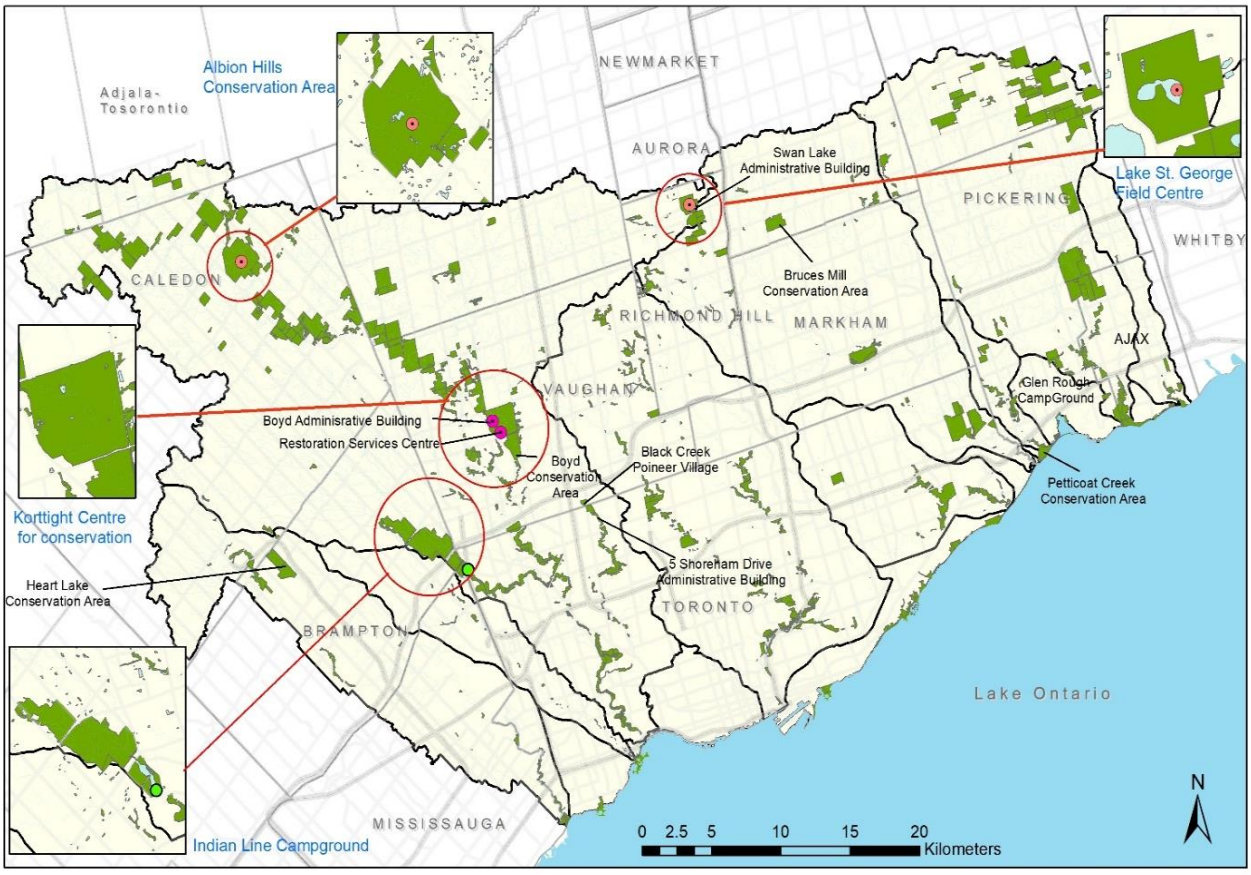


Figure 11.1 - Parks Facilities located across TRCA jurisdiction.

State of TRCA's Public Facing Parks Assets

11.1 Asset Data Inventory

TRCA Parks Facilities included in this AMP are permanent structures located throughout TRCA's Conservation Parks, and Campgrounds. The Park Facilities category includes Administration Gates, Field Centres, Education Centres, Chalets, Pool Buildings and Splash Pads, Maintenance Workshops, Pumphouses, Washrooms, Comfort Stations, Barns, Picnic shelters and Sheds (miscellaneous structures).

The Park Facilities are located in the below Conservation Parks:

• Albion Hills Conservation Park • Kortright Centre for Conservation • Indian Line Campground • Heart Lake Conservation Park • Boyd Conservation Park • Village at Black Creek • Petticoat Creek Conservation Park	• Glen Haffy Conservation Park • Claireville Conservation Area • Bruce's Mill Conservation Park • Claremont Nature Centre • Lake St. George Field Centre • Tommy Thompson Park

The asset data inventory for Parks Facilities is managed through an Enterprise Asset Management (EAM) database and in GIS databases. The data in the system was populated after the completion of third-party building condition assessment (BCA) reports in Q3 2021.

The make-up of the asset portfolio across 13 Conservation Parks spanning the entirety of TRCA's jurisdiction is outlined in Table 11.1

Table 11.1 - Parks Facilities – Asset Inventory across TRCA's jurisdiction

Jurisdiction	Park Name	Asset Count
Durham	Claremont Nature Centre	4
	Petticoat Creek Conservation Park	13
		17
Peel	Albion Hills Conservation Park	38
	Claireville Conservation Area	4
	Glen Haffy Conservation Park	17
	Heart Lake Conservation Park	19
	Indian Line Campground	7
		85
York	Boyd Conservation Park	17
	Bruce's Mill Conservation Park	12

Jurisdiction	Park Name	Asset Count
	Kortright Centre for Conservation	21
	Lake St. George Field Centre	10
		60
Toronto	Village at Black Creek not including the historical buildings	6
	Tommy Thompson Park	5
		11
Grand Total		**173**

11.2 Asset Valuation

The Current Replacement Value (CRV) rates are based on constructing a replacement building of similar size, type, and construction and do not include land value.

The CRV of TRCA's Parks Buildings Portfolio was identified at the completion of the BCAs commissioned in 2021. The valuation has been calculated using the Non-Residential Construction indices from Statistics Canada as an escalation factor. Based on the available CRV data from Q3 2021, the replacement costs of the buildings have been escalated by a factor of 24.9% as of Q4 2023.

Table 11.2 - Parks Facilities – Current Replacement Value

Region	Park Name	CRV
Durham	Claremont Nature Centre	$ 2,612,239.79
	Petticoat Creek Conservation Park	$ 2,476,883.16
		$ 5,089,122.94
Peel	Albion Hills Conservation Park	$ 25,102,168.84
	Claireville Conservation Area	$ 1,497,188.79
	Glen Haffy Conservation Park	$ 1,178,898.63
	Heart Lake Conservation Park	$ 2,602,928.49
	Indian Line Campground	$ 1,912,435.08
		$ 32,293,619.83
York	Boyd Conservation Park	$ 2,250,248.36
	Bruce's Mill Conservation Park	$ 4,705,323.98
	Kortright Centre for Conservation	$ 12,070,030.00
	Lake St. George Field Centre	$ 3,949,981.24

Region	Park Name	CRV
		$ 22,975,583.57
Toronto	Village at Black Creek	$ 14,846,863.00
	Tommy Thompson Park	$ 972,309.03
		$ 15,819,172.03
Grand Total		**$ 76,177,498.38**

11.3 Asset Age

As of the end of 2023, the average age of the Parks Facilities is approximately 36 years while the average expected useful life is approximately 49 years.

Table 11.3 – Parks Facilities – Average age by park

Park Name	Average of Current Age (Years)	Average of Estimated Useful Life (Years)	Average of Service Life Remaining (Years)
Albion Hills Conservation Park	36	42	6
Black Creek Pioneer Village	22	53	30
Boyd Conservation Park	36	44	7
Bruce's Mill Conservation Park	36	53	18
Claireville Conservation Area	38	64	26
Claremont Nature Centre	45	58	13
Glen Haffy Conservation Park	38	46	8
Heart Lake Conservation Park	27	42	14
Indian Line Campground	45	75	30
Kortright Centre for Conservation	33	49	16
Lake St. George Field Centre	66	63	- 3
Petticoat Creek Conservation Park	37	47	10
Tommy Thompson Park	13	53	40
Grand Total	**36**	**49**	**13**

A granular examination of the asset age highlights that approximately 24% of the assets within this portfolio are past their estimated useful life. Albion Hills Conservation Park has the largest concentration of these assets at 30%. As a percentage of the total assets by Park, Lake St. George has 40% of assets

that are past their expected useful life.

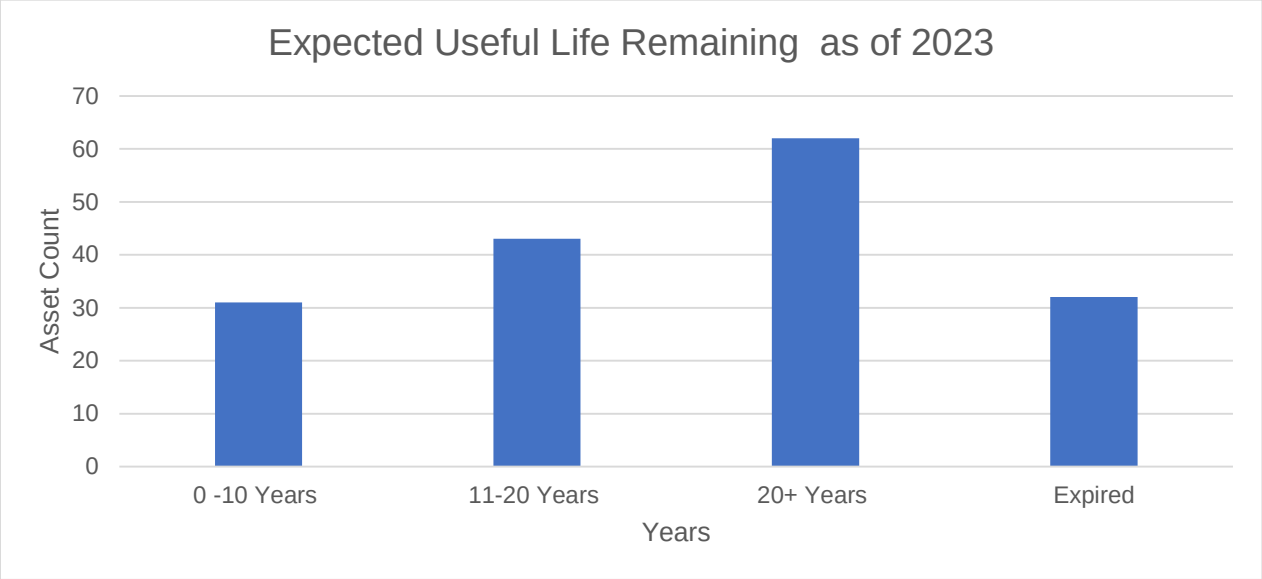


Figure 11.1 – Parks Facilities - Asset count by Expected Useful Life remaining

11.4 Asset Condition

Overall, the buildings within the Parks Facilities portfolio are in **Good to Fair Condition** based on the Facilities Condition Index (FCI) rating which is a ratio of deferred maintenance to current replacement value for an asset. This signifies that the assets and their components are functioning as intended with a normal rate of deterioration and minor distress is observed. It should be expected that the repair costs will increase steadily over the next 5 years due to continued wear and tear as a result of normal use.

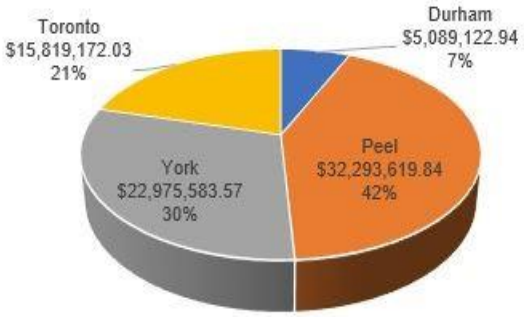
Table 11.4 - Parks Facilities Condition and associated Current Replacement Value

Asset Condition	Asset Count	Current Replacement Value
Very Good	4%	$ 6,229,847
Good	57%	$ 57,837,845
Fair	27%	$ 9,498,358
Poor	8%	$ 2,196,290
Very Poor	4%	$ 415,158
Grand Total	**100.00%**	**$ 76,177,498**

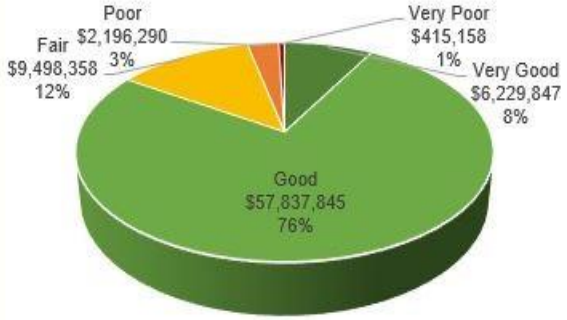
Total Asset Replacement Value:	$ 76,177,498.38
Current Condition:	Good
Future Condition Trend (Next 10 years):	
TRCA Strategic Plan:	"Healthy connected communities" and "Accessible nature".
Assets Included in this Category:	Field and Education Centre's, Chalets, Pool Buildings and Splash Pads, Workshops, Washrooms, Barns, Picnic Shelters, Sheds & Gate houses
Data Confidence and Reliability:	Condition Based: Medium

The total replacement value of TRCA Park Facilities is $76,177,498.38 million. The 84% of the assets are in Good to Very Good condition, and 12% are in Fair condition, with the remaining assets close to, or past, the end of Service Life. As the TRCAs Park Facilities assets are overall in Good condition, these assets are meeting current needs but aging and may require attention.

REPLACEMENT VALUE BY REGION



CONDITION OF PARK FACILITIES ASSETS



11.5 Level of Service

TRCA's strategic plan identified several objectives related to parks' facilities' levels of service. These objectives are to maintain, develop and upgrade parks facilities as community hubs, and to complete asset management and state of good repair assessments and improvements. Parks facilities' levels of service are influenced by many legislative and regulatory requirements such the Ontario Building Code and the Accessibility for Ontarians with Disabilities Act.

TRCA has developed its own set of unique level of service performance metrics that are used to reflect citizen values and needs. These metrics are classified below through service attributes (value) provided and summarize the type of service being provided to citizens and their wider communities.

11.5.1 Customer LOS

TRCA is developing a comprehensive desired LOS for its Parks facilities.

Based on current information, facilities and buildings generally range from "good" to "fair" condition; however, LOS can be impacted by external trends and building systems are influenced by legislative and regulatory requirements. As these changes occur, updates to the AMP will consider their impacts on LOS, which may also affect lifecycle strategies. Specific examples include:

- Future facility expansions and conversions that respond to future trends;
- Compliance with the Ontario Building Code (OBC);
- Conformity to the Accessibility for Ontarians with Disabilities Act (AODA);
- The Occupier's Liability Act requirements;
- Consideration of green building designs integrating energy and water conservation measures;
- Fire and Life Safety issues will be addressed immediately upon notification of the concern;
- Creative partnership opportunities in their construction and/or operation

From an asset management perspective, continuous monitoring of facility usage would allow for a better understanding of the needs of the community and the intended use of the facilities. This will be accomplished by tracking the use and availability metrics which would serve as an indicator to confirm that the asset service and maintenance are aligned to usage. Table 11.3 summarizes information on customer and technical measures for levels of service that relate to the operation, maintenance, and renewal of assets for the sustainment of Parks Facilities' current LOS.

Table 11.3 – Parks Facilities - Customer Levels of Service

Asset Class	Customer LOS Objective	Value	Customer LOS Measure	Customer LOS Performance	Target
Facilities	Connect communities to nature and greenspace. TRCA ensures that the public has access to accessible outdoor recreation and programming.	**Quality**	Providing facilities in in Fair or better condition	84%	⇔
		Customer Service	% of Response times to On-Demand Requests for Facilities Maintenance	100%	↑
		Environmental Stewardship	Minimize energy usage and costs. Providing facilities that are environmentally conscious.	13 CA	↑
↑	**Positive Upward**	↓	**Positive Downward**	⇔	**No Change**

11.5.2 Technical LOS

The technical LOS defines the technical requirements needed to achieve the level of service objectives through the use of quantifiable metrics and technical expertise. O. Reg. 588/17 also requires legislated technical levels of service for assets. Technical levels of service use metrics to measure the scope or quality of service being delivered by an asset. Legislation and regulations set standards, many relating to safety and reliability, which TRCA is legally obligated to meet and keeps information on regulatory inspections and compliance. Typically, the details are maintained at the operational level and confirmation of compliance is reported at a higher level.

Table 11.4 – Parks Facilities - Technical Levels of Service

Asset Class	Technical LOS Description	Value	Technical LOS Description	Technical LOS Performance	Target
Facilities	Connect communities to nature and greenspace. TRCA ensures that the public has access to accessible outdoor recreation and programming	**Quality**	FCI of facilities	21.41%	↓
		Customer Service	% of all demand maintenance work orders completed within standard (30 days)	95%	↑
		Environmental Stewardship	Annual electricity consumption (kWh)	3,595,417	↓
			Annual natural gas consumption (m3)	116,649	↓
			Annual water consumption (m3)	61,288	↓
			Annual propane consumption (Liters)	70,129	↓
↑	**Positive Upward**	↓	**Positive Downward**	↔	**No Change**

11.6 Asset Management Strategy

11.6.1 Lifecycle Management Strategy

This section focuses on specific activities to maintain the levels of service previously outlined. TRCA knowledge and understanding is continually improving through the collection and utilization of data that informs decision making related to asset lifecycle system and LOS performance metrics.

For Parks Facilities, risks relating to building infrastructure failure are mitigated through inspection and maintenance programs, which provide the necessary data to ensure that the work required to achieve the established LOS is identified. Renewal of assets is driven by BCAs, facility operator reviews on site,

planned site walk-through inspections, and input from the program department.

The development of appropriate and cost-effective strategies is foundational for ensuring service sustainability. Further, the lifecycle management activities reduce the risks to service delivery and performance. Some of the Parks Facility assets have a run-to-failure life cycle while others have a more complex approach to lifecycle which includes rehabilitation before a full reconstruction in order to sustain the asset to the end of its anticipated estimated service life.

11.6.2 Lifecycle Activities

Non-Infrastructure Solutions

- Encouragement of conservation of Parks Facilities and associated infrastructures assets through policy, procedures, public outreach, etc.
- Review the capital and operating costs and plans.
- Develop and maintain Parks and Facility Master Plans.

Maintenance Activities

- Maintenance is intended to prevent or mitigate the deterioration of performance of assets in service and manage risk of failures. Conducting routine and preventative maintenance activities contributes to ensuring preservation of existing assets; this includes inspections, testing, monitoring, and preventive maintenance regimes.
- A work order system and online interface exists for Parks TRCA employees to generate requests for Parks Facilities' maintenance and repairs.

Renewal/Rehab Activities

- Mid-life renewal of facilities and major overhauls and modernization of equipment to support department service.
- Changes to asset use and adjusting to changes in the number or type of customers and assets' Levels of Service.

Replacement Activities

- Demolition and replacement when the assets reach the end of useful life. As example, demolition of the existing maintenance shop building at Albion Hills Conservation Park and replacement with a newly constructed building.
- Coordinating multiple asset replacements through project bundling to reduce total costs where possible. For example, replacement of roof for the Chalet building and barn.
- Replacement may also be due to assets no longer meeting the service levels such as older windows at facilities that do not meet energy efficiency objectives with more energy efficient windows.

Expansion Activities

- Future facility upgrades and service enhancement based on demand and expected level of service.

Disposal Activities

- Decommissioning of abandoned or unused assets , some assets results in substantial cost at their end of life which may include demolition costs and land restoration costs and should be included in the total lifecycle costs of assets.
- A key aspect at this stage is how the financial, environmental, and social costs can be minimized during the disposal of an asset.

11.7 Current and Future Risks

Through workshops with Conservation Parks & Lands staff, asset types were placed into a framework based on the range of severity of the consequence of failure according to three types of impacts: social, environmental, and financial.

For this iteration of the asset management plan, risk was considered in terms of the impacts of asset failure that we recognize currently or have observed previously primarily related to the asset system or component failures due to age and lack of maintenance. Nevertheless, it is important to consider impacts from other risks in the future such as those from climate change.

We anticipate that climate change will impact our Parks Facilities assets in a variety of ways including increased demands for park use as a result of an increase in moderate temperatures throughout the year, and frequency or duration of extreme heat events that will place increased demand and reliance on parks for shade and cooling, and increased park closures or repairs as a result of an increase in extreme rainfall, wind, or winter events.

11.8 Financial Strategy

The Parks Building Facilities budget is guided by TRCA budget principles and involves the operation budget and capital budget.

The annual capital budget allocates funds each year for new assets, or rehabilitation and replacement of existing assets, and is funded primarily from municipal levy. The capital budget is used to plan and fund large expenditures including the construction of infrastructure assets with long life spans.

Primarily, the annual capital funds that are allocated for parks assets will include parks building facilities and parks linear infrastructure. Forecasted annual funds are identified in Table 11.5:

Table 11.5 – Parks Facilities - Forecasted annual capital funds

Regions and Municipalities	Forecasted funds
Peel	$ 1,649,000
Toronto	$ 371,000

The annual operating budget for Parks is approximately $780,000. These funds are used to support the day-to-day activities for operations and maintenance of Parks Facilities.

The annual operating and maintenance budget is funded primarily from multiple regions and municipalities to support the operation and maintenance for Parks Facilities assets. The breakdown of operating funds by municipality is in Table 11.6:

Table 11.6 – Parks Facilities - Forecasted annual operating funds

Regions and Municipalities	Estimated funds
Toronto	64%
York	22%
Peel	11%
Durham	3%

As of 2023, the backlog of deferred maintenance across Parks Building Facilities was approximately $11.7 million. Furthermore, the Average Annual Required Investment (AARI) for the next 10 years is estimated to be $4.4 million. In comparison, the expected average annual forecasted revenues are expected to remain between $2.0 million to $2.3 million over the next decade.

Not accounting for any ad-hoc grant funding and considering the quantum of deferred maintenance as well as the age of the buildings, it is expected that the future repair cost trajectory will climb significantly on a year-over-year basis. This will have a direct impact on the expected service levels.

Since expenditures are not uniform across all years, the portfolio would likely experience intermittent budgetary challenges, based on revenue, in at least four of the next ten years.

Assuming the AARI of $4.4 million against a revenue of $2.0 million, each year the backlog due to funding shortfall would be approximately $2.4 million. The deferred maintenance that currently stands at $11.7 million would increase to $35.7 million.

A generally accepted or best practice funding gap standard for Parks buildings remains largely unestablished. As outlined in Tables 11.5 and 11.6 above, TRCA does benefit from municipal funding, however, it is often not sufficient for the upkeep of an ageing portfolio and it is not received in all municipalities, which limits where it can be applied. Given the limitations around municipal funding, TRCA may need to explore alternate revenue streams that are supplemental and recurring to the current sources of user-generated revenues.

In the absence of periodic funding injections, a combination of the below mitigation measures can be used to ensure that the condition of the Parks Buildings portfolio remains within the target range of Fair.

- Prepone or package certain capital projects, based on criticality, to take advantage of the revenue surpluses.
- Utilize Corporate Capital Reserves to draw down the State of Good Repairs (SOGR) backlog which is currently at $11.7 million. This can be done using a phased approach to allow the replenishment of capital reserves.
- Alternatively, draw from the Corporate Capital Reserves for years where funding pressures are expected. This would assist in mitigating the ballooning of the SOGR backlog.

TRCA's Parks Facilities are overall in Fair to Good condition, indicating that assets are functional but showing signs of deterioration. Maintaining current investment will result in an infrastructure gap of approximately $35.7 million over the next decade. Failure to address the infrastructure gap could result in localized reductions to service, such as visual signs of deterioration, potential closure of amenities, high maintenance costs, etc.

Fleet - Vehicles and Equipment

SECTION 12: FLEET – VEHICLES AND EQUIPMENT

Introduction

TRCA Corporate Fleet (Fleet) provides a range of services across all divisions which rely on fleet assets to facilitate program operations and complete identified deliverables. The composition of Fleet varies across Divisions that have high demand for vehicles and equipment. Fleet is generally comprised of Licensed Motor Vehicles, Highway Trailers, Off-Highway Equipment, Marine Vessels, and General Equipment.

Table 12.9 - A high-level overview of TRCA's Fleet asset inventory included within the scope of the AMP (as of Q4, 2023).

Fleet Type	Quantity	% Of Total Fleet
Agricultural Equipment	91	18
Construction Equipment	74	15
On-Highway Vehicles (Owned)	135	27
Highway Trailers	34	7
Off-Highway Equipment	51	8
Marine	38	8
Off-Road Vehicle	39	8
Snow and Ice Removal	41	8
TOTAL	**503**	**100%**

Fleet has several key responsibilities. Primarily it is to manage corporately owned vehicles and equipment, in addition staff administer contracted fleet services and manage the acquisition and disposition of approximately 40 short-term rental vehicles annually. These vehicles cumulatively travel approximately 1.5 million kilometers annually. Staff also administer driver and equipment operator training and competency.

Fleet assets are spread widely across TRCA Divisions. Projects and programs with high equipment and administrative-related demands receive dedicated ongoing fleet vehicle and equipment resource allocations. Conversely, short-term projects and programs with intermittent demand cycles receive access to pooled resource vehicles through an internal reservation-based system that requires users to preschedule vehicle use.

State of TRCA's Fleet Assets

12.1 Asset Inventory

TRCA Corporate Fleet consists of approximately 503 assets divided into nine (9) primary categories.

Each category is maintained as per Original Equipment Manufacturers (OEM) specifications, tracked, and replaced as needed at the end of lifecycle by Property & Asset Management(PAM). The PAM group also maintains a detailed inventory of every asset, ongoing condition development and changes, projected maintenance, and lifecycle replacement costs. The table below provides a breakdown of TRCA's Fleet inventory by primary work location(s).

Table 110.2 - Provides a breakdown of TRCA's Fleet inventory and assignment Divisionally.

Division	Agricultural Equipment	Construction Equipment	Highway Trailers	Marine	Off-Highway Equipment	Off-Road Vehicle	On-Highway Vehicle	Snow and Ice Removal
Conservation Parks and Lands	21	2	3	0	36	23	16	20
Corporate Services	0	0	0	0	0	0	9	0
Development and Engineering Services	0	0	7	22	2	1	13	0
Education and Training	4	0	4	7	6	2	9	8
Policy Planning	0	0	2	0	0	2	9	0
Legislative and Property Services	0	0	0	0	0	0	18	0
CEO's Office	0	0	0	0	0	0	1	0
Restoration and Infrastructure	66	72	18	10	7	11	71	11
TOTAL	**91**	**74**	**34**	**38**	**51**	**39**	**135**	**41**

12.2 Asset Valuation

Proactive fleet management strategies are designed to realize lifecycle extensions of many TRCA assets over several years. Described further in the Financial Strategy section below, the purpose of the strategy is to build up reserves, in addition to maximizing return-on-investment. In general, the methodology utilized to calculate replacement values uses a standard 3.0% annual inflation rate over and above historic capital value. The following chart provides an overview of the dollar value of total current (Q4, 2023) fleet assets.

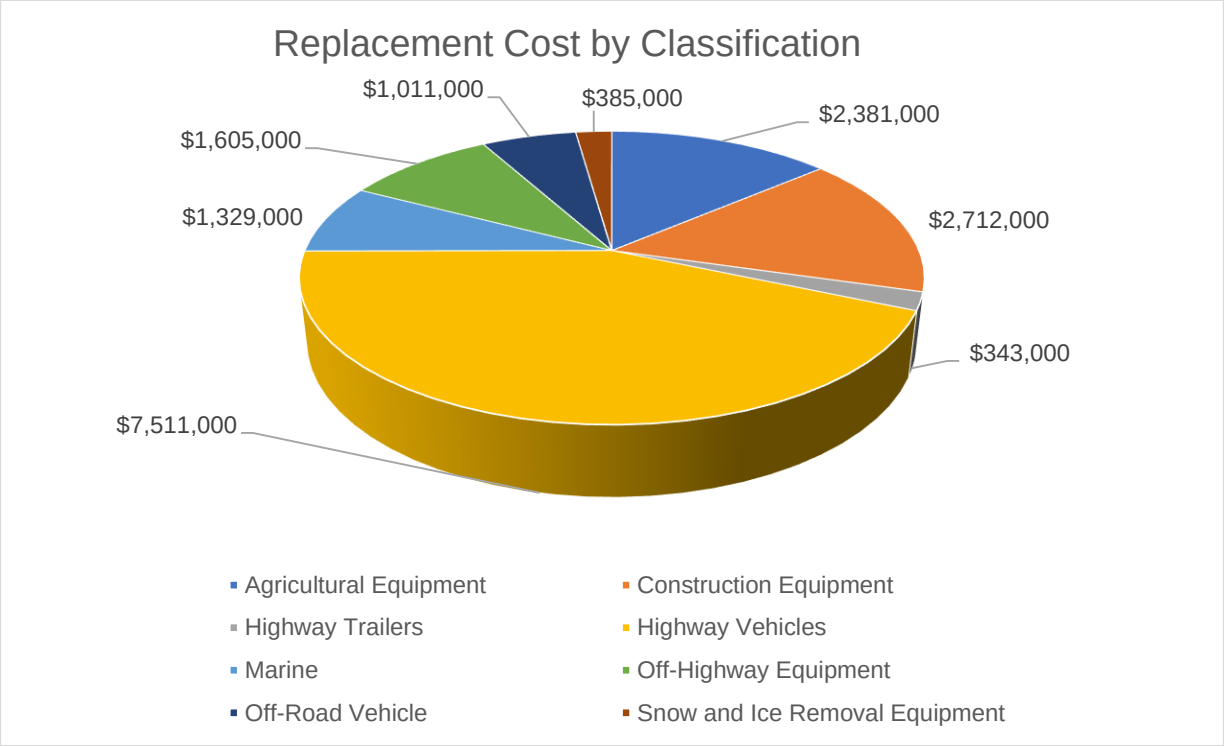


Figure 12.1 Provides a replacement value breakdown for the major fleet categories.

The replacement value of the existing Fleet is approximately $17,278,000 million. This value represents a realistic estimate of all TRCA fleet assets at the end of service life. Unless project or program deliverables change dramatically, lifecycle assets are replaced with similar vehicles and equipment.

The total replacement value of all primary asset categories within the corporate Fleet is shown in the table below.

Table 12.3 - Breaks down the replacement value of assets by Fleet type.

Fleet Type	Total
Agricultural Equipment	$ 2,381,000
Construction Equipment	$ 2,712,000
Highway Trailers	$ 343,000
Marine	$ 1,608,000
Off-Highway Equipment	$ 1,329,000
Off-Road Vehicle	$ 1,011,000
On-Highway Vehicle	$ 7,511,000
Snow and Ice Removal	$ 385,000
TOTAL	**$ 17,278,000**

Projected replacement costs are intended to establish the cost of future similar assets for budgeting purposes, replacement costs do not account for changes in asset type because of project and program growth, whereas changes to alternative fuel technologies i.e., Battery Electric Vehicle (BEV), and or adoption of Zero Emission Vehicle (ZEV) technology would be included in the projected replacement cost(s). Due to the recent increased costs of fleet assets seen across all manufacturing sectors which have outpaced inflation rates, replacement costs do not reflect current costs inclusive of current inflation, as its anticipated acquisition costs to return to near normal similar to that of historical inflation rates in future years.

To forecast capital funding requirements more accurately, where applicable, general aftermarket upfitting (vehicle customization for specific work-related requirements), such as truck bodies, lighting, van shelving etc., is included in the final purchase price to establish an overall replacement value for the asset. This replacement value is used to develop long-term funding needs.

12.3 Asset Useful Life

Optimal useful life of assets is established by vehicle and equipment manufacturers. Useful lifespan generally ranges between 8 – 15 years for On-Highway motor vehicles and between 10 – 50 years for assets in other primary categories.

However, several factors influence equipment and vehicle service life, such as work environment, terrain, vehicle load requirements, weather conditions, mileage accruals, and regular application of preventative maintenance. In general, TRCA regularly extends the service life of fleet assets beyond OEM expectations because they are used as intended and are well-maintained. The following table provides an overview of the expected service life for the five primary fleet categories.

Table 12.4 - Highlights the expected service life of Fleet assets by Fleet Type

Primary Fleet Type	Minimum (Years)	Maximum (Years)
Agricultural Equipment	12	15
Construction Equipment	15	50
Highway Trailers	10	15
Marine	10	25
Monitoring Equipment	10	15
Off-Highway Equipment	10	15
Off-Road Vehicle	10	15
On-Highway Vehicle	8	15
Snow and Ice Removal	10	15

While TRCA extends the useful service life of many assets, on average, lifecycle processes for most fleet assets are initiated with 25% residual service-life. That is, new vehicle and equipment acquisitions, and

eventual dispositions, begin at this stage to ensure new assets are operational when service life is exhausted. The overlapping period also provides enough time to train employees to use new equipment safely and to account for the fluctuating production and delivery schedules within the manufacturing sector. The entire process is effectively managed by utilizing OEM lifecycle consumption rates when forecasting failure rates and 10-year annualized budgets. Unexpected vehicle and equipment downtime is thus minimized.

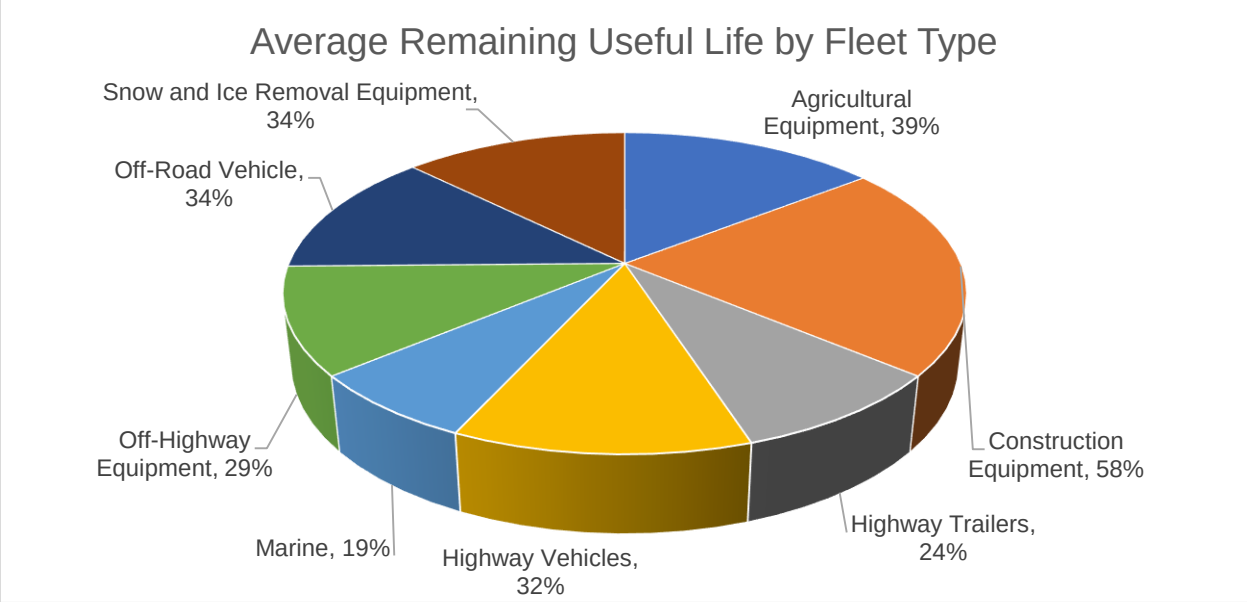


Figure 12.2 - Depicts the average remaining useful life by primary Fleet asset type (as of Q4, 2023).

Capital planning process requires the primary fleet categories in the above chart to be further categorized to apply OEM guidelines more easily, expected useful life, industry standards, preventative maintenance, annual inspections, and TRCA experience operating similar assets in comparable work environments were used to calculate the remaining useful life of the assets.

Consumption rate generally refers to the years of service of an asset compared to its projected service life**. With an average consumption rate of approximately 73 percent, TRCA's Fleet has reached or is near reaching the mid-point of service life.** Maintaining or even extending the average consumption rate will require adherence to regular preventative maintenance and inspections and periodic major maintenance activities to continue to provide the intended level of service through service life and or extend service life by preventing overall asset degradation.

In cases where fleet assets have surpassed expected useful life, a cost-benefit analysis is performed. An asset's condition is assessed for performance and reliability by existing maintenance records, wear and tear, and OEM specifications. A projected life expectancy beyond OEM specifications is identified, along with projected short-term maintenance costs. To try and maximize capital budgets, assets with extended service life may be transferred to projects or programs with less demanding requirements, provided the risk of full failure of the asset(s)is low. The condition or state of good repair is monitored closely to ensure these assets remain reliable while in active inventory. As risk profiles change and failure rates become more apparent, the state of good repair asset replacement is prioritized through annual capital budget planning.

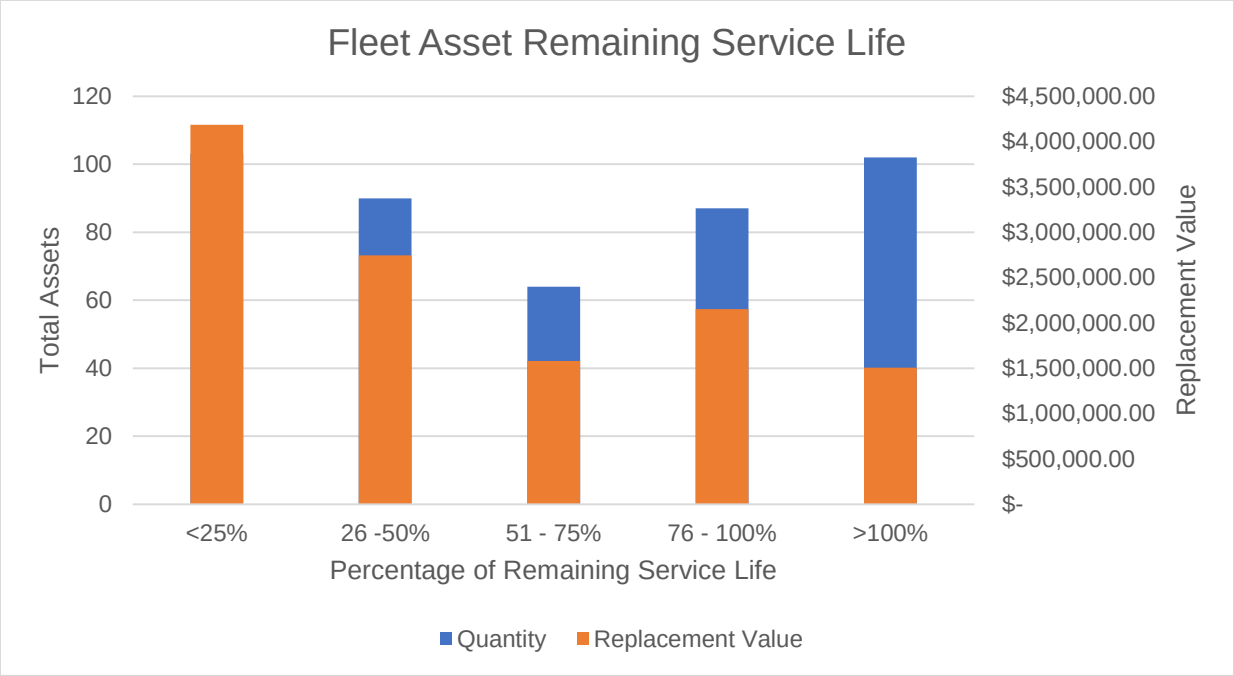


Figure 12.3 - Provides an overview of the quantity of fleet assets, remaining service life and replacement value (as of Q4, 2023).

In general, the quantity of assets which have remained in service beyond their projected service life has increased in recent years, however, this can be attributed to the delays and production lead times for various asset types as seen during the Covid-19 pandemic (2020 – 2022). Whereas some assets would have remained in service beyond expected service life upon receipt of the replacement asset with the intent of further supporting projects and programs with fleet resources while minimizing external costs related to additional vehicle rentals.

Further discussions with business units and analysis of risk occur to determine if the assets whose service life has been extended have a remaining serviceable life and value for the business units.

12.4 Asset Condition

Regular preventative maintenance on all fleet assets is conducted by third-party service providers. TRCA does not have the physical capacity or trained personnel to perform this work. Once the overall condition of each asset is evaluated by a trained professional, the results are compared to the Asset Condition Grade Summary chart below.

Note that the grade summary chart focuses on assessed asset condition and not necessarily on age of asset or OEM life expectancy alone. TRCA's approach to asset management is strategic in nature. Prior to deciding to dispose of an asset, staff, in consultation with third-party service providers (as required), use a four-pronged approach to evaluate asset usefulness and service-life extension:

- Condition assessment
- Project or program impact and relative intensity of work impact on asset
- OEM recommendations
- Employee experience using the same or similar assets

The byproduct of the evaluation informs service-life usefulness and probability of service life extension with an aim to maximize budgets.

Table 12.5 - Provides an overview and description of asset condition utilized in the AMP.

1	Very Good	The asset is generally in very good condition, typically new and or less than 25% expected useful life consumed. A few elements of the asset show general signs of deterioration that require attention
2	Good	The asset is generally in good condition ranging between 26-50% of useful life consumed. Some elements show general signs of deterioration that require attention. A few elements exhibit significant deficiencies.
3	Fair	The asset is generally in fair condition ranging between 51-75% of useful life consumed. The asset shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies.
4	Poor	The asset is generally in poor condition ranging between 76 - 100% of useful life consumed and near end of service life. Generally, many elements of the asset exhibit significant deterioration
5	Very Poor	The asset is generally in very poor condition and has exceeded useful life, showing widespread signs of advanced deterioration. Many components of the asset exhibit signs of imminent failure which can affect and or impair service, replacement parts are generally scarce, increasing risk of catastrophic failure.

In some cases, the percentage of remaining service life is not the most suitable condition indicator. In addition to the four elements above, service-life information should be augmented to include maintenance history, projected cost of preventative maintenance and major repairs during extended life. In a cost-benefit manner, these costs ought to be compared to the price of a new asset and life expectancy, along with expected reliability. These other factors could be incorporated in future updates to the asset management plan.

Shown in the following graph, approximately 38 percent of existing fleet assets are rated ‘Good’ or better. Conversely, approximately 44 percent of existing fleet assets are in ‘Poor’ or worse condition. This ratio suggests this will be a key business driver during budgetary processes as assets continue to age. Ensuring reliability and consistent performance requires a well-developed lifecycle plan in-place with judicious capital planning strategies.

Figure 12.4 – Overall fleet assets condition (as of Q4, 2023)

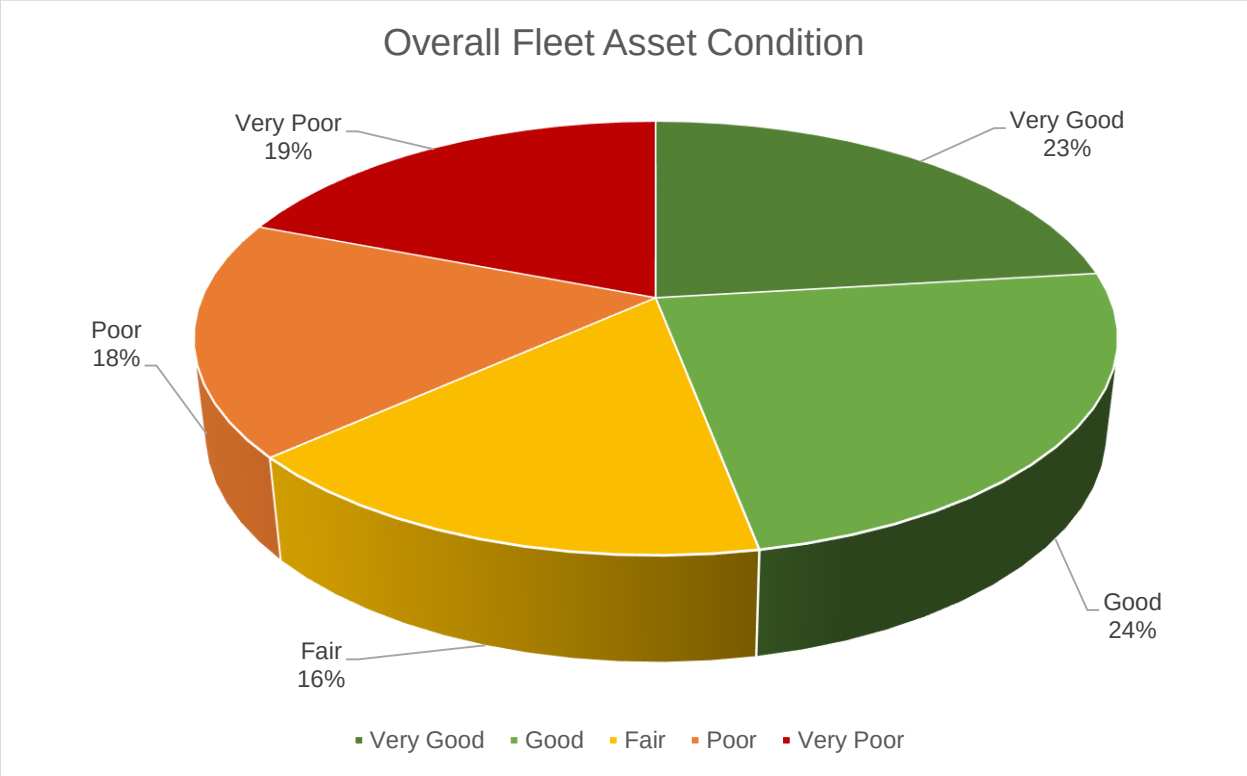


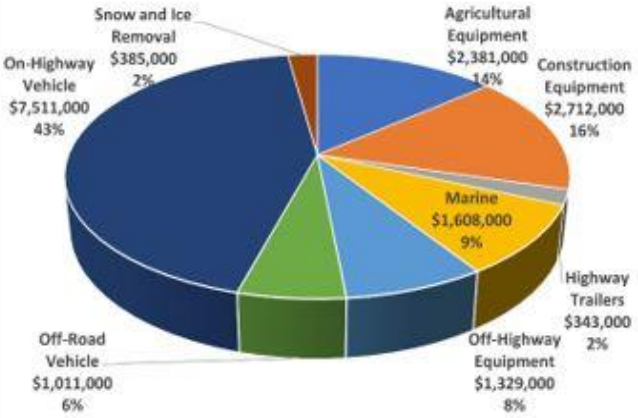
Table 12.6 - Provides an overview and description of asset condition utilized in the AMP

Service	Asset Condition	Inventory	Replacement Value
Fleet	Very Good	116	$4,815,000
	Good	120	$4,694,000
	Fair	83	$2,379,000
	Poor	88	$2,993,000
	Very Poor	96	$2,397,000
TOTAL		503	**$ 17,278,000**

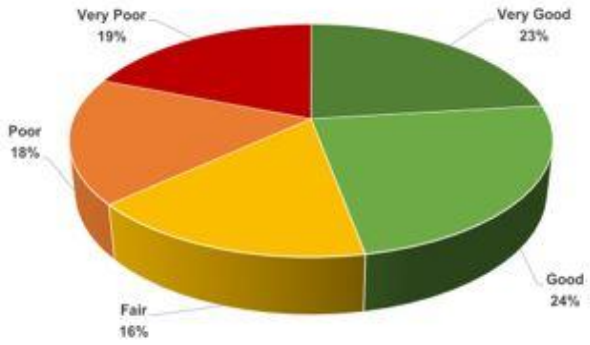
Total Asset Replacement Value:	**$17,278,000**
Current Condition:	Fair
Future Condition Trend (next 10 years):	Increasing
TRCA Strategic Plan:	Reduction or elimination of risk related to operations and improved operational efficiency.
Assets Included in this Category:	Agricultural, Off-highway, On-Highway Vehicle, Marine, Highway Trailers, Construction Equipment, Snow and Ice Removal, Off-Road Vehicle, Monitoring
Data Confidence and Reliability:	Condition Based Medium

The total replacement value of TRCA Fleet is **$17,278,000**. 47% of the assets are in Good to Very Good condition, and 14% are in Fair condition, with the remaining assets close to, or past, the end of Service Life. As the TRCAs Fleet assets having an overall average of Fair condition trending towards an averaged Good condition, these assets are meeting current needs but aging and may require attention in select asset types.

REPLACEMENT VALUE BY ASSET TYPES



CONDITION OF FLEET ASSETS



12.5 Level of Service (LOS)

Purpose

An objective of asset management planning is to ensure the performance and service provided by each asset meets the needs and expectations of end-users. Consistent levels of service also support the organization's strategic goals, corporate policies and procedures, legislative and regulatory requirements, and best practice standards. As noted, service levels are very much dependent upon capital budgets and TRCA's financial capacity to deliver the vehicles and equipment departments require.

12.5.1 Customer LOS

The Customer LOS defines the Divisional and or Project and Program requirements and the services that Corporate Fleet provide for the individual business units within the Projects and Programs through the assigned fleet resources tailored to their needs to meet operational requirements.

As the very objective of the Corporate Fleet is to provide safe, efficient, reliable, and effective fleet resources, the customer LOS is primarily qualitative because it has a high impact on Divisional and or Project and Program operations. Additionally, through the use and operation of fleet resources by business units, Corporate Fleet resources actively represent TRCA through operations pertaining to the business units and can have a direct impact on the perception of TRCA from all levels of customers, internally and externally.

The Customer LOS of Corporate Fleet as seen below, is somewhat challenging to quantify, due to the external factor requiring review of feedback including complaints and or inquiries related to fleet being received by TRCA. Whereas the Customer LOS pertaining to internal customers being the business units who rely on Fleet resources is relatively straightforward and relies on feedback from direct supervisors and review of historical operations of the asset. The economic impact or benefit is relatively broad in that select assets are directly related to fee for service projects and programs, and or have an impact on the service offerings available to guests at Conservation Parks or Educational Field Centers.

Table 12.7 – Customer LOS

Value	Objective	Measure	Performance	Target
Safe	Providing safe fleet resources for projects and programs	Percent (%) of legislated inspections met.	100%	
Effective	Providing vehicles and equipment at the appropriate quality	Percent (%) of fleet assets that meet the quality requirements for end users	>95%	
		Percent (%) of new vehicles which meet or exceed end user expectations	>95%	
Reliable	Providing reliable vehicles and equipment	Percent (%) of fleet assets that meet and or exceed the expected Serviceable Life	>95%	

Value	Objective	Measure	Performance	Target
	resources for end users.	Percent (%) of fleet assets that meet the expectations of the user groups.	>95%	⇧
		Percent (%) of time the appropriate number of vehicles are ready for use by a service group (i.e., uptime)	>85%	⇧
Efficient	Providing vehicles and equipment which have minimal Greenhouse Gas (GHG) emissions.	Annual Greenhouse Gas (GHG) emission (Tonnes)	829	⇩

12.5.2 Technical LOS

The Technical LOS as seen below, defines the technical standards, regulatory requirements and or industry guidelines required for select fleet resource types/categories to meet minimum requirements for operation on a regular basis. Additionally, Technical LOS includes quantitative and qualitative measures of fleet performance metrics, related to the operation of fleet resources. In alignment with the Corporate LOS, the Technical LOS includes measures related to Environmental Stewardship such as the efforts undertaken to decarbonize TRCA's Fleet resources.

Table 12.8 – Technical LOS

Value	Objective	Measure	Performance	Target
Safe	Providing safe fleet resources for projects and programs	Percent (%) of legislated inspections met	100%	100%
Effective	Providing vehicles and equipment at the appropriate quality	Percent (%) of fleet assets that meet the quality requirements for end users.	>95%	⇧
		Percent (%) of new vehicles which meet or exceed end user expectations	>95%	⇧
		Number of complaints related to appearance of vehicles (i.e., cleanliness, and or condition)	10	⇩
		Number of external complaints regarding fleet operations	5	⇩

Value	Objective	Measure	Performance	Target
Reliable	Providing vehicles and equipment at the appropriate quality.	Percent (%) of vehicles and equipment in operation beyond their optimum service life.	22.4[2]	⇑
		Percent (%) of regular preventive maintenance activities completed on time.	>85%	⇑
		Percent (%) of time the appropriate number of vehicles are ready for use by a service group (i.e., uptime)	>85%	⇔
Efficient	Providing fleet services in an efficient manner	Operating budget of Corporate Fleet	$1.5M	⇔
		On-Highway Vehicle Operating Cost per Kilometer ($/km)	$ 0.89	⇔
		Reinvestment Rate -Annual average of projected 10-year fleet asset renewal budget as a % of current replacement value	9.2%	⇔

⇑ **Positive Upward** ⇓ **Positive Downward** ⇔ **No Change**

TRCA utilizes a technical LOS for prioritizing the regular inspection and maintenance requirements of Fleet resources to ensure safe operation. There are numerous legislative and/ or regulatory requirements which provide guidelines minimum requirements for select categories of fleet, for the operation, and maintenance, Fleet Resources.

Resources related to the safe operation of Fleet within TRCA include:

On-Highway Vehicles and Trailers:

- Ontario Highway Traffic Act
- Commercial Motor Vehicle Inspections

Off-Highway Equipment:

- O. Reg. 213/91 Construction Projects; Occupational Health and Safety Act

Off-Road Vehicles:

- Off-Road Vehicles Act
- Motorized Snow Vehicles Act
- Safety Helmets

[2] Approximately 50% are non-powered equipment and pose low risk of failure, whereas the balance is in various stages of lifecycle replacement

Marine Vessels:

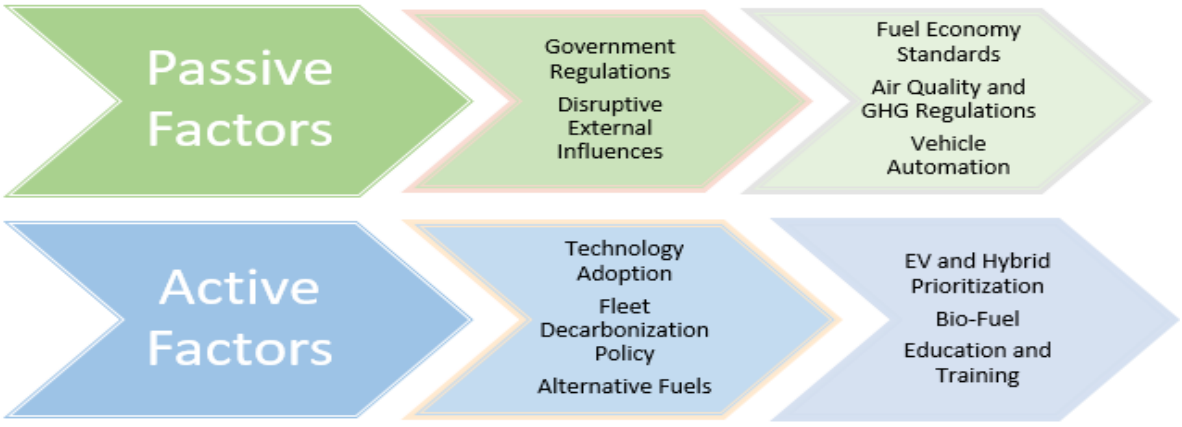
- Transport Canada, Small Commercial Vessel Safety Guide
- Transport Canada, Canada Shipping Act
- Transport Canada, Small Vessel Register (Commercial Vessel)
- Transport Canada, Small Vessel Compliance Program

In collaboration with TRCA business units who rely on Fleet resources, projects and programs communicate quantitative service requirements and qualitative needs and desires. Similarly, each business unit must develop and present a viable business case for ongoing year-over-year vehicle and equipment service increases. These requests are evaluated on a priority basis against various other internal capital project submissions and may or may not be approved.

While participation in the Transport Canada (TC) Small Vessel Compliance Program (SVCP) is voluntary, TRCA ensures all vessels, equipment and machinery meets necessary guidelines and regulations. In addition to the above, TRCA conforms to SVCP guidelines by ensuring safe work and operational practices are in place for all vessel crews and passengers. Maintaining consistent service levels requires a state of good repair but also operating practices that do not place unnecessary and undue stress on assets.

Utilizing a best practice approach, standardized through policies and procedures, TRCA actively manages service levels by promoting documentation of pre and post trip defects and operational abnormalities for corrective action that is consistent with OEM recommendations and specifications.

Two other factors form trends potentially impacting fleet's ability to deliver consistent service levels. While each of the passive and active factors identified in the chart below impact service delivery in varying degrees over the short and medium term, it is essential to monitor and adjust fleet business practices to minimize vehicle or equipment downtime. Monitoring developments in these areas is essential to ensuring projects and programs have access to vehicles and equipment they require to meet their service delivery requirements.



Passive governmental factors that influence TRCA fleet operations potentially stem from both federal and provincial levels of governments. Regulations affecting fuel standards and air quality, for instance, tend to have long-term implementation plans that have nominal short-term financial impact to fleet operations. While some of these factors in the medium to long-term will help TRCA to procure a more sustainable fleet, most of the costs associated with regulatory changes are indirectly absorbed by the divisions that operate project and programs through suggested retail prices.

Regulatory developments in the passive category therefore represent a business-as-usual scenario. Retail price increases, emission standards changes and automation advances, as they occur, are accommodated through short and medium-term capital budget planning process much like the adoption of hybrid or electric vehicles in the past.

Active factors present a proximate adoption scenario because immediate action is required. Although, as noted above, TRCA has well-established fleet business practices that facilitate the adoption of highly efficient vehicles, including hybrid, plug-in hybrid, and electric vehicle technology adoption. Active factor implementation requires research, analysis, internal stakeholder collaboration, and eventual business case development with probable capital budget implications. Furthermore, with the development of TRCA's Fleet Decarbonization Policy, replacement of existing on-highway vehicles specifically that of Light-Duty Trucks and Passenger Vehicles will prioritize Zero Emission Vehicles (ZEV), generally in the form of Battery Electric Vehicles (BEV) technology. Considerations are to be made due to the constraints of specific business units where electrification would be highly restrictive to their operations. Whereas decarbonization efforts for Equipment, and Medium and Heavy-Duty Trucks will occur over time as technology becomes available and where budget exists, in the short-term adoption of blended biodiesel will assist in the decarbonization of TRCA's Equipment fleet.

Achieving economic, environmental, and social benefits requires significant internal stakeholder collaboration, compared to the business-as-usual passive factor scenario. In addition, the above active factor implementation often requires development of new policies and procedures that govern, for instance, modified operation and OEM maintenance requirements. Working with internal peer review teams to complete these items in a timely manner ensures employees operate novel equipment safely and that lifecycle asset usability is maximized.

12.6 Asset Management Strategy

PAM provides fleet management services covering the Administration (asset management, analytics, budget), Fleet Planning (procurement and remarketing), Fleet Maintenance (service and repairs). As part of PAM's fleet asset management strategy, a comprenhensive condition assessment and lifecycle renewal program has been developed for all corporate vehicles and equipment. This straegy is based on a combination of historical operations and condition assessments.

12.7 Existing Operations and Maintenance Activities

Vehicle and equipment maintenance activities are an integral component in the lifecycle planning process. The following major maintenance activities are examples of regularly scheduled activities managed and directed by fleet administrators. A stringent preventative maintenance program is followed as per OEM guidelines to ensure preventative maintenance and repairs are completed in a timely manner.

The following are the major maintenance activities TRCA performs:

- Daily safety inspections are conducted by staff and in compliance with TRCA policy and procedures.
- Periodic major component overhaul, repair and rebuilding structural asset pieces per OEM specifications.
- All safety related equipment, for example brakes, is inspected at minimum annually. Other maintenance items are inspected and replaced or repaired as necessary in accordance with OEM service schedules and/or accelerated or irregular wear.

End of service life fleet assets are disposed of through public auction, once replacement assets are onboarded. Fleet assets are maximized to the extent possible during the disposal process through appropriate timing and or bundling of equipment. Revenues generated through the disposal process are deposited into fleet reserve fund.

12.8 Procurement Methodologies and Future Demand

Staff strategieze asset managmenet replacement via a projected 10-year capital budget with annualized budget maps, which guide procurement and disposition. The process, combined with the four guiding principles, and preventative maintenance program structure listed above, provide sufficient time to reevaluate purchases while simultaneously ensuring existing service levels are maintained. This well-estabilshed process works efficiently beause it is executed in coordinated effort with all TRCA divisional needs and the existing purchasing policy and procurement guidebook.

12.9 Financing Strategy

The financial strategy was developed alongside the asset management plan to effectively manage and sustain fleet operations over the course of the plan. Long-term financial planning ensures vehicles and equipment are managed in a fiscally responsible and sustainable manner. A key objective is to predictably ensure long-term costs are both manageable and that projections are accurate.

This section provides a summary of financial projections over the following 13 years, ending in 2034. The data is based on the current state of fleet inventory and remaining service life. Projections focus on optimal service life by factoring reliability, efficiency, and the following costs into the equations:

- Recoveries/Revenues
- Operating Expenditures
- Capital Expenditures
- Reserve Fund Balance (end of year)

Projections were calculated using a modest 0.25 percent annual increase over 14-years whereas operating expenditures were calculated using a 0.5 percent increase per annum.

With exception of capital costs required for fleet replacement in 2024-2025 which utilized current market costing and inflation, capital expenditures forecasts utilized historical asset costs with a 3.0 percent annual inflation rate. As in Asset Valuation above, these costs do not consider changes in asset type requirements due to project or program growth and or conversion to alternative fuels. However, practical considerations are evaluated to account for aftermarket equipment upfitting when necessary.

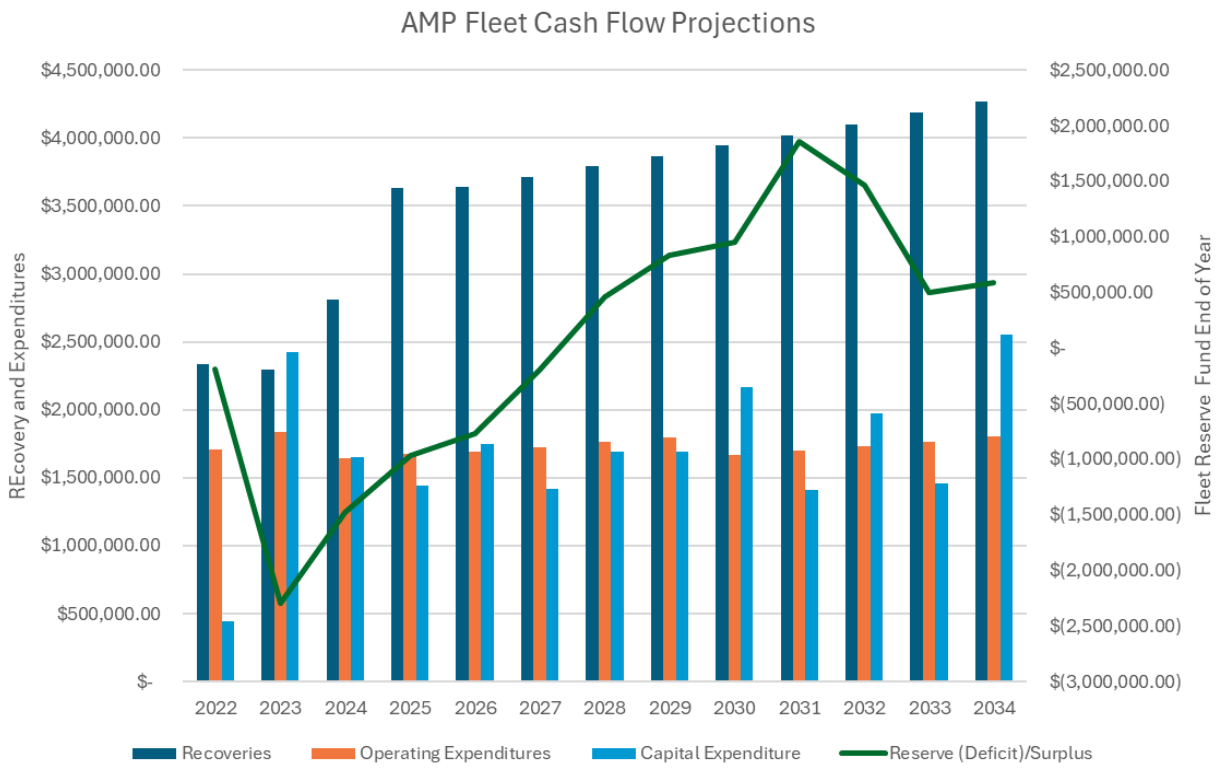


Figure 12.5 - Fleet Cash Flow Projections

The above graph projects capital expenditures (new fleet acquisitions), operating expenditures (fuel, maintenance, licensing, etc.), recoveries and projected fleet reserves during the period ending 2034. Most noteable is the continued growth of the reserve fund. The year 2023 reserve fund is approximately $1.6 million in deficit as a direct result of fleet order carry forward due to manufacturing supply chain and delivery challenges seen during the Covid-19 pandemic. Improvements in supply chain along with the recalculations to the intra-departmental fleet recovery rates is expected to assist in the return to a reserve surplus by 2026, at the earliest.

An active management strategy that will reduce risk of return to reserve deficits is recalculation of internal vehicle and equipment cost recoveries for some or all fleet asset categories. Historically, fleet recovery rates were static and not adjusted over time to account for inflation as it relates to purchase prices, fuel costs and maintenance and repairs. If deemed necessary, recalculation of usage rates for some or all fleet asset types can be completed to ensure sufficient reserve balance.

Maintaining a positive reserve balance provides PAM staff the flexibility and capacity to support projects and programs new assets when and where required due to new project and program requirements, pending business case approvals and or repalcement of an asset where full failure of an existing asset is observed.

Additionally, TRCA currently owns and operates four dual wand electric vehicle charging stations. While the revenue stream from electric vehicle chargers is currently relatively small, it is expected this revenue stream will increase over time as electric vehicle adoption increases. By 2024, TRCA estimates that between 15-20 electric vehicle charging stations will be active within TRCA and accessible at TRCA administrative offices for all electric vehicle drivers (public, staff, and fleet). These revenues, which

contribute to the fleet reserve are generated through user fees applied on a time used basis, and revenues are likely to increase in line with the proportion of electric vehicles in operation.

12.10 Environmental Stewardship

While environmental stewardship practices have been an informal part of asset management historically, through the procurement hybrid electric vehicles and the irregular procurement of battery electric vehicles. TRCA has historically tracked fuel consumption and the corresponding Greenhouse Gas (GHG) emissions generated through the operation of TRCA fleet.

Table 12.9 – Environmental Stewardship – Performance Matrix

Value	Objective	Measure	Performance	Target
Environmental Stewardship	Providing vehicles and equipment which have minimal greenhouse gas emissions	Annual Greenhouse Gas (GHG) emissions (tonnes)	829	
		Annual fuel consumption all On-highway vehicles (L/100kms)	16.45	
		Total fuel consumption Light Duty (LD) Vehicles per year (L/100kms)	13.2	
		Total fuel consumption Medium Duty (MD) Vehicles per year (L/100kms)	24.2	
		Total fuel consumption Heavy Duty (HD) Vehicles per year (L/100kms)	34.2	
	Fleet Decarbonization	Total number of Battery Electric Vehicles (BEV)	2	
		Total number of Hybrid Electric Vehicles (HEV)	30	
		Total number of Plug-In Hybrid Electric Vehicles (PHEV)	2	
		Total volume of blended biodiesel used in Fleet Equipment (Liters)	8000	
		Number of Fleet Equipment with Alternative Fuel Systems i.e., Propane, BEV, HEV, PHEV etc.	26	

 **Positive Upward**  **Positive Downward**  **No Change**

With the observation of an increase in passive factors related to regulatory requirements for a transition to Zero Emisison Vehicles (ZEV) and an increase in available ZEVs from automanufacturers in configurations which are similar to that required by TRCA currently available or scheduled for release in 3-5 years, staff have planned steps to actively decarbonize TRCA's on-highway vehicle fleet. These planned actions include the prioritization of BEV at end of lifecycle of existing fleet assets and or new acquisition, and these actions may require additional Electric Vehicle Supply Equipment (EVSE).

Replacement cost estimates for the existing fleet do not account for work location specific infrastructure improvements. For instance, the adoption of ZEV technologies i.e., Battery Electric Vehicles (BEV) or Plug-In Hybrid Electric Vehicle (PHEV) typically requires electrical infrastructure upgrades and Electric Vehicle Supply Equipment (EVSE), otherwise known as vehicle chargers to be installed to facilitate recharging. These infrastructure costs are distinct from EV vehicle purchase price and are critical equipment to ensure optimal usage and up-time and minimizing disruption to projects and programs. Ensuring adequate type and supply of EVSE at TRCA administrative and field offices will further assist in mitigating range anxiety among drivers and ensure optimal utilization of ZEV fleet. Additional capital budget considerations and planning occur when fleet at end of lifecycle are identified for ZEV adoption during replacement. Mid-to-long-term capital and strategic planning is necessary to ensure installations of EVSE occur as and when required during lifecycle of existing Fleet to align with Fleet Decarbonization efforts and strategies.

The decarbonization of TRCA's off-highway, agricultural, construction and marine fleet will be managed on a case-by-case basis currently due to the limited market technology available for ZEV and or alternative fuel systems for these fleet types at this time. It is plausible that increased ZEV or alternative fuel system technologies will be more present in these manufacturing sectors in the next five (5) years. While appetite for the adoption of these technologies is present within select business units, the limited technology and or available supplier inventory has been a challenge for those who desire to transition to ZEV and alternative fuel systems. Staff have identified areas of TRCA fleet which would be ideally suited to ZEV or alternative fuels and would facilitate a straightforward adoption of these technologies. It is foreseen the transition of ZEV and alternative fuel technologies in these fleet types can have a positive improvement in customer or guest experience at TRCA facilities, as well act as an example to industry peers and or customers and guests of TRCA that adoption of ZEV and alternative fuel technologies is feasible and has minimal impact to operations.

To assist in the decarbonization of off-highway, agricultural, construction and our marine fleet in the interim, staff have determined that an increase in usage of blended biodiesel for these fleet types is a suitable solution for decarbonization. The adoption of blended biodiesel will have minimal impact on the operations of TRCA's projects and programs due to current inventory of fuel storage at TRCA facilities. The initial phase of adoption of blended biodiesel primarily includes B20 blended biofuel, as upper tier manufacturers conducted sufficient testing of B20 fuel blend to determine impacts to performance and efficiency and suitable for warranty coverage. It is anticipated the blend ratio of biogenic to petroleum i.e., B20 biodiesel which contains 20% biogenic fuel base to 80% petroleum fuel base can be adjusted overtime due to powertrain compatibility and or seasonally as required for colder climate operations.

Section 13:

PLAN IMPROVEMENT AND MONITORING

SECTION 13: PLAN IMPROVEMENT AND MONITORING

13.1 Plan Review

This Asset Management Plan is intended to be a living document that is relevant and integral to TRCA's daily asset management activities. For the plan to remain useful and relevant, the following process of Asset Management Plan monitoring, and review activities will be undertaken:

- Formally adopt the plan.
- Review and formally adopt levels of service, as these become available.
- Revise the AMP every 5 years to incorporate and document changes to work programs, outcomes of service level reviews, and new knowledge resulting from the asset management improvement program. Some sections, such as Section 3.0 – State of the Infrastructure or Section 4.0 – Levels of Service, may require updating more frequently.
- Complete quality assurance audits of asset management information to confirm the integrity and cost-effectiveness of data collected (ongoing).

13.2 Plan Monitoring

In addition to benchmarking with comparable departments of other municipalities and/or Conservation Authorities, the following indicators can be monitored to measure the effectiveness of this AMP:

- Compliance with legislative requirements
- Quality of Service Delivery and compliance with service targets or targets exceeded
- Capital project delivery outputs delivered to schedule (or better) and on budget (or better)
- Operational and maintenance budgets met (or better)
- Quality of Risk Management—No events occurring outside the risk profile

13.3 Plan Improvement

Broader consideration should be given in areas such as:

- **Updated asset condition and lifecycle replacement studies**. It will be important to ensure alignment with the information requirements from the updated legislation and the forecasting outputs that will allow for less reliance for major asset categories.
- **Technology** – opportunity to leverage existing and emerging technological solutions for the purpose of planning, monitoring, and reporting on assets, as well as to pursue lifecycle cost savings and deferral opportunities in the delivery of services and rehabilitation of infrastructure.

  Once such initiative is the Enterprise asset management software (EAM) that TRCA acquired, the EAM includes the Maintenance Management System application that connects with the inventory management system and capital planning. Maintenance manager and Asset Manager Modules are used to maintain and report on TRCA facilities and infrastructure. These modules integrate with TRCA existing GIS ESRI Arc system.

- **Service level measurement** – refine and update service level measures, as well as develop KPI dashboards in order to incorporate the resulting information into TRCA's strategic decision-making processes.
- **Service Delivery** – continue to investigate opportunities to maximize efficiency, create value, manage risk, increase service level, and/or minimize overall cost (including infrastructure renewal cost) through service delivery models.
- **Growth-related infrastructure** – ensure any new framework provides for further integration of the planning for lifecycle costs of both existing and new growth-related infrastructure.
- **Resources** – the new planning and reporting requirements that are anticipated in the upcoming regulations will create an on-going demand that may need to be addressed through the allocation of new or re-purposed internal staff resources, and/or the allocation of additional funds for expanded third-party services.
- **Organizational alignment** – Standardize asset data-based capital project planning as well as routine O&M activities in order to better coordinate asset management processes across the organization.

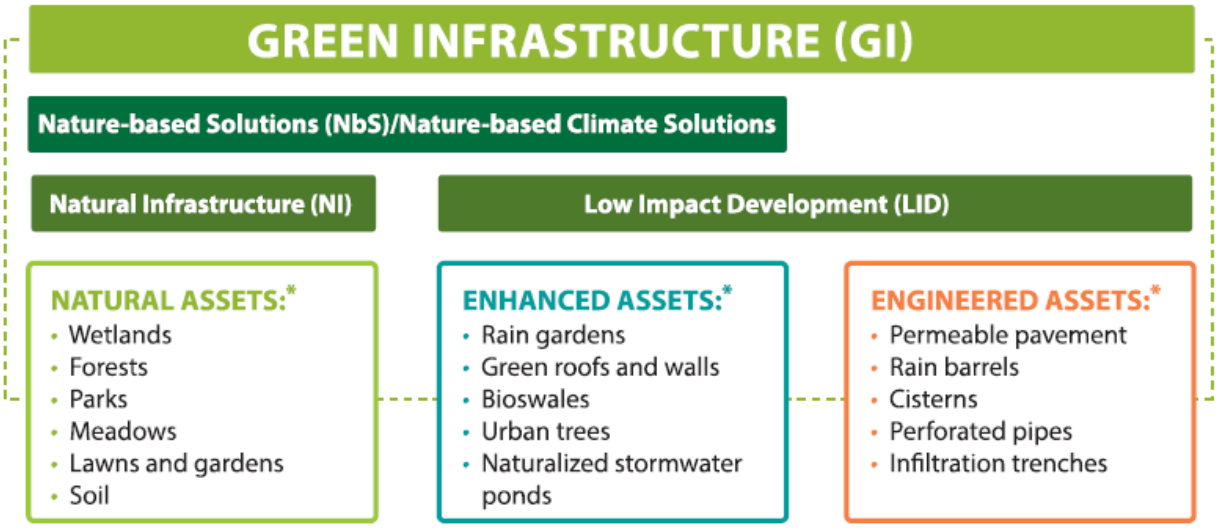
13.4 Next Steps – Integrate Green Infrastructure into TRCA's AMP

Green infrastructure supports the delivery of important Conservation Authority services through functions such as stormwater management, heat reduction, recreation, habitat provision, and pollination. By incorporating Green Infrastructure assets into asset management processes, organizations can help decrease capital, operations, and maintenance costs, maintain the delivery of important services, and enhance their ability to adapt to climate change, all while protecting or enhancing other environmental, economic, and social benefits that nature brings to communities. Many of our municipal partners are integrating Green Infrastructure into their AMPs in accordance with O. Reg. 588/17, therefore it is not only important for TRCA to align with these efforts but to lead by example.

Integration of Green Infrastructure in future AMPs is intended to help meet the following business objectives:

- Develop a state of infrastructure report for TRCA's green infrastructure assets that will create a foundational benchmark to understand the condition of our green infrastructure and the services it provides.
- Support TRCA in managing green infrastructure assets over their lifecycle to achieve desired levels of service.
- Directly support high quality facilities, user experiences and mitigated risks through effective asset management and a reduced state of good repair and improve understanding of current and future state of TRCA's watersheds and ecosystems and identify actions needed to achieve watershed health.
- Align TRCA's asset management with O. Reg. 588/17 with respect to the identification, condition rating and evaluation of levels of service of green infrastructure assets, focused on those that are owned and managed by TRCA.

For the purposes of this project, green infrastructure is defined as natural and human-made elements that provide ecological and hydrological functions and processes. Green infrastructure can be subdivided into three main categories: natural assets, enhanced assets, and engineered assets.



Because green infrastructure is a core component of TRCA's business, the integration project will involve significant coordination and collaboration between different TRCA divisions.

Some initial actions include consultation with various divisions to:

- Identify related TRCA strategies and management plans to ensure alignment and minimize overlap (e.g. Forest Management Plan).
- Meet with green infrastructure asset managers to introduce the process and benefits of asset management and decide on objectives for including specific green infrastructure assets in the process.

13.5 Next Steps – Integrate Information Technology Assets into TRCA's AMP

TRCA Divisions utilize a broad range of technological resources to deliver programs and services. These include corporately managed IT assets, as well as divisionally managed technologies that are directly incorporated into operational systems and assets such as flood management and monitoring systems, building security and management, and field monitoring and data collection services. IT assets encompass a broad range of technologies, but can be grouped into four major categories:

- **End User devices** – Laptops, Tablets and mobile devices; Field Data Collection devices; Surveillance equipment
- **Infrastructure** – Data Centre and Networking Equipment; Monitoring Equipment; Building Automation Control systems
- **Software** – Licensed software (perpetual contract); Developed software and database systems
- **Data Assets** – Acquired or developed data sets to support future decision-making and information products

The technology environment has seen a shift toward a subscription-based or technology-as-a-Service model, which is continuing to put pressure on operational budgets and away from capital investments for technologies.

Integration of IT Assets in future AMPs is intended to help meet the following business objectives:

- Develop a state of infrastructure report for TRCA's technology assets that will create a benchmark for lifecycle planning for the maintenance and replacement of technology solutions to support corporate and divisional services
- Better understand the service level requirements for technology used across TRCA business operations and to plan for future capacity needs
- Directly support TRCA Playbook term impacts: (4.2) asset management and state of good repair of technology assets, and supporting an agile and flexible organization

The shared responsibilities for IT asset management will require significant coordination and collaboration between different TRCA divisions.

Some initial actions include consultation with various divisions to:

- Develop ITAM policies to guide IT asset management plans for corporate and divisionally managed technologies.
- Develop service levels and capacity management targets to support different business operational requirements.
- Develop a financial plan for ongoing maintenance, upgrades and replacement of IT assets.

www.trca.ca

Toronto and Region Conservation Authority

2024 Asset Management Plan

Presented by: Rutvik Pandya
Senior Manager, Asset Management Planning and Performance

November 22, 2024

Asset Management at the TRCA

- **Asset Management Policy:**
  - Approved on November 17, 2017, under Resolution # A202/17.
  - Established the organization wide asset management framework.
  - Goal setting for management of assets with material impact to TRCA's finances.

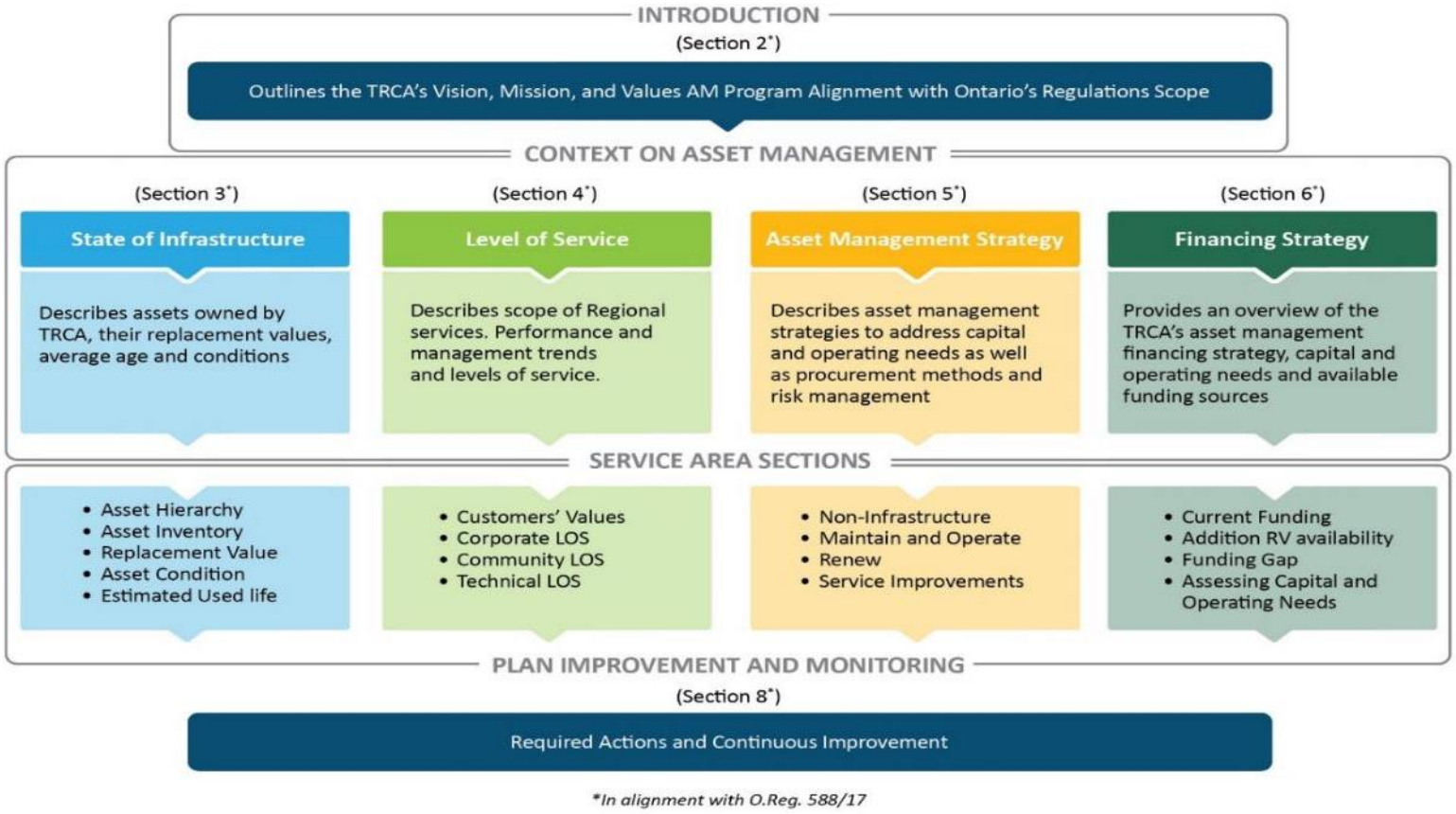
- **Asset Management Strategy:**
  - Aimed at supporting the delivery of the Asset Management Policy.
  - Methods to facilitate life cycle asset management practices across the organization.

Asset Management Plan

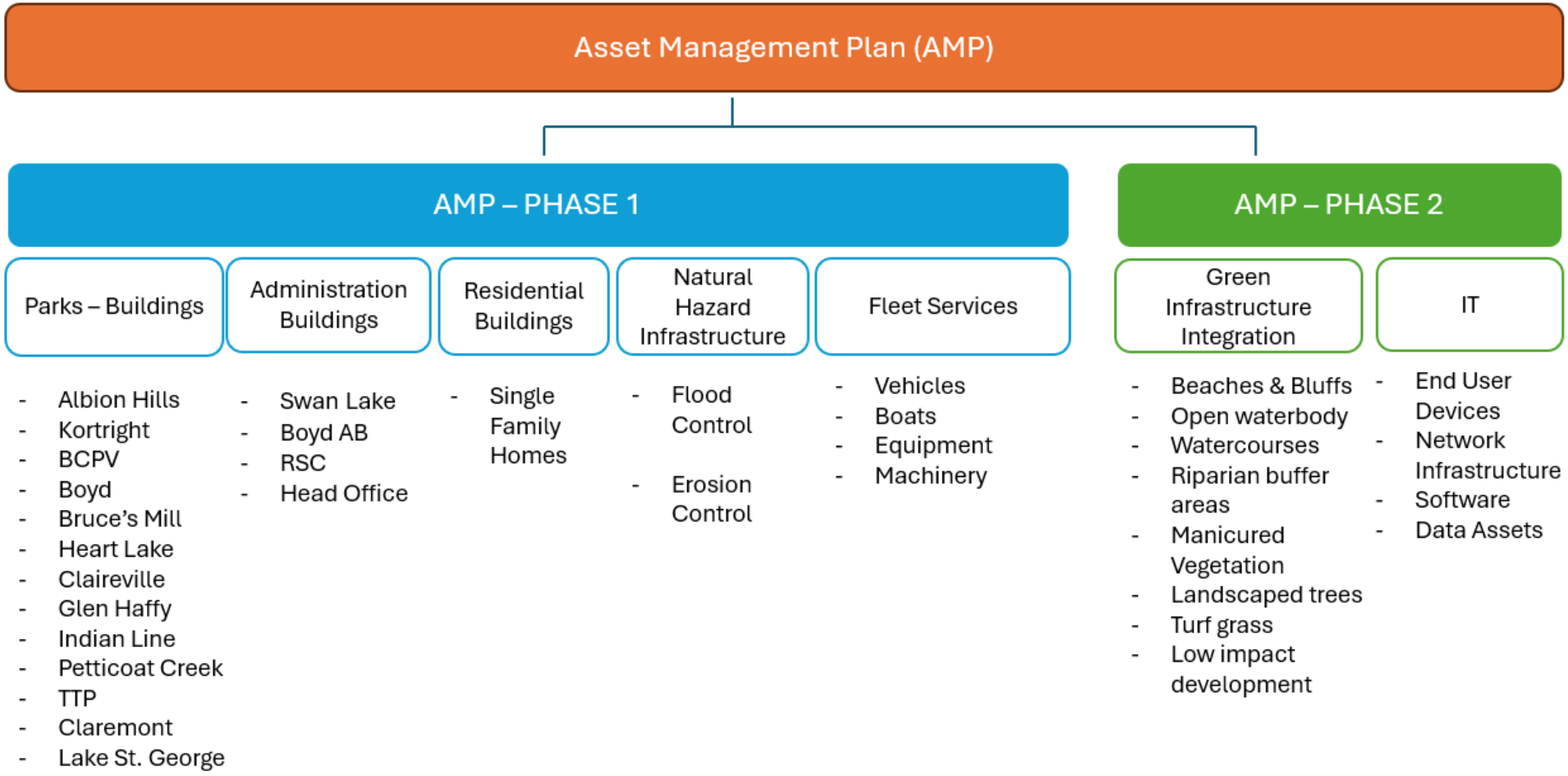
Overview

- TRCA's first Asset Management Plan:
  - Outlines consistent framework to Asset Management practices.
  - Incorporates assets from four (4) core Service Areas:
    - Flood Control Infrastructure
    - Erosion Control Infrastructure
    - Buildings (Administrative, Residential and Parks facilities)
    - Fleet Services
  - Meets requirements of O.Reg 588/17, and O. Reg 686/21.

Structure


INTRODUCTION
(Section 2*)
Outlines the TRCA's Vision, Mission, and Values AM Program Alignment with Ontario's Regulations Scope
CONTEXT ON ASSET MANAGEMENT
(Section 3*)
State of Infrastructure
Describes assets owned by TRCA, their replacement values, average age and conditions
(Section 4*)
Level of Service
Describes scope of Regional services. Performance and management trends and levels of service.
(Section 5*)
Asset Management Strategy
Describes asset management strategies to address capital and operating needs as well as procurement methods and risk management
(Section 6*)
Financing Strategy
Provides an overview of the TRCA's asset management financing strategy, capital and operating needs and available funding sources
SERVICE AREA SECTIONS
• Asset Hierarchy
• Asset Inventory
• Replacement Value
• Asset Condition
• Estimated Used life
• Customers' Values
• Corporate LOS
• Community LOS
• Technical LOS
• Non-Infrastructure
• Maintain and Operate
• Renew
• Service Improvements
• Current Funding
• Addition RV availability
• Funding Gap
• Assessing Capital and Operating Needs
PLAN IMPROVEMENT AND MONITORING
(Section 8*)
Required Actions and Continuous Improvement
*In alignment with O.Reg. 588/17

Service Areas



Infrastructure Rating Scale

1	Very Good	The infrastructure in the system is in generally good condition, typically new or recently rehabilitated. A few elements show signs of deterioration that require attention.
2	Good	The infrastructure in the system is in good condition; some elements show signs of deterioration that require attention. A few elements show sign of significant deficiencies
3	Fair	The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies.
4	Poor	The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
5	Very Poor	The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service.

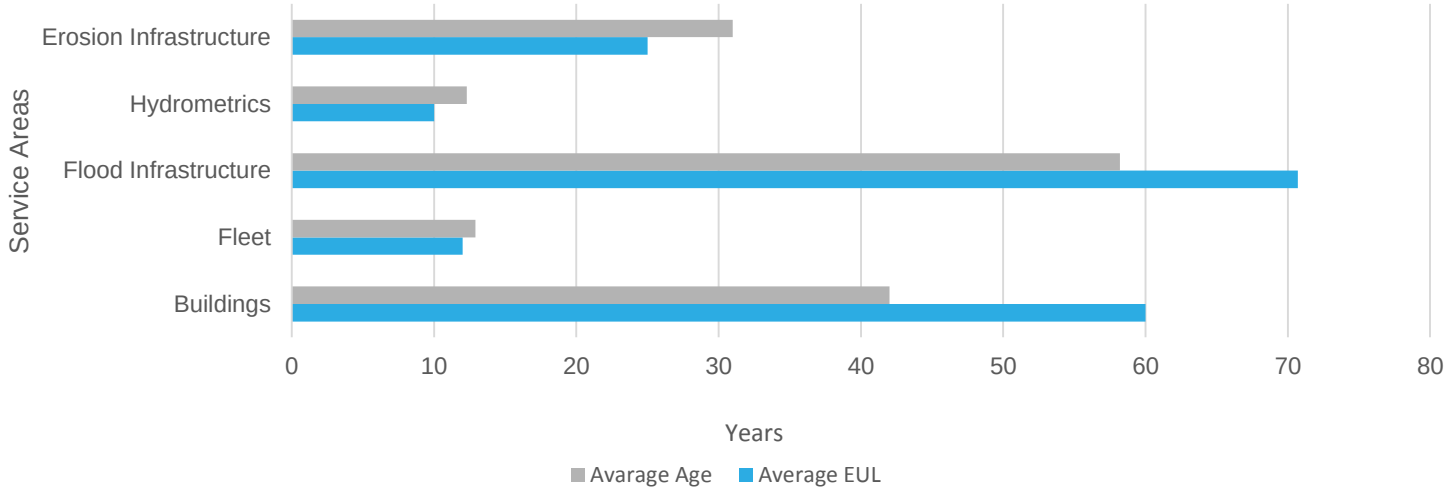
Key Figures

Item	Value (2023)
Replacement Cost	$788.66 Million
Annual Capital Requirement	$23.40 Million
Annual Capital Available	$14.60 Million
Condition of Assets	Fair

- Flood Control and Erosion Control assets make up:
  - 73% of the Replacement Costs.
  - 75% of the Annual Capital Requirement.
  - 82% of the Annual Capital Available.

- Approximately 10% of the in-scope assets, primarily attributed to the Residential Assets, are rated **Poor to Very Poor** with an estimated replacement value of **$80.37 Million.**

Average Age and Expected Useful Life



- Older infrastructure systems like Flood and Erosion control require robust asset management planning due to their impacts on public health and safety.
- Buildings assets, especially residential structures, also require routine injection of capital to maintain habitability.

Service Area Highlights

Flood Control Infrastructure

Item	Detail
Asset Inventory	12 dams of which 5 provide flood protection. 17 flood control structures that include channels, dikes, and flood walls.
Replacement Cost (2023)	$197.75 Million
Current Condition	Good to Fair
Annual Capital Required	$3.4 Million
Annual Capital Available	$0.5 Million

- Asset Management Plan is informed by routine inspections and studies.
- TRCA has compiled a list of deficiencies and their expected repair costs to prioritize repairs and to take advantage of potential funding opportunities.

Erosion Control Infrastructure

Item	Detail
Asset Inventory	- Valley and River Erosion Control Systems (253) - Waterfront Erosion Control Systems (29)
Replacement Cost (2023)	$376.47 Million
Current Condition	Good to Fair
Annual Capital Required	$14.3 Million
Annual Capital Available	$11.4 Million

- Significantly funded by the City of Toronto – 69% of assets located here.
- Keep 65% of TRCA's erosion control assets in 'Acceptable' condition to support the corporate LOS. Currently, approximately 89% of the erosion control systems are in 'acceptable' condition.
- Focus on more frequent maintenance through minor repair works.

Buildings – Administrative Facilities

Item	Detail
Asset Inventory	The New TRCA Head Office, Boyd Centre, Restoration Services Centre, Dave Barrow Centre for Conservation, Eastville
Replacement Cost (2023)	$87.64 Million
Current Condition	Very Good to Good
Annual Capital Required	$0.4 Million
Annual Capital Available	$0.5 Million

- The new TRCA Head Office will set a benchmark for sustainable design in commercial buildings.
- Current Levels of Service comply with Legislation (OBC, OFC, AODA, OHSA).
- Outside of the legislated requirements, most lifecycle activities are Building Condition Assessment (BCA) driven with a focus on health and safety over cosmetic upgrades.

Buildings – Residential Assets

Item	Detail
Asset Inventory	50 Residential houses across TRCA's jurisdiction
Replacement Cost (2023)	$33.36 Million
Current Condition	Fair to Poor
Annual Capital Required	$0.9 Million
Annual Capital Available	$0.2 Million

- Current Levels of Service comply with Legislation (OBC, OFC, RTA, O.Reg. 517/06).
- Asset Management Strategy is based on maintaining current service levels, as such Asset Management Plans are informed primarily through a combination of BCAs as well as routine inspections by TRCA staff. Ad-hoc projects are undertaken based on any emergent tenant concerns.
- Due to funding limitations, lifecycle activities are planned with a focus on health and safety over cosmetic upgrades.

Buildings – Parks Facilities

Item	Detail
Asset Inventory	173 Structures with varying degree of public access located throughout the 13 TRCA Conservation Parks, and Camps.
Replacement Cost (2023)	$76.18 Million
Current Condition	Good
Annual Capital Required	$4.4 Million
Annual Capital Available	$2.0 Million

- $11.7 Million deferred maintenance backlog.
- Asset Management Strategy is based on maintaining current service levels, as such Asset Management Plans are informed primarily through a combination of BCAs as well as any emergent concerns from public or parks staff.
- Due to funding limitations, lifecycle activities are planned with a focus on health and safety over cosmetic upgrades.

Fleet Services

Item	Detail
Asset Inventory	503 Assets divided into nine (9) primary categories.
Replacement Cost (2023)	$17.28 Million
Current Condition	Good
Annual Capital Required	N/A
Annual Capital Available	N/A

- Annual capital acquisition costs and operational expenses are offset via interdepartmental recoveries. Surpluses are deposited into the fleet reserve fund to replenish any deficits due to unanticipated/ unplanned capital acquisitions.
- External supply chain pressures have a large impact on fleet operations.
- Ongoing focus on environmental stewardship through greening of fleet assets where possible (e.g., Electric/hybrid vehicles, biodiesel).

Next Steps

Long Term Capital Planning

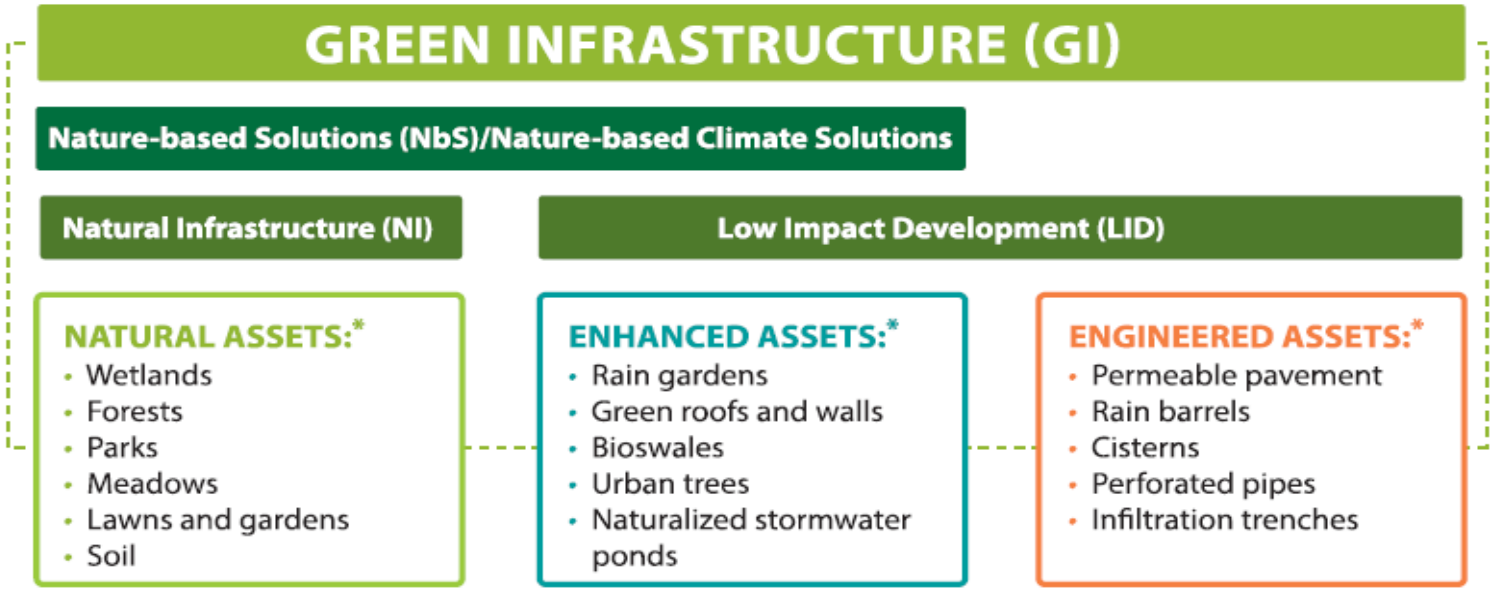
- Defined asset level of service measures will inform TRCA's short- and long-term capital plans.
- Prioritization based on:
  - Risk mitigation
  - Cost reduction
  - Asset optimization
- Comprehensive review of reserve funds, and potential feasibility to create infrastructure specific reserves.

Enterprise Asset Management (EAM) Software

- TRCA uses PSD Citywide as its EAM solution.
- EAM supports TRCA's Asset Management Program through:
  - Centralization and standardization of asset data.
  - Service level measurements via work order tracking.
  - Capital project planning.
  - Risk based decision making.
- Continue to socialize the use of EAM across the organization working with Senior Management team and relevant staff.
- Develop workflows to template asset data entry for ease of use and data integrity.

Integration of Green Infrastructure

- Green infrastructure is defined as natural and human-made elements that provide ecological and hydrological functions and processes.
- Green infrastructure can be subdivided into three main categories: natural assets, enhanced assets, and engineered assets.

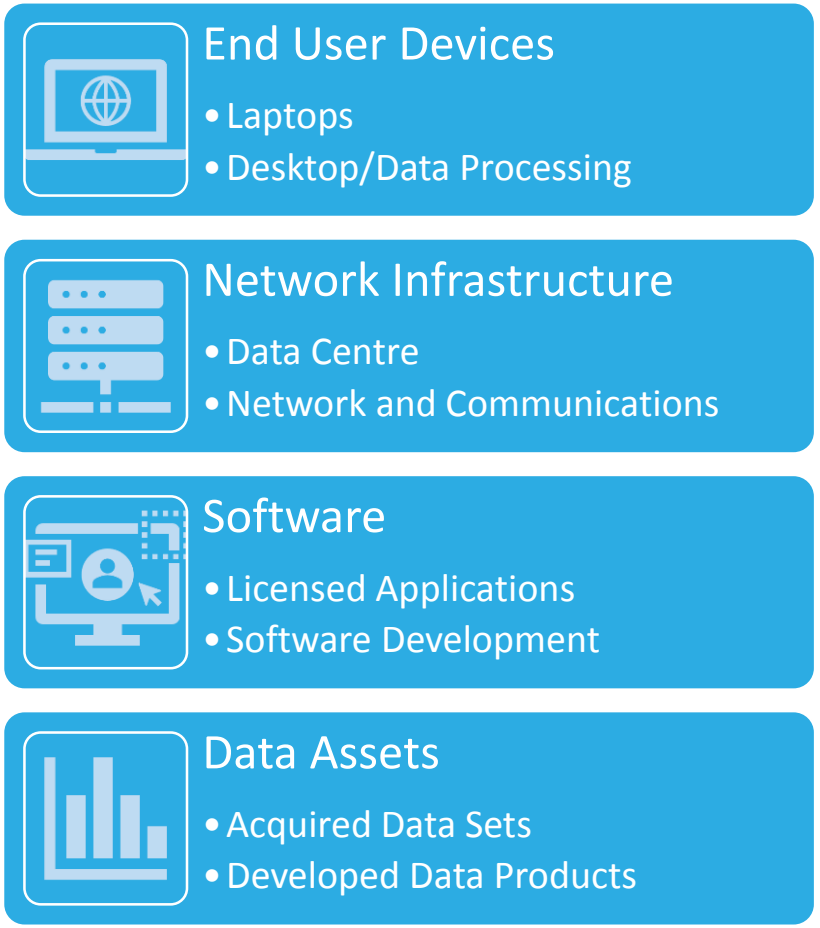


Integration of Green Infrastructure

- The integration project will involve significant coordination and collaboration between different TRCA divisions.
- Ongoing consultation with internal SMEs to:
  - Identify related TRCA strategies and management plans to ensure alignment and minimize overlap (e.g. Forest Management Plan).
  - Meet with green infrastructure asset managers to introduce the process and benefits of asset management and decide on objectives for including specific green infrastructure assets in the process.
  - Aim to update the Asset Management Plan with Green Infrastructure Assets by 2026.

Integration of IT Infrastructure

- IT infrastructure encompasses tangible assets across end user devices, data centre and networks, software and data assets.
- An IT Asset Management (ITAM) plan is being developed as part of the Corporate Strategic Plan playbook, including a refresh and financing strategy.
- The ITAM will be incorporated in a future update of the corporate Asset Management Plan.



Timelines

Key Documents	Target Frequency (years)
Asset Management Policy	Every 5 Years
Asset Management Plan	2024- Every 5 Years
State of Asset Management	Every 2 Years

- The Asset Management Plan is a living document that will continue to reflect the evolution of asset management practices within TRCA.
- TRCA has adopted a preliminary 10-year projection window for the first version of the AMP.
- The targeted timelines for the review and ,if needed, updates to the Asset Management Program are outlined in the table

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Toronto and Region Conservation Authority

Section III – Items for Information of the Board of Directors

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Sameer Dhalla, Director, Development and Engineering Services

RE: **PORT LANDS FLOOD PROTECTION AND ENABLING INFRASTRUCTURE PROJECT UPDATE**

KEY ISSUE

A progress update on the Port Lands Flood Protection and Enabling Infrastructure Project and the associated Broadview and Eastern Flood Protection Project.

RECOMMENDATION

THAT the update on progress on the Port Lands Flood Protection and Enabling Infrastructure Project and the Broadview Eastern Flood Protection Project, be received.

BACKGROUND

The Toronto Port Lands Flood Protection and Enabling Infrastructure Project is one of the most ambitious and large-scale urban environmental remediation and flood protection efforts in North America. Its primary goal is to flood protect and transform a 290-hectare area of waterfront at the mouth of the Don River, where flood risk and industrial pollution have historically impeded development. The Project, along with the associated Broadview Eastern Flood Protection Project is at the forefront of comprehensive urban remediation and flood resilience efforts, with an impact expected to enhance Toronto's environmental, economic, and social landscapes for decades.

Historically, approximately 290 hectares of the Port Lands, East Harbour and South Riverdale at the mouth of the Don River at Lake Ontario in the City of Toronto were vulnerable to flooding under a Regulatory flood event (a Hurricane Hazel-scale storm). In 2004, Toronto and Region Conservation Authority (TRCA) and the Toronto Waterfront Revitalization Corporation (now Waterfront Toronto) initiated the Don Mouth Naturalization and Port Lands Flood Protection Project Environmental

Assessment (DMNP EA) to explore opportunities to provide Regulatory flood protection, establish a naturalized river mouth, and facilitate redevelopment of the Port Lands (map provided in presentation).

Related to the DMNP EA, the Broadview and Eastern Flood Protection EA (BEFP EA) was a collaborative effort with the City of Toronto, Waterfront Toronto, and TRCA as co-proponents, and part of a larger flood protection initiative which includes the Lower Don River West Remedial Flood Protection project. The Lower Don West project was completed in 2012 and protects the West Don Lands neighbourhoods and parts of downtown Toronto. The BEFP EA Preferred Alternative, identified in 2021, is the final component of flood protection in the Lower Don area of Toronto. The Preferred Alternative is a flood protection landform to be constructed parallel to the east side of the Don Valley Parkway and Don River, south of Eastern Avenue (map in presentation).

Waterfront Toronto and TRCA staff requested approvals and provided updates to the Board for both EA projects over the course of planning and implementation at previous meetings:

At Authority Meeting #3/15, on March 27, 2015, Resolution #A38/15 provided staff direction to work in conjunction with the City of Toronto, Waterfront Toronto, Toronto Port Lands Company (now CreateTO), and others to further develop project schedules, budgets, and the planning approach for preliminary design and due diligence studies related to the Lower Don Lands, and the Don Mouth Naturalization and Port Lands Flood Protection Project.

At Authority Meeting #7/16, held on September 23, 2016, staff provided an update on the status of funding to proceed with detailed design and construction. The report included information on the Port Lands Flood Protection and Enabling Infrastructure (PLFPEI) Due Diligence Report which was completed to provide greater certainty on the costs, risks, scheduling and implementation strategy associated with the proposal to naturalize the mouth of the Don River and provide flood protection to the area.

At Authority Meeting #5/17, held on June 23, 2017, a staff update was received on the Eastern and Broadview Flood Protection EA (thereafter referred to as the Broadview and Eastern Flood Protection Project) and

Resolution #A104/17 was passed directing staff to update the Board on the Stage 1 Due Diligence Study upon completion.

At Authority Meeting #7/17, held on September 22, 2017, the Board approved staff to award Contract #10005518 for professional consulting services related to the planning and management for the Broadview and Eastern Flood Protection Due Diligence and Municipal Class EA.

At Authority Meeting #5/19, held on May 24, 2019, the Board received an update under resolution #A87/19 from Waterfront Toronto on detailed design and permit review and early site preparation activities which commenced in 2018 in advance of excavation and construction. Also at this meeting, an update on the Broadview and Eastern Flood Protection Project Stage 1 Due Diligence phase was received and Resolution #A88/19 was passed directing staff to update the Authority with the results of the Stage – 2 Class EA phase of the Project.

On March 13, 2020, at Executive Meeting #1/20, the Executive Committee granted approval under resolution #B8/20 of the permit for Waterfront Toronto's proposed works to build the structures which form the new Don River valley and adjacent wetlands.

At the Board of Directors meeting held on 30 April 2021, an update on staff progress on the Port Lands Flood Protection and Enabling Infrastructure Project and the Broadview Eastern Flood Protection Project EA, accompanied by a presentation by Waterfront Toronto, were received under resolution #A78/21. At that meeting, a related closed session report was also considered by the Board.

Approximately 40 permits have been issued to date for this project including the following major permits:

- Permit C-200273 (CFN 62381) at Executive Committee meeting held on March 13, 2020, for the construction of the new Don River channel and associated valley, approved under resolution #B8/20.
- Permit C-211035 (CFN 65394) at Executive Committee meeting held on September 10, 2021, for the reconstruction of the Lake Shore Boulevard bridge over the Don River, widening of Lake Shore Boulevard (Don Roadway to Carlaw Avenue), relocation of the existing rail spur line, removal of the Gardiner Logan ramps and

construction of the associated public realm, approved under resolution #B87/21.

- Permit C-211222 (CFN 64532) at Executive Committee meeting held on October 8, 2021, for the construction of the interim Sediment and Debris Management Area (SDMA) located on the west side of the Don River, approved under resolution #B96/21.
- Permit C-220858 (CFN 64901) at Executive Committee meeting held on June 10, 2022 for the construction of a flood protection landform along the redeveloped Don Roadway (Lakeshore Boulevard East to just south of Commissioners Street), approved under resolution #B59/22.

A major milestone was reached with connection of the new Don River mouth to Lake Ontario in 2024. Waterfront Toronto expects the new Don River to be fully operational by January 2025, with parks open to the public in June 2025. As the Port Lands Flood Protection Enabling Infrastructure works near substantial completion, staff are working closely with Waterfront Toronto and the City of Toronto on the upcoming transfer of ownership to the City, as well as the long-term operations, maintenance, and surveillance (OMS) activities for the future river and valley lands and flood infrastructure features.

Detailed design for the full Broadview Eastern Flood Protection Landform is at the 60% stage, with 90% design expected for November 2024, and construction planned to commence in 2025, subject to handover of the BMW property for start of construction. The BEFP substantial completion date remains December 2027.

RATIONALE

Providing flood protection for the Port Lands was identified as a TRCA priority in the 1980s. TRCA's interest in naturalizing the Don River mouth has been a shared priority with the City of Toronto and the broader community as identified by the Task Force to Bring Back the Don's report "Taking Back the Don" in 1991. The 1992 "Regeneration: Royal Commission on the Future of the Toronto Waterfront" report also outlined the federal interest in the Lower Don, and provincial support aligned with these initiatives when all three levels of government jointly established the Toronto Waterfront Revitalization Corporation in 2001. As such, the current detailed design and implementation of Waterfront Toronto's 23 enabling infrastructure sub-projects of the PLFPEI is the culmination of close to 40

years of consultation and planning, with TRCA at the forefront throughout the process.

Central to the Port Lands project, naturalizing the mouth of the Don River will not only facilitate flood protection for more than 240 hectares of land, but will also result in the creation of over 1,000 metres of new river channel and establish and enhance 30 hectares of new aquatic, wetland, and terrestrial habitat in the river valley. New parks and public realm features on lands outside the floodplain will comprise an additional 16 hectares of public greenspace. Together with the Broadview Eastern Flood Protection Landform, these works will unlock the development potential of this prime waterfront area by transforming the underutilized, post-industrial site into a vibrant, mixed-use, sustainable community which will support Toronto's growth and economic competitiveness.

TRCA has a significant stake in the Port Lands project due to our role as co-proponent of the original DMNP EA and BEFP EA. TRCA also has a legislated responsibility to issue permits under the *Conservation Authorities Act (2024)*, and to monitor compliance with the conditions of the DMNP EA. Additional interests also include flood mitigation, erosion control structures to control water flow and manage sediment/debris, and management of the ecology and natural asset infrastructure.

Relationship to TRCA's 2023-2034 Strategic Plan

This report supports the following Pillar and Outcome set forth in TRCA's 2023-2034 Strategic Plan:

Pillar 4 Service Excellence:

4.3 Responsive relationships and a trusted brand with a reputation for excellence

FINANCIAL DETAILS

The current delivery agreement between TRCA and Waterfront Toronto for the Port Lands Flood Protection Enabling Infrastructure Project is in effect until March 31, 2025, for the sum of $8,088,282, under account 191-20.

The current delivery agreement between TRCA and the City of Toronto for the Broadview Eastern FPL is in effect until December 31, 2024, for the sum of $314,000 under account 191-76.

DETAILS OF WORK TO BE DONE

Through TRCA's fee for service delivery agreement, staff provided a variety of technical support services and expertise to Waterfront Toronto during the detailed design and construction phases. As the Port Lands reaches substantial completion and handover to the City of Toronto is planned to begin in 2025, staff continue to provide technical support to Waterfront Toronto and the City of Toronto for inspections of various assets as they are completed, to provide assurance to the City that the assets are ready for acceptance.

Infrastructure Planning and Permits staff continue to work with Waterfront Toronto to identify permit requirements under Ontario Regulation 41/24 based on the current permit approval processes.

TRCA also conducts environmental monitoring and completes annual EA compliance reports to the provincial Ministry of the Environment, Conservation and Parks, in partnership with Waterfront Toronto and in consultation with the City of Toronto, the other DMNP EA co-proponents. Staff developed a post-construction EA compliance monitoring plan which will be supported by a new delivery agreement with Waterfront Toronto for 2025 until the end of the 5-year EA compliance monitoring period in 2029.

Staff also developed annual operations and maintenance plans for the long-term management of the Port Lands river valley and the future Sediment and Debris Management Area in collaboration with the City of Toronto for activities commencing 2025.

Report prepared by: Maryam Iler, Senior Manager, Restoration and Infrastructure; Sharon Lingertat, Senior Manager, Infrastructure Planning and Permits; Steven Heuchert, Associate Director, Development Planning and Permits; Hon Lu, Senior Project Manager, Restoration and Infrastructure
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Date: November 1, 2024

Section III – Items for the Information of the Board

TO: Chair and Members of the Board of Directors
Friday, November 22, 2024 Meeting

FROM: Laurie Nelson, Director, Policy Planning

RE: **FINALIZING TRCA STRATEGIES AND PLANS REQUIRED BY REGULATION UNDER THE CONSERVATION AUTHORITIES ACT**

KEY ISSUE

To inform the Board that Toronto and Region Conservation Authority (TRCA) staff are finalizing the Strategies and Plans required of all conservation authorities by Ontario Regulation 686/21: Mandatory Programs and Services (the Regulation) under the Conservation Authorities Act by December 31, 2024, as prescribed in the Regulation.

RECOMMENDATION:

WHEREAS staff reported to the Board in September 2023 on the Mandatory Programs and Services Regulation requirement for TRCA Strategies and Plans to be completed by all conservation authorities by December 31, 2024;

WHEREAS staff committed to reporting back to the Board on TRCA's progress and completion of the required Strategies and Plans by December 31, 2024;

IT IS RECOMMENDED THAT the report on Finalizing TRCA Strategies and Plans Required by Regulation under the Conservation Authorities Act, be received;

AND FURTHER THAT TRCA's Clerk so advise the Ministry of Natural Resources, Conservation Ontario, and TRCA's municipal partners.

BACKGROUND

Ontario Regulation 686/21, the Mandatory Programs and Services Regulation (the Regulation), requires all conservation authorities to have complete by December 31, 2024:

- Flood and Erosion Infrastructure Operational Plan;
- Flood and Erosion Infrastructure Asset Management Plan;
- Ice Management Plan;
- Land Inventory;
- Conservation Area Strategy; and
- Watershed-based Resource Management Strategy.

At Board of Directors Meeting held on September 22, 2023, Resolution #A152/23 was approved as follows:

> IT IS RECOMMENDED THAT the report, TRCA Strategies and Plans Required by the Mandatory Programs and Services Regulation under the Conservation Authorities Act, and any input on the proposed All Strategy Engagement Plan approach be received;
>
> AND FURTHER THAT staff report back to the Board on the progress and completion of the Strategies and Plans as described in this report.

RATIONALE

Many of TRCA's existing programs and plans fulfill or exceed the information requirements or components of the strategies and plans required by the province. Examples of already completed/existing components include:

- Several TRCA watershed plans;
- Flood Infrastructure Asset Management Plan;
- Erosion Control Infrastructure Asset Management Plan;
- Operations, Maintenance, and Surveillance manuals for all TRCA dams;
- Trail Strategy for the Greater Toronto Region; and
- Greenspace Acquisition Project 2021-2030.

Since Fall 2023, staff have been working to ensure the strategic work of these programs and plans is consolidated and documented, leveraged, and updated where needed to match the requirements of the Regulation for each document.

The following is a summary of each of the required Strategies and Plans and confirms that they are compliant with the Regulation.

Ice Management Plan

The Ice Management Plan (IMP) is required to document how ice may increase the risk of natural hazards, and the steps needed to mitigate these risks, including identifying equipment and resources to carry out these steps.

TRCA has an existing ice monitoring program since there are known areas within the jurisdiction that are at risk of flooding from ice jams. TRCA's IMP contains the above required components, including an action plan to mitigate the risk of ice jam flooding. Information in the IMP includes monitoring details, roles and responsibilities, notification tables, and site response.

The existing TRCA IMP was modified to meet the regulatory requirements for IMPs. Also, in accordance with the Regulation, TRCA's IMP may be updated from time to time as TRCA considers it advisable.

Flood and Erosion Control Infrastructure Operational Plans

The regulatory requirements are that an authority shall provide programs and services that support the operation, maintenance, repair and decommissioning of water control and erosion control infrastructure the authority owns or manages.

Flood Control Infrastructure Operational Plan

Any water control infrastructure must be for the purpose of mitigating the risks to life and damage to property resulting from flooding or to assist in flow augmentation. In addition, the programs and services for water control infrastructure must include the development and implementation of an operational plan. TRCA's Flood Control Infrastructure Operational Plans are compliant in that they document the purpose, operation, maintenance, inspection, operating regimes, and other actions required to safely manage dams, flood control channels, and dikes. TRCA owns 12 dams, 9 flood control channels, and 8 dikes and flood walls.

TRCA is compliant with Canadian Dam Association and Ministry of Natural Resources requirements to have Operation, Maintenance, and Surveillance (OMS) manuals in place for dams. TRCA has developed OMS manuals for the flood control channels and dikes/flood walls. These OMS manuals meet the intent of the required Flood Control Infrastructure Operational Plan.

Erosion Control Infrastructure Operational Plan

The Regulation states that the programs and services for erosion control infrastructure must include the development and implementation of an operational plan. The operational plan, implemented through TRCA's Erosion Risk Management Program (ERMP), allows for the monitoring, maintenance, and remediation of erosion control assets constructed to protect essential infrastructure and safeguard the public from the risk of erosion hazards. Regular and post-storm inspections, based on erosion control asset condition, provide the data for monitoring records used to assess erosion control asset deficiencies.

The maintenance and remediation priorities of TRCA's erosion control assets are reviewed annually through the analysis of erosion hazard risk, protected asset consequence of failure, and the erosion control asset condition. Maintenance and remediation works are implemented where municipal funding allows.

TRCA's ERMP meets the intent of the required Erosion Control Infrastructure Operational Plan. TRCA owns 29 shoreline erosion control systems and 253 valley and river erosion control systems.

Flood and Erosion Control Infrastructure Asset Management Plans

The regulation states that the programs and services for flood and erosion control infrastructure shall include the development and implementation of an asset management plan. Asset management plans identify lifecycle requirements, and associated costs required to balance service levels with customer expectations, and technical and environmental considerations each year. TRCA Asset Management Plans are guided by TRCA's Asset Management Policy.

Flood and Erosion Control Infrastructure Asset Management Plans have been prepared for inclusion in TRCA's first Asset Management Plan of its core assets and will be part of the overall Asset Management Program.

Conservation Area Strategy

The Conservation Area Strategy guides what programs and services TRCA offers on lands that it owns and/or manages. It helps TRCA continue to be a leader in the protection and enhancement of our conservation areas and greenspaces.

The Conservation Area Strategy includes the following components:

- A Land and Water Acknowledgement prepared in collaboration with Indigenous rightsholders;
- Objectives that provide high-level context and direction for actions related to lands owned or controlled by the TRCA. These are founded on the pillars and objectives of TRCA's Strategic Plan 2023-2034 where conservation areas are integral to program delivery;
- Identification of mandatory and non-mandatory programs and services on lands owned or controlled by TRCA, and the sources of funding required to support these programs and services. These reflect the programs and services reported to TRCA's Board of Directors and identified to our municipal partners during Memorandum of Understanding discussions, including:
    - Category 1 programs and services are set out in the legislation and by regulation;
    - Category 2 programs and services are agreed to by participating municipalities through the annual budget process.; and
    - Category 3 programs and services will continue to be funded outside the municipal levy (e.g. grants, service level agreements, self-generated revenue, etc.);
- Assessment of augmenting natural heritage and integration with other public lands and trails. The directions provided in TRCA's Terrestrial Natural Heritage System Strategy, Updated Regional Target Natural Heritage System, Integrated Restoration Prioritization (IRP) process, and Trail Strategy for the Greater Toronto Region support the objectives established in the Conservation Area Strategy;
- Land use categories, based on the types of activities that are engaged in on each parcel of land or other matters of significance such as provincial and municipal land use plan designations (e.g., Greenbelt Plan) related to the parcel. These categories are then used to classify lands in TRCA's Land Inventory; and
- Commitment to review and update the Conservation Area Strategy, including review by First Nations communities, Indigenous peoples, stakeholders and the public every 5-10 years, depending on need and resources.

The Conservation Area Strategy will be made available on the TRCA website.

Land Inventory

The Land Inventory identifies every parcel of land that TRCA owns or controls, and provides information for each parcel as required in the Regulation, such as but not limited to:

- Location;
- Ownership type;
- Acquisition date; and
- Land use category, as identified in the Conservation Area Strategy.

TRCA has secured a total of 2,296 properties in fee simple, amounting to 16,396.83 hectares (40,517.45 acres) as of Q3 2024.

The land inventory will be updated periodically by TRCA staff.

Watershed-based Resource Management Strategy

The Watershed-based Resource Management Strategy (the Watershed Strategy) will help TRCA and partner municipalities guide how future watershed plans are developed and updated. These watershed plans are TRCA's blueprint for sustainable development, ensuring that our rivers, wetlands and surrounding lands thrive for generations to come.

The Watershed Strategy that TRCA has prepared complies with the Regulation and includes the following components:

- A Land and Water Acknowledgement prepared in collaboration with Indigenous rightsholders;
- Guiding principles and objectives that provide high level context and direction for watershed plans;
- Recognition of the importance of Integrated Watershed Management (IWM) and the need to consider all natural components of a watershed, mandatory and supporting, together with social and economic factors, for watersheds to be healthy and resilient;
- Recognition that watershed plans will continue to be one of the primary means by which detailed recommendations will be made for management actions to comprehensively address watershed issues within TRCA's jurisdiction, which are then implemented through various programs and services;
- A summary of the many studies and monitoring programs upon which TRCA relies to guide decision-making;
- How TRCA programs and services are reviewed for compliance with

the Regulation and the process for adapting programs and services where needed;
- Taking a risk-based approach, a schedule to advance the renewal of each of our watershed plans is included to ensure that they are both up to date with respect to science and policy and that they address the geographical areas where updated knowledge is needed most; and
- Commitment to review and update the Watershed-based Resource Management Strategy including review by First Nations communities, Indigenous peoples, stakeholders and the public every 5-10 years, depending on need and resources.

The Watershed Strategy will be made available on the TRCA website.

All Strategy Engagement Plan

As required by Ontario Regulation 686/21: Mandatory Programs and Services, the Conservation Area Strategy and the Watershed Strategy each required public consultation during the development of the strategies. TRCA staff coordinated consultation on these strategies in early 2024 through meetings with municipal partners, First Nation communities and Indigenous peoples, the Regional Watershed Alliance, and the TRCA Building Industry and Land Development Association (BILD) Working Group.

Public input on the guiding principles and/or objectives of the Conservation Area Strategy and the Watershed Strategy was received through online surveys. A social media campaign was launched as the surveys went live on May 1, 2024, with posts and video messages to drive engagement before the surveys closed on June 30, 2024.

Staff also sought input through consultation on other TRCA initiatives such as watershed plans, the Trail Strategy and land management plans through public and partner meetings for those initiatives.

Individual stakeholder meetings were held upon request. Below is a summary of feedback heard through consultations.

First Nations and Indigenous Communities

- Supported the inclusion of a Land and Water Acknowledgement in the strategies;

- Suggested identifying the need to recognize both Western and Indigenous knowledge systems and ways of being;
- Supported the IWM approach; however, suggested recognizing the roles and responsibilities of Indigenous peoples in caring for land and water;
- Suggested recognizing the importance of natural heritage systems to Indigenous values; and
- Suggested recognizing that good decision-making requires collaboration amongst all partners, stakeholders, and Indigenous peoples and access to data and information.

Municipalities

- Comments from municipal staff were supportive of the guiding principles and/or objectives for both strategies; and
- Requests for clarity largely centered on definition of mandatory and non-mandatory programs and services and how municipal funding is assigned to these programs and services through the regular budgeting process.

Regional Watershed Alliance

- Comments from the Regional Watershed Alliance were very supportive with no major changes suggested for the documents.

BILD

- No comments were received.

Public

- 48 surveys completed, and 88% of respondents agreed or strongly agreed with the objectives proposed for the Conservation Area Strategy;
- 39 surveys completed, and 82% of respondents agreed or strongly agreed with the guiding principles and objectives proposed for the Watershed Strategy; and
- Suggestions for improving the guiding principles and/or objectives were made through open-ended comments, and feedback was considered and incorporated, as appropriate.

Relationship to TRCA's 2023-2034 Strategic Plan

This report supports the following Pillars and Outcomes set forth in TRCA's

2023-2034 Strategic Plan:

Pillar 1 Environmental Protection and Hazard Management:

1.1 Deliver provincially mandated services pertaining to flood and erosion hazards

Pillar 1 Environmental Protection and Hazard Management:

1.2 Leadership in greenspace conservation

Pillar 3 Community Prosperity:

3.1 Connect communities to nature and greenspace

Pillar 4 Service Excellence:

4.4 Transparent decision making and accountable results

FINANCIAL DETAILS

The development of these Plans and Strategies was funded by the regular budgets of TRCA divisions responsible for completing this work. Implementation of any recommendations will be conducted through TRCA's regular budget process and in accordance with the Conservation Authorities Act and its regulations.

DETAILS OF WORK TO BE DONE

All required Strategies and Plans are now complete. The Conservation Area and Watershed Strategies will be posted on the TRCA website (https://trca.ca/about/conservation-authorities-act-strategies/), as required by Ontario Regulation 686/21: Mandatory Programs and Services, and correspondence will be distributed to municipal partners, Conservation Ontario and the Minister of Natural Resources.

Report prepared by: Laura Del Giudice, Associate Director, Watershed Planning and Ecosystem Science; Deanna Cheriton, Senior Manager, Conservation Lands; Mary-Ann Burns, Senior Manager, Planning Policy and Regulation
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