2024 Peel Climate Change Performance Measurement System
Final Report

Prepared in Consultation with KPMG

May 2025

Credit Valley Conservation
inspired by nature

Toronto and Region Conservation Authority

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1.0 Introduction

Since 2007, the Region of Peel has provided climate change special levy funding to its partner Conservation Authorities (CAs), Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC), to address unfunded and underfunded activities that combat the impacts of climate change. Since 2007 this funding has totalled more than $200 million. In 2024, the total investment by Region of Peel was $19,802,999 ($11,636,999 for CVC and $8,166,000 for TRCA), with the Program Area breakdowns detailed in Table 1 below. This report covers 91% of this investment in alignment with the system methodology.

Program Area	Funding ($)
Climate Science	1,017,367
Flood Management	2,095,838
Erosion Management	836,000
Restoration and Natural Heritage Science	3,955,064
Forest Management	1,519,152
Green Infrastructure	4,360,752
School Programs	1,985,894
Community Engagement and Stewardship	2,186,091
Greenhouse Gas (GHG) Emissions Reduction	Incorporated above

Table 1: Region of Peel climate change special levy funding totals by program area in 2024

In 2016, Peel Council approved the Peel-CA Climate Change Budget Risk Methodology (CCBRM). This multi-step process determines the level of risk and priority for current and proposed programs/projects for a particular budget year. This information is reported by Peel-CAs to Council through the annual budget process using the categories: Act, Invest, and Sustain.

Through the development of the CCBRM, the need to create a set of Key Performance Indicators (KPIs) was identified. The KPIs would assist with understanding the impact of the climate levy and provide feedback on program performance. KPMG Canada was retained to provide expertise in advancing the need to measure the effectiveness of the funded programs as contributors to the Region's desired Peel Climate Change Master Plan (CCMP) outcomes. In 2021, the resulting Peel Climate Change Performance Measurement System (the "Measurement System") was created, together with KPIs, to systematically track and report on the performance of program areas on an annual basis. Specifically, the Measurement System is designed to answer:

- How well each of the program areas are performing.
- Where improvements can be made within the various program areas.
- How regional investments are achieving shared climate change outcomes.

This annual report summarizes the 2024 Measurement System results for Region of Peel staff. These yearly reports, based on this consistent framework, support internal review of Peel-CAs' budget submissions in an integrated way, increase alignment across agencies, and provide clarity on how regional investments are achieving shared climate change outcomes. This is the fourth annual report published to advance these goals.

1.1   Measurement System Development

In developing the Measurement System, a consistent methodology established shared Key Performance Indicators (KPIs) that measure the collective performance of TRCA and CVC climate change initiatives. It aligns 44 cost centres between TRCA and CVC into eight program areas (each with its own performance indicator), and calculates a greenhouse gas (GHG) emissions reduction/sequestration value. These program areas and the corresponding KPIs are presented through three performance groupings: Adaptation, Knowledge and Awareness, and Mitigation.

The performance indicators use a qualitative approach to provide information regarding the likelihood of a program area achieving defined goals. This is a recognized distinction from the certainty defined by program evaluation. The KPIs are presented as point-in-time scores, measuring performance relative to the established objective for each program area. Table 2 on the following page shows the nested relationships that form the framework of this Measurement System.

The Measurement System uses various methodologies including expert panels, user reviews and participant surveys. It draws from best practices in the field of performance measurement and places emphasis on ease of implementation by prioritizing annual replicability while minimizing subjectivity using templates and a defined scoring system. Methodologies use reviewers who are familiar with the activities and outputs being assessed and experts who are knowledgeable about the program area or specific objective being measured. These experts and reviewers are from outside the program area and may represent staff from municipalities, agencies or other government organizations.

Annually, questions and recommendations arise that serve to strengthen the underpinning processes related to data acquisition, calculations and report preparation. Improvements implemented during the 2024 reporting cycle include:

- Refinements to the review process to address and provide guidance on multi-year and shared outputs and projects.
- Documentation of specific GHG protocols, ensuring methodology is clear, per industry-wide standards used, and repeatable.
- Revisions to certain co-benefits to improve alignment with the methodology utilized for their identification and incorporation of these statements into the program area performance reports.

Table 2: Peel Climate Change Performance Measurement System Framework

Program Area The grouping of accounts funded through the Climate Change Special Levy.	Program Area Objective What the funding primarily seeks to achieve in the medium-term time scale. The Measurement System was designed to measure how the Program Area performs against this goal.	Performance Indicator The assessment used to measure work towards the Program Area Objective.	Data Sources The method(s) used to obtain data to assess the Performance Indicator.	Performance Model & Long-Term Goals What the funding and Program Areas ultimately seek to influence.
Climate Science	Reduced negative impacts of climate change (due to the implementation of useful and effective plans for protection and recovery measures).	The usefulness of program area outputs for planning or implementing protection and recovery measures.	• User Rating	**Adaptation** **Protection:** to protect residents of the Region and the natural environment against climate change-related extreme weather events and **Recovery:** to facilitate recovery from the impacts of climate change that have occurred.
Flood Management	Minimize the risk of flooding (due to the construction and maintenance of protective infrastructure and the use of program area information for planning and implementing flood minimization measures).	The usefulness of program area outputs for planning and implementing flood minimization measures and protective infrastructure, as well as the benefits of flood protection infrastructure that is developed or maintained.	• User Rating • Value of Land (when applicable), a staff calculation	
Erosion Management	Minimize the risk of erosion (reduced risk of damage to infrastructure from erosion due to the maintenance and construction of erosion control structures).	The extent of implementation and maintenance of effective erosion risk reduction measures.	• Planned Versus Actual: a staff calculation • Asset Condition Score: a staff calculation	
Restoration and Natural Heritage Science	Reduced impacts of climate change-related extreme weather events on flooding, erosion, water quality degradation, species and natural features (due to restoration projects and the usefulness of natural heritage-related research).	Reduced impacts of climate change-related extreme weather events through enhancements to the natural heritage system and the usefulness of research information for implementing climate change protection measures.	• Expert Panel • User Rating	
Forest Management	Increased forest health and ability to withstand climate change-related extreme weather events (due to forest management and the removal of hazard trees).	Increased ability of forests to withstand climate change-related extreme weather events through the implementation of forest management measures.	• Expert Panel	
Green Infrastructure	Reduced risks of degradation of water resources and terrestrial natural systems (due to water quality and/or quantity problems such as floods and stormwater overload).	The usefulness of program area outputs for implementing measures to reduce the degradation of water resources and/or terrestrial natural systems.	• User Rating	
School Programs	Positive changes in the behaviour of students regarding support for, and participation in, climate change adaptation and mitigation activities.	The extent of changes in knowledge, awareness, and attitudes of students.	• Teacher / Student Surveys	**Knowledge & Awareness** Increase **Knowledge & Awareness** of Region's residents to motivate behaviour change.
Community Engagement and Stewardship	Positive changes in behaviour regarding support for and participation in climate change adaptation and mitigation activities.	The extent of changes in knowledge, awareness, and attitudes of program participants.	• Participant Surveys	
Greenhouse Gas Emissions (GHG) Reduction	GHG emissions reduced or sequestered through climate change initiative programs that have significant activities directed toward GHG emissions reduction or have GHG emissions reduction/carbon sequestration as a tangible co-benefit.	The amount of GHG emissions reduced annually through emissions reduction measures and carbon sequestration.	• CO2e Calculations	**Mitigation** Net reduction in GHG emissions.

1.2   Measurement System Scoring

Consistent with past reports, the 2024 report provides an overall score for each program area, a summary of how well each of the program areas is performing and information that can be used to identify program improvements.

All indicators are calculated on a 1 to 5 scale, where 5 = Very Effective, and 1 = Not Effective (Figure 1).

0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Not Effective	Minimally Effective	Moderately Effective	Effective	Very Effective

Figure 1: Peel Climate Change Performance Measurement System Scale

2.0 2024 Performance Report

2.1 2024 Performance Report Highlights

- All of the eight (8) program areas scored as either Effective or Very Effective in achieving the program area objective. Seven (7) of the eight (8) programs scored as Very Effective.

- Scores ranged from 3.8 to 4.8 out of 5.0.

- There was little variation between the 2023 and 2024 scores for all program areas, resulting in no changes to the rating category on the Measurement System scale. Seven (7) of the eight (8) program area scores were within 7% of their 2023 scores and the remaining score was within 12%.

- All scores were within the 20% acceptable variance from the previous year. This variance threshold is based on best practices in performance measurement systems.

- 3,413 CO2e were reduced in 2024 and 547 tonnes of CO2e sequestration capacity were added in 2024. A total cumulative capacity of 1,807 tonnes from planting efforts executed between 2021 and 2024 has been achieved, signalling 29.4% progress made towards the 2030 sequestration capacity target.

- 85 individuals were involved in this project in 2024 including members of the oversight team, champions who act as program area co-ordinators, data collection leads, reviewers, expert panel members from external organizations and an external performance measurement expert.

- A total of 56 outputs, projects and programs were reviewed by six organizations including Lower-Tier Municipalities, Region of Peel, Ministry of Natural Resources and Toronto Metropolitan University. Feedback was also received from hundreds of student volunteers, teachers and members of the public.

2.2 Performance Report Structure

The following performance report consists of two parts:

- Part 1: Overview Performance Report (2.3) – This section includes a one-page overview table which provides the KPI score as well as the rating and percent change for the main objectives of each of the eight program areas as well as GHG emissions reduction. The program areas are grouped and reported according to the three overarching Measurement System models: Adaptation, Knowledge and Awareness, and Mitigation.

- Part 2: Program Area Performance Reports (2.4) – This section includes a one-page summary report for each of the eight program areas, as well as one for GHG emissions reduction. These reports provide high-level information on program area actions and the main factors that affected the performance results. Detailed program area performance reports – including actions/activities undertaken, program area methodology, identified co-benefits and explanation of the rating – can be found in Appendix A.

2.3   Overview Performance Report

ADAPTATION PERFORMANCE

Program Area	Program Area Objective	Score /5.0	Rating	Change from 2023 (%)
Climate Science	Reduced negative impacts of climate change (due to the implementation of useful and effective plans for protection and recovery measures).	4.3	**Very Effective**	-7%
Flood Management	Minimize the risk of flooding (due to the construction and maintenance of protective infrastructure and the use of program area information for planning and implementing flood minimization measures).	4.8	**Very Effective**	+4%
Erosion Management	Minimize the risk of erosion (reduced risk of damage to infrastructure from erosion due to the maintenance and construction of erosion control structures).	4.8	**Very Effective**	+12%
Restoration and Natural Heritage Science	Reduced impacts of climate change-related extreme weather events on flooding, erosion, water quality degradation, and species and natural features (due to restoration projects and the usefulness of natural heritage-related research).	4.4	**Very Effective**	-4%
Forest Management	Increased forest health and ability to withstand climate-related extreme weather events (due to forest management and the removal of hazard trees).	4.4	**Very Effective**	-2%
Green Infrastructure	Reduced risks of degradation of water resources and terrestrial natural systems (due to water quality and/or quantity problems such as floods and stormwater overload).	4.7	**Very Effective**	+4%

KNOWLEDGE AND AWARENESS PERFORMANCE

Program Area	Program Area Objective	Score /5.0	Rating	Change from 2023 (%)
School Programs	Positive changes in the behaviour of students regarding support for and participation in climate change adaptation and mitigation activities.	**4.5**	**Very Effective**	+2%
Community Engagement and Stewardship	Positive changes in behaviour regarding support for and participation in climate change adaptation and mitigation activities.	**3.8**	**Effective**	-3%

MITIGATION PERFORMANCE

Greenhouse Gas Emissions (GHG) Reduction / Sequestration	GHG emissions reduced or sequestered through climate change initiative programs that have significant activities directed toward GHG emissions reduction or have GHG emissions reduction/carbon sequestration as a tangible co-benefit. • Sequestration target of 6137 tonnes of CO2e by 2030	**On track to reach sequestration target**	**29.4% progress to goal**

2.4 Program Area Performance Reports

ADAPTATION PERFORMANCE REPORT

CLIMATE SCIENCE   **Budget: $1,017,367**

Objective	Score
Reduced negative impacts of climate change (due to the implementation of useful and effective plans for protection and recovery measures).	**4.3** ▼ **Very Effective**

Actions

- Applied research and monitoring of climate change impacts, risk factors and adaptation measures with a focus on ecosystem and watershed health (water quality, flooding, erosion, extreme heat and ecosystem biodiversity).

- Knowledge dissemination, advice and training to support climate change-related strategies and plans for external (municipalities) and internal (CAs) users (for example: risk assessments, screening tools, carbon offset plans).

Results

- Reviewers rated program outputs from highly useful to very highly useful in informing municipal and conservation authority decision making and resource management.

- Program outputs provided useful tools for recognizing climate change impacts, identifying solutions, and prioritizing implementation of climate change adaptation and resiliency actions.

- Reviewers acknowledged that data generated by the climate science program outputs would have direct and immediate impacts on existing programs including road salt management, water resource and watershed management, energy management, forest management and flood reduction.

- Recommendations for improvement include: increased communication between CAs and Peel Region for flood risk assessment projects, process improvements for inventory and condition assessments of green infrastructure on Peel Region roads, and increased monitoring of Microbial Source Tracking (MST) along with its integration in climate change adaptation monitoring.

Co-benefits

Environmental Benefit

Applied research and monitoring of climate change impacts supports the development of positive actions (i.e., increased tree planting, reduced use of road salt), which benefit the natural environment. Biodiversity plays a critical role in supporting human population health by ensuring the provision of essential ecosystem services, including clean air and water, as well as temperature regulation.

Health Benefit

New data and knowledge of climate change impacts and nature-based climate solutions support the development of better-informed decisions on how people and communities can adapt to climate change and improve their health outcomes (i.e., reduction of human exposure to bacteria in urban creeks, potential to improve detection of toxic algae near drinking water sources.)

Social and Quality of Life Benefits

The dissemination of knowledge and information about climate change issues, impacts and adaptation measures increases residents' understanding of environmental issues and their impact on their local natural environment, which forms the basis for community action and behaviour change.

ADAPTATION PERFORMANCE REPORT

FLOOD MANAGEMENT

Budget: $2,095,838

Objective	Score

Minimize the risk of flooding (due to the construction and maintenance of protective infrastructure and the use of program area information for planning and implementing flood minimization measures).

4.8

Very Effective

Actions

- Construction and/or maintenance of flood protection infrastructure (in some years).

- Development and dissemination of information regarding flood probabilities, potential flood impacts, and flood minimization options.

Results

- Reviewers found the program to be very highly useful overall in providing valuable real-time data for flood emergency response and mapping and monitoring data to inform planning and flood/climate adaptation to reduce flood risk.

- Program outputs produced useful information that is timely and meets the needs of users for short-term planning and response as well as decisions with longer time horizons.

- Areas for improvement cited include: specific data and/or resource requests including mapping and infrastructure; improvements to data communication including access in real time and simplifications of explanations for certain user groups (local emergency managers); improved integration within teams (Road Vulnerability Study); streamlined processes for efficiency gains; and broader collaboration across Region of Peel working groups (GIS, hydraulic model groups).

Co-benefits

Financial Benefit

$ Modelling and mapping products identify locations of stormwater outfalls and municipally owned infrastructure at risk of erosion damage, which inform efficient and effective emergency preparedness planning and prioritize asset management to meet provincial requirements.

Social and Quality of Life Benefits

In flood-prone areas, knowledge of current flood conditions in real time, enables appropriate emergency and community responses.

Environmental Benefit

Flood plain mapping updates identify areas suitable for protection and form the basis for the establishment of large natural corridors for flora and fauna.

ADAPTATION PERFORMANCE REPORT

EROSION MANAGEMENT

Budget: $836,000

Objective	Score

Minimize the risk of erosion (reduced risk of damage to infrastructure from erosion due to the maintenance and construction of erosion control structures).

4.8

Very Effective

Actions

- Inspection and maintenance of existing erosion control infrastructure.

- Construction of new erosion control structures to protect high-priority sites where Region of Peel sanitary infrastructure or watermains may be at risk.

Results

- Implementation of the annual plan for the Region of Peel was very effective, with remediation completed as planned at the Hazelwood Park Sanitary Infrastructure showcase project.

- Remediation at the Crawley Park project saw slight delays on account of the July and August storms, with completion scheduled for early 2025 at all five sites within the project area.

- 611 infrastructure hazard monitoring sites were inspected in the 2024 monitoring season, in addition to 11 critical priority sites.

- 35 erosion control structures were built in the previous five years, inspected in 2024, and assessed to be in sound condition.

Co-benefits

Health Benefit

Protecting buried linear infrastructure from erosion hazards also provides an opportunity to protect publicly accessible parklands and trails adjacent to these municipal assets during remediation work. This, in turn, provides safe and secure access to outdoor activities and enables positive physical and mental health outcomes in the community.

Environmental Benefit

The natural assets (e.g., trees, shrubs, etc.) adjacent to Peel's buried linear infrastructure threatened by erosion hazards, are also protected from failure caused by erosion during remediation work completed to protect the municipal assets themselves.

ADAPTATION PERFORMANCE REPORT

RESTORATION AND NATURAL HERITAGE SCIENCE   **Budget: $3,955,064**

Objective	Score

Reduced impacts of climate change-related extreme weather events on flooding, erosion, water quality degradation, species and natural features (due to restoration projects and the usefulness of natural heritage-related research).

4.4

Very Effective

Actions

- A wide range of restoration projects (aquatic and wetland restoration, riparian and valley restoration, stream and natural channel restoration, and terrestrial restoration), as well as the implementation of Low Impact Development (LID) and natural green infrastructure projects.

- Natural heritage-related research that assesses climate change vulnerability and the effectiveness of habitat management practices, mapping of significant wildlife habitat, and impact thresholds to guide the management and conservation of wildlife.

Results

- All restoration projects were assessed by the expert panel as having a very high impact on climate change adaptation, specifically in four impact areas: reduced flooding, reduced erosion, reduced water quality degradation, and reduced negative impacts on species and natural features.

- Projects that demonstrated a more holistic approach, where different types of restoration techniques were connected and integrated into one project, stood out with the expert panel. One example of this was a project that incorporated reforestation and meadow restoration at a large scale as part of a large land acquisition.

- The ratings and comments from the reviewers examining research-based outputs identified the significance of these outputs in dealing with climate change, enhancing the management of natural assets, and encouraging collaboration among stakeholders. They recognized that the outputs offer crucial insights for policy development and practical strategies for carrying out climate change protection measures, all while promoting informed decision-making and ongoing improvement.

- The only noted recommendations for improvement pertain to increased collaboration, possibly through in-person meetings to better share experience and transfer knowledge, and to continue to collaborate on the cross-cutting theme of health and biodiversity to inform decision-making.

RESTORATION AND NATURAL HERITAGE SCIENCE

Co-benefits

Social and Quality of Life Benefits

Research that prioritizes conservation and the protection of trees, forests and green infrastructure provides the community with access to healthy green spaces which supports positive mental, emotional and cultural connections to nature and enhanced opportunities for outdoor recreation and exercise.

Financial Benefit

Implementation of restoration and natural green infrastructure projects can also provide the catalyst for the rehabilitation of failing infrastructure and the protection/realignment of accessible public trails during the restoration work itself, which reduces the need for ongoing maintenance and repair.

Environmental Benefit

Restoration, protection and enhancement of the natural system contributes to improved biodiversity of the system by creating thriving and resilient habitats that facilitate the movement of species within connected corridors.

ADAPTATION PERFORMANCE REPORT

FOREST MANAGEMENT   **Budget: $1,519,152**

Objective	Score

Increased forest health and ability to withstand climate-related extreme weather events (due to forest management and the removal of hazard trees).

4.4

Very Effective

Actions

- A wide range of forest monitoring, inventory, management planning, outreach and stewardship activities.

- Active management projects and programs to address:

  - Forest health and disease prevention

  - Canopy expansion

  - Invasive species

  - Hazard trees

  - Resilience to extreme events

Results

- Experts felt that the programs had a very high impact on the resiliency of forest systems and demonstrated leadership in the sector, particularly as municipalities do not directly undertake these kinds of programs.

- Component programs within the program area implemented a comprehensive and wide-ranging suite of management actions to produce a holistic approach towards forest management in the region.

- Forest management topics for further examination include adapting to decreasing private land availability through invasive plant management to create new plantable locations, as well as increasing resources and workshops available to assist the public in learning about and managing fire risk. A holistic approach to forest management that incorporates invasive species monitoring and management was also proposed.

Co-benefits

Financial Benefit

$ Forest management programs support the advancement of Conservation Authorities' knowledge, expertise and understanding of forest management practices and are used to leverage additional funding to support other municipal forest management programs and deliverables.

Social and Quality of Life Benefits

Healthy forests and expanded tree and forest canopy resulting from effective forest management practices help to reduce the urban heat island effect and provide an improved experience for the public when visiting local parkland and greenspaces.

Environmental Benefit

Strategic planning undertaken as an element of forest management programs, targets key areas for forest health improvement and expansion, and can result in improved ecosystem health for the larger system (e.g., enhanced biodiversity, improved corridor connectivity for significant species and soil stabilization in erosion-prone areas).

ADAPTATION PERFORMANCE REPORT

GREEN INFRASTRUCTURE
Budget: $4,360,752

Objective	Score

Reduced risks of degradation of water resources and terrestrial natural systems (due to water quality and/or quantity problems such as floods and stormwater overload).

4.7

Very Effective

Actions

- Development of integrated stormwater asset management process and procedures for municipalities including design and construction reviews, rapid assessments, inspections and monitoring of green engineered infrastructure to support life cycle management.

- Transfer of knowledge on green stormwater infrastructure to increase adoption of integrated stormwater management (SWM) practices

- Neighbourhood stormwater management projects with a focus on Low Impact Development (LID) implementation.

Results

- Programs were rated from highly to very highly useful for providing training on the implementation, inspection and maintenance of LID and SWM projects.

- Reviewers praised the program for effectively building education and awareness at both community and operational levels, with tailored training that strengthened municipal staff capacity and supported integration into Peel's asset management system.

- The projects were seen as critical for inventory development, regulatory compliance, and risk-informed planning, while also advancing innovative asset management practices and aligning with broader city and regional strategies.

- Recommendations for improvement include improved work planning, streamlining certain initiatives offered, increased project update meetings and integration with various Peel working groups. Leadership on the inconsistent use of technical stormwater management jargon was sought, requiring collaboration at all levels (conservation authorities, municipalities, private industry).

Co-benefits

Social and Quality of Life Benefits

Increased opportunities to participate in local climate action strengthen the community's connection to and appreciation for nature and enhance community cohesion by working together towards common goals.

Environmental Benefit

Knowledge/information sharing and capacity building between conservation authorities, municipalities, residents and businesses at the neighbourhood scale enables more tailored and effective solutions for the local natural environment.

KNOWLEDGE AND AWARENESS PERFORMANCE REPORT

SCHOOL PROGRAMS **Budget: $1,985,894**

Objective	Score
Positive changes in the behaviour of students regarding support for, and participation in, climate change adaptation and mitigation activities.	**4.5** ▼ **Very Effective**

Actions

- Planning and delivery of climate change-related education and awareness programs for students and professional development training for teachers.

Results

- Programs were rated effective to very effective in encouraging students' participation in climate change adaptation and mitigation activities. The majority of teachers and students agreed or strongly agreed that the programs increased students' knowledge of nature, the environment, and the impacts of climate change.

- Teachers appreciated that environmental education and in-school programming included the positive impact of hands-on learning activities which kept students involved and provided them with practical learning experiences related to nature, the environment and climate change. Many educators appreciated activities like planting native species, games, and interactive lessons.

- Youth volunteers indicated they appreciated the opportunity to learn new things – particularly about climate change, invasive species and conservation. The variety of activities undertaken and sense of accomplishment that was obtained was enjoyable.

- Areas for improvements include: expanding on opportunities to continue the post-program application of learning at schools, resource considerations (more time for hands-on activities, wider variety for follow-up materials and funding for transportation), and mitigating, as much as possible, the negative experiences related to environmental considerations (heat, cold, insects).

Co-benefits

Social and Quality of Life Benefits

Outdoor education programs related to climate change awareness and education strengthen students' connection to, and appreciation for, nature and the natural environment, and result in students having a broader perspective of the world they live in and their role in protecting the environment.

Social and Quality of Life Benefits

Educational programming related to climate change awareness and environmental education provide a foundation to advance a range of personal development skills such as leadership, mentorship, cooperation, and volunteerism, that are valuable skills both for the student and in our society.

Health Benefit

Outdoor education programs related to climate change awareness and education provide an opportunity for students to be active and spend time outdoors in nature, which provides physical and emotional health benefits that are important aspects of healthy growth.

KNOWLEDGE AND AWARENESS PERFORMANCE REPORT

COMMUNITY ENGAGEMENT AND STEWARDSHIP　　　　　**Budget: $2,186,091**

Objective	Score
Positive changes in behaviour regarding support for and participation in climate change adaptation and mitigation activities.	**3.8** ▼ Effective

Actions

- Planning and delivery of climate change-related education, engagement and stewardship programs to the community.

Results

- The five contributing programs in this program area were rated from effective to very effective in encouraging support for and participation in climate change adaptation and mitigation activities.

- Program participants – including community members, landowners, and corporate partners – engaged in a variety of community actions including tree plantings, land and water stewardship, and climate action and resilience projects on both public and private lands.

- Participants indicated in post-program surveys that their experiences helped them to better understand the impacts of climate change and equipped them with the information and tools necessary to engage in meaningful community action towards climate adaptation and mitigation in the future. Widespread feedback received noted staff knowledge, expertise and well-run events that enabled knowledge gain and motivated action.

- Areas for improvement include transitioning to digital administrative processes and higher quality and increased program promotion for more program uptake by broad audiences.

COMMUNITY ENGAGEMENT AND STEWARDSHIP

Co-benefits

Social and Quality of Life Benefits

Participation in volunteer, hands-on, nature-based programming that improves the natural environment and local resiliency against the impacts of climate change provides an opportunity for like-minded people to work together towards a common goal, supporting community cohesion, relationship building, networking, and increased landowner and community capacity.

Environmental Benefit

Volunteer and landowner actions such as tree planting help to create neighbourhoods, landscapes, and ecosystems that are more climate change-resilient and biodiverse.

Health Benefit

Participation in physical, hands-on climate change adaptation and mitigation activities such as tree planting provides an opportunity for people to spend time being active outdoors, which supports improved physical, mental and emotional health.

MITIGATION PERFORMANCE REPORT

GREENHOUSE GAS (GHG) EMISSIONS REDUCTION/SEQUESTRATION

Objective	Score
Amount of GHG emissions reduced annually through emissions reduction measures and carbon sequestration. • Sequestration target of 6,137 tonnes of CO2e	**On Track** To Reach Sequestration 2030 Goal **29.4% Progress**

Actions

Measures GHG emissions reduction and sequestration activities in the following five program areas – Climate Science, Forest Management, Green Infrastructure, School Programs, and Community Engagement and Stewardship.

Activities include:

- Support for projects to reduce GHG emissions for CA-owned facilities within the Region of Peel (building retrofits, fleet electrification and fuel-switching projects).

- Engagement programs to facilitate community-based GHG emissions reduction projects.

- Atmospheric GHG removals through CA-led tree, shrub and seedling plantings (sequestration).

Note: A 2030 sequestration capacity target has been established at 6,137 tonnes of CO2e, a joint CA target based on projected 10-year planting plans. Sequestration capacity refers to the CO2e absorption made possible by the annual planting of trees and shrubs funded by the Region of Peel. Both the annual sequestration capacity addition and progress towards the target are reported annually.

Results

- **3,413 tonnes of CO2e** emissions reduced through building, solid waste and industry process retrofit projects in 2024.

- **547 tonnes of CO2e** sequestration capacity was added in Peel Region in 2024 (sequestration capacity refers to the amount of emissions that are able to be captured and stored through tree, shrub and seedling plantings).

- Cumulative annual sequestration capacity reached **1,807 tonnes of CO2e** due to planting efforts executed in 2021, 2022, 2023 and 2024.

3.0 Adding Value through Co-Benefits

Co-benefits can be defined as the positive results that occur in addition to the primary benefits associated with the main program area objective. They provide added value that is not currently reflected in the scoring framework. Co-benefits are often included in climate change discussions, as they demonstrate the ways in which climate action can help advance other broader societal, environmental or economic goals in important, though less direct, ways. While research emphasizes the importance of recognizing co-benefits, the methodology for identifying and reporting them is still emerging.

In 2022, a pilot project introduced an approach to identify and integrate co-benefits into the performance report. In 2023, this methodology was refined to ensure consistency across all program areas, with program staff identifying significant co-benefits based on user feedback and expertise. To be included in the measurement system, a co-benefit must meet two criteria: it must be a distinct value-add to the program area objective and must be significant. Co-benefits are significant when they are attributable and material. The identified co-benefits that met these criteria were then aligned to the application of co-benefits in the Region of Peel's Climate Change Master Plan.

In 2024, the co-benefits identified in 2023 were reviewed using the same methodology to ensure their continued relevance and to confirm they were distinct from the main program area objective. They were updated based on this review and were then incorporated into the program area performance report summaries found in section 2.4 of the report.

4.0 Next Steps

Continuous improvement considerations remain a priority for the ongoing development and refinement of this Measurement System. The overall goal of ensuring integration and practical alignment with the Region's needs remains an area of focused dedication. To this end, the following next steps are recommended:

- Pursue opportunities to serve our partner municipal client needs, particularly as Region of Peel continues to advance and enhance their Climate Change Master Plan and set priorities. Ongoing dialogue is essential to ensuring CA programs and services and the Measurement System are well understood and positioned for the needs of the future.

- Assess whether all desired audiences for this analysis and reporting are being reached and optimize report timing to help inform decision-making at different levels. This includes ensuring CA audiences receive feedback for improvements and Region of Peel audiences are aware of this annual assessment to inform future fiscal planning processes.

- Considerations for making the Measurement System results more accessible (i.e., dashboards) and interactive using a digital layout have been initiated and it is recommended this work continues through collaborative input.

- Build into the process for future years the solicitation of feedback on process improvements for the Measurement System itself from program area staff, reviewers and expert panel members. For example, a review of guidance provided to reviewers has been identified as an area benefiting further refinements.

APPENDIX A:
Detailed Program Area Reports

ADAPTATION PERFORMANCE REPORT

CLIMATE SCIENCE   **Budget: $887,405**

Objective	Score
Reduced negative impacts of climate change (due to the implementation of useful and effective plans for protection and recovery measures). **Performance indicator used to measure the objective:** The usefulness of program area outputs for planning or implementing protection and recovery measures.	**4.3** ▼ **Very Effective**

1.0 Actions

• Applied research and monitoring of climate change impacts, risk factors and adaptation measures with a focus on ecosystem and watershed health (water quality, flooding, erosion, extreme heat and ecosystem biodiversity).

• Knowledge dissemination, advice and training to support climate change-related strategies and plans for external (municipalities) and internal (CAs) users (for example: risk assessments, screening tools, carbon offset plans).

2.0 How the indicator score was calculated

The calculation was based on the ratings of four programs or parts of programs:

Applied Research Programs:

CVC Program(s):
• Water and Climate Change Risk Science (internal component) – Not rated in 2024 *
• Real-Time Water Quality Response (2 outputs rated)

TRCA Program(s):
• Climate Science Applications Program (5 outputs rated)

Seven representative outputs were selected from the contributing programs. A description of each output was provided to an intended user of that output, who rated the output based on their assessment of **how useful (or potentially useful) the output was (or will be) in planning or implementing climate change adaptation measures.** A 1-5 scale with predetermined criteria was provided to support users in developing their rating (5= Very highly useful or potentially useful, 1= of low or no potential usefulness). The ratings were averaged, after weighting them by their program budgets, to calculate the overall indicator score.

In 2024, deliverables for CVC's Water and Climate Change Risk Assessment program (internal component only) were not included in the rating as they did not contribute to the program area objective. They will instead be considered under GHG emissions reduction as outcomes for the program more clearly align with the mitigation logic model.

3.0 Explanation of the rating

The reviewers responded positively to this program area citing that many of the new data sets and knowledge gained and shared help them to understand existing conditions as well as possible future conditions. The majority cited the use of the output(s) at the time of review with the information as valuable, even "invaluable", noting the benefit of accessing resources and knowledge that would otherwise not be available.

The data and analysis produced was determined to be very helpful in informing decision-making and management actions for Peel and local municipalities. An ability to proactively influence decisions that will help tackle issues was cited as an important benefit. Some examples of issues pertinent to this year's outputs include the urban heat island effect, the regional road network flood vulnerability and land use change assessments. The ability to inform asset management and capital planning through the information generated and shared was also cited. For some of the projects, the level of collaboration between the CAs and Peel were highlighted as strengths.

Recommendations for improvements: flood risk assessment projects would benefit from greater communication and integration with benefitting departments within Peel and CAs. Inventory and condition assessments of Green Infrastructure on Peel Region roads would benefit from inspection and analysis process improvements. Higher rainfall volumes are predicted as a result of climate change, and with it the higher probability of mixing sewer and sanitary water. The recommendation to increase monitoring of Microbial Source Tracking (MST) and integrate it into Climate Change adaptation monitoring would provide opportunities to quickly identify issues and rectify pollutant impacts in local water bodies.

4.0 Co-benefits

Environmental Benefit - Applied research and monitoring of climate change impacts supports the development of positive actions (i.e. increased tree planting, reduced use of road salt) which benefit the natural environment. Biodiversity plays a critical role in supporting human population health by ensuring the provision of essential ecosystem services, including clean air and water as well as temperature regulation.

Health Benefit - New data and knowledge of climate change impacts and nature-based climate solutions supports the development of better-informed decisions on how people and communities can adapt to climate change and improve their health outcomes (i.e. reduction of human exposure to bacteria in urban creeks, potential to improve detection of toxic algae near drinking water sources.

Social and Quality of Life Benefits - The dissemination of knowledge and information about climate change issues, impacts and adaptation measures increases residents' understanding of environmental issues and their impact on their local natural environment which forms the basis for community action and behaviour change.

ADAPTATION PERFORMANCE

FLOOD MANAGEMENT   **Budget: $2,095,838**

Objective	Score
Minimize the risk of flooding (due to the construction and maintenance of protective infrastructure and the use of program area information for planning and implementing flood minimization measures). **Performance indicator used to measure the objective:** The usefulness of program area outputs for planning and implementing flood minimization measures and protective infrastructure, as well as the benefits of flood protection infrastructure that is developed or maintained.	**4.8** **Very Effective**

1.0 Actions

- Construction and/or maintenance of flood protection infrastructure (in some years).

- Development and dissemination of information regarding flood probabilities, potential flood impacts, and flood minimization options.

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the ratings of four programs or parts of programs that contribute to the program area objective:

Applied Research Programs:

CVC Program(s):
- Climate Change Flood Risk Assessment (3 outputs rated)
- Flood Forecasting and Warning (3 outputs rated)
- Water and Climate Change Risk Science (external component) (3 outputs rated)

TRCA Program(s):
- Flood Remedial Works (non-infrastructure portion) (3 outputs rated) *

Flood Protection and Infrastructure Programs:

TRCA Program(s):
- Flood Remedial Works (flood protection infrastructure portion) *

The calculation was carried out in two parts:
Part 1 – Three representative outputs were selected from each of the applied research programs or part of a program for a total of 12 outputs. A description of each output was provided to an intended user of that output, who rated the output based on their assessment of **how useful (or potentially useful) the output was (or will be) for minimizing flood risks**. A 1-5 scale with predetermined criteria was provided to support users in developing their rating (5 = very highly useful, 1 = of low or no potential usefulness). The rating for each of these programs was the average of their output ratings.

Part 2 – The value of the land and property that has been **protected from flooding due to the implementation of flood protection infrastructure** was estimated. This program was rated on a 1-5 scale with predetermined criteria (5 = value of protected land and property > 4 times program infrastructure funding, 1 = value of protected land and property is < program infrastructure funding) based on the value of protected land and property compared with the funding that was used for infrastructure activities.

The five ratings were averaged, after weighting them by their program budgets, to calculate the overall indicator score.

In 2024, TRCA's Flood Remedial Works program was sub-divided into two parts – non-infrastructure work and flood protection infrastructure work – as both types of work were completed within the year. Each portion was rated separately and contributed to the final score for the overall indicator.

3.0 Explanation of the rating

The Flood program area has received an overall rating of 4.8 out of 5, signifying the program's importance to reducing flood risk within the Region. Extreme rainfall events in 2024 underscored the importance of reducing flood risks to the community and environment, in light of climate change.

10 out of 12 respondents indicated that the information provided from these programs was used to inform 10 municipal flood management initiatives, demonstrating value for effort. The other 2 in-progress programs will include outputs in 2026. In some cases, the data is considered "critical", is used daily, and by a large variety of stakeholders in various ways. The effective and efficient sharing of data is cited as an important benefit resulting in the protection of Ontarians and their properties.

The program and outputs for Flood Management result in capital planning decisions being informed by evidence and improved understanding pertaining to climate change vulnerability in both the present and future. The knowledge generated improves resource allocation and prioritization – both in the short term (i.e. for response activities), as well as in the long term (i.e. to inform capital expenditure investments).

Increased awareness was also cited as a strength of this program area, resulting in usefulness for future flood resilience efforts and planning. Timeliness and accessible technical data is a strength – particularly the high value of information from real-time gauges, networks and systems. However, there was also interest in obtaining access to, or acquiring, new specific data and/or resources (field rating curves, regular status updates, more mapping of high velocity areas, high-risk flood area monitoring infrastructure). User-driven data needs were identified - the provision of access in real-time for certain user groups and the simplification of data for others (local emergency managers). Improved integration within teams, streamlined processes for efficiency gains, and broader collaboration across Region of Peel working groups (GIS, hydraulic model groups) was also recommended.

4.0 Co-benefits

Financial Benefit - Modelling and mapping products identify locations of stormwater outfalls and municipally-owned infrastructure at risk of erosion damage which inform efficient and effective emergency preparedness planning and prioritize asset management to meet provincial requirements.

Social and Quality of Life Benefits - In flood-prone areas, knowledge of current flood conditions in real-time, enables appropriate emergency and community responses.

Environmental Benefit - Floodplain mapping updates identify areas suitable for protection and form the basis for the establishment of large natural corridors for flora and fauna.

ADAPTATION PERFORMANCE

EROSION MANAGEMENT   **Budget: $836,000**

Objective	Score
Minimize the risk of erosion (reduced risk of damage to infrastructure from erosion due to the maintenance and construction of erosion control structures). **Performance indicator used to measure the objective:** The extent of implementation and maintenance of effective erosion risk reduction measures.	**4.8** ▼ **Very Effective**

1.0 Actions

• Inspection and maintenance of existing erosion control infrastructure.

• Construction of new erosion control structures to protect high-priority sites where Region of Peel sanitary infrastructure or watermains may be at risk.

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the rating of one program that contributed to the program area objective:

Erosion Management Programs

TRCA Program(s):
• Erosion Maintenance Projects

The calculation was carried out in two parts.

Part 1 – This calculation involved determining the **extent to which the erosion control plan for the year was implemented**. This was done by assigning points to various categories of planned activities once the plan was finalized and then, at the end of the year, calculating the points associated with the actual projects that were carried out during the year. The score for Part 1 is the ratio of the points achieved to the points planned, converted to a 5-point scale with predetermined criteria (5= 80% or more of plan score completed, 1= 0-19% of plan score).

Part 2 – Using a specific assessment methodology, erosion control structures implemented or remediated within the previous five years are **inspected and given an asset condition score based on their current condition**. The score for each structure inspected is converted to a 5-point scale with predetermined criteria (5 = very good condition, 1 = very poor condition). The score for Part 2 is the average of the individual asset condition scores.

The ratings from Part 1 and Part 2 are averaged to calculate the overall indicator score.

3.0 Explanation of the rating

Implementation of the erosion management program was rated as very effective in 2024.

Part 1: Storms in July and August of this year tested the resources of our project management teams. The slight delay in the implementation of the Crawley Park project that the team had planned to bridge over 2024/2025 meant that the planned remediation of high-priority site P-133 will occur early in 2025 along with the other four sites in the project area. The Hazelwood Park Sanitary Infrastructure project was fully completed and restored in 2024, becoming a showcase project for the program's high-quality erosion control asset construction. The monitoring teams inspected 611 infrastructure hazard monitoring sites in addition to the 11 critical priority sites during the season in 2024.

Part 2: The twelve erosion control asset components added to the asset management inspection list through implementation of the Knightsbridge Park and Hazelwood Park projects were inspected in 2024 and had an average score of 4.58. The average score for the 35 erosion control asset components implemented between 2019-2023 (i.e., the last 5 years) is 4.57. The erosion control asset inspections confirm the lack of significant change observed in the most recently constructed Peel infrastructure hazard protection projects. The TRCA Erosion Hazard Monitoring team will continue to inspect these erosion control assets as part of its Erosion Control Asset Management Plan.

4.0 Co-benefits

Health Benefit - Protecting buried linear infrastructure from erosion hazards also provides an opportunity to protect publicly accessible parklands and trails adjacent to these municipal assets during remediation work. This, in turn, provides safe and secure access to outdoor activities and enables positive physical and mental health outcomes in the community.

Environmental Benefit - The natural assets (e.g., trees, shrubs, etc.) adjacent to Peel's buried linear infrastructure threatened by erosion hazards, are also protected from failure caused by erosion during remediation work completed to protect the municipal assets themselves.

ADAPTATION PERFORMANCE

RESTORATION AND NATURAL HERITAGE SCIENCE

Budget: $3,955,064

Objective	Score
Reduced impacts of climate change-related extreme weather events on flooding, erosion, water quality degradation, species and natural features (due to restoration projects and the usefulness of natural heritage-related research). **Performance indicator used to measure the objective:** Reduced impacts of climate change-related extreme weather events through enhancements to the natural heritage system and the usefulness of research information for implementing climate change protection measures.	**4.4** ▼ **Very Effective**

1.0 Actions

- A wide range of restoration projects (aquatic and wetland restoration, riparian and valley restoration, stream and natural channel restoration, and terrestrial restoration), as well as the implementation of Low Impact Development (LID) and natural green infrastructure projects.

- Natural heritage-related research that assesses climate change vulnerability and the effectiveness of habitat management practices, mapping of significant wildlife habitat, and impact thresholds to guide the management and conservation of wildlife.

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the ratings of nine programs that contribute to the program area objective:

Restoration and Protection Programs

CVC Program(s):
- Aquatic and Wetland Restoration (1 project rated)

TRCA Program(s):
- Wetland Restoration – Climate (1 project rated)
- Riparian and Valleyland Restoration – Climate (1 project rated)
- Stream Restoration – Climate (1 project rated)
- Terrestrial Restoration – Climate (1 project rated)
- Natural Channel Project Implementation (1 project rated)
- Green Infrastructure – Climate (1 project rated)

Applied Research Programs

CVC Program(s):
- Urban Natural Heritage (2 outputs rated)
- Biodiversity Conservation and Management (2 outputs rated)

The calculation was carried out in two parts.

Part 1 - One representative project was selected from each of the restoration and protection programs for a total of seven projects. A summary of each project was provided to a four-member expert panel composed of natural heritage, climate change and water resources experts from four municipal partner organizations. Expert panel members were asked to consider each project and develop a consensus rating for the projects based on their assessment of the **overall impact of each project on reducing the negative impacts of climate change-related extreme weather events**. As part of the rating process, consideration was also given to the projects impact on reducing flooding, reducing erosion, reducing water quality degradation, and reducing the negative impacts on species and natural features. A 1-5 scale with predetermined criteria was provided to support panel members in developing their rating (5 = very high impact on reducing the negative impacts of extreme weather events, 1 = very low or no impact on reducing the negative impacts of extreme weather events).

Part 2 - Two representative outputs were selected from each of the applied research programs for a total of four outputs. A description of each output was provided to an intended user of that output who rated the output based on their assessment of **how useful (or potentially useful) the output was (or will be) in planning or implementing climate change adaptation measures.** A 1-5 scale with predetermined criteria was provided to support users in developing their rating (5 = very highly useful, 1 = of low or no potential usefulness). The rating for each of these programs was the average of their output ratings.

The nine ratings were averaged, after weighting them by their program budgets, to calculate the overall indicator score.

3.0 Explanation of the rating

Panel members were very supportive of all the projects and saw value in them mitigating the impact of climate change. Projects were rated from high to very high, with an overall rating of 4.5. Common to the discussion was that these projects met all or most of the requirements that were being asked for in this review. Projects that demonstrated a more holistic approach where different types of restoration techniques were connected and integrated into one project stood out in the discussion.

The ratings and comments from the reviewers examining research-based outputs identified the significance of these outputs in dealing with climate change, enhancing the management of natural assets, and encouraging collaboration among stakeholders. They recognized that the outputs offer crucial insights for policy development and practical strategies for carrying out climate change protection measures, all while promoting informed decision-making and ongoing improvement.

The only noted recommendations for improvement pertain to increased collaboration possibly through in-person meetings to better share experience and transfer knowledge, and to continue to collaborate on the cross-cutting theme of health and biodiversity to inform decision-making.

4.0 Co-benefits

Social and Quality of Life Benefits - Research that prioritizes conservation and the protection of trees, forests and green infrastructure provides the community with access to healthy green spaces which supports positive mental, emotional and cultural connections to nature and enhanced opportunities for outdoor recreation and exercise.

Financial Benefit - Implementation of restoration and natural green infrastructure projects can also provide the catalyst for the rehabilitation of failing infrastructure and the protection/realignment of accessible public trails during the restoration work itself, which reduces the need for ongoing maintenance and repair.

Environmental Benefit - Restoration, protection and enhancement of the natural system contributes to improved biodiversity of the system by creating thriving and resilient habitats that facilitate the movement of species within connected corridors.

ADAPTATION PERFORMANCE

FOREST MANAGEMENT   **Budget: $1,519,152**

Objective	Score
Increased forest health and ability to withstand climate-related extreme weather events (due to forest management and the removal of hazard trees). **Performance indicator used to measure the objective:** Increased ability of forests to withstand climate change-related extreme weather events through the implementation of forest management measures.	**4.4** ▼ **Very Effective**

1.0 Actions

- A wide range of forest monitoring, inventory, management planning, outreach and stewardship activities.

- Active management projects and programs to address:
    - Forest health and disease prevention
    - Canopy expansion
    - Invasive species
    - Hazard trees
    - Resilience to extreme events

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the ratings of five programs that contribute to the program area objective:

Forest Management Programs

CVC Program(s):
- Invasive Species Control Programs
- Peel Planting Programs

TRCA Program(s):
- TRCA Forest Management – Peel
- Reforestation Program - Private Lands
- Peel Invasive Species Management

A summary of each of the five programs was provided to an expert panel composed of forestry and ecosystem experts from three municipal partner organizations. Expert panel members were asked to consider each program and develop a consensus rating based on their assessment of the programs' overall impact on the ability of forests to withstand climate change-related extreme weather events. A 1-5 scale with predetermined criteria was provided to support panel members in developing their rating (5 = very high impact on increasing forest resilience, 1 = very low or no impact on increasing forest resilience).

The five ratings were averaged, after weighting them by their program budgets, to calculate the overall indicator score.

3.0 Explanation of the rating

Overall, there was consensus supporting the high ratings for all the individual programs. Programs received high scores as they directly implement measures to improve forest health and resiliency. Programs that included a wider range of activities were rated higher, signaling the value of the diversifying nature of forest management needs to withstand climate change impacts (i.e. fire risk, invasive species management).

Many municipalities do not directly undertake programs such as early detection monitoring for pests and diseases, private land management, or active forest resiliency management. These programs serve as excellent models for others and are used by current partners to advance their own initiatives. Additionally, they focus on increasing public education and awareness, involving private landowners in forest management and planting efforts, and are recognized as model programs for their effective approaches.

Areas for further consideration and possible improvement include adapting to decreased private land planting opportunities by examining new models (including the creation of new plantable areas through invasive plant management as well as increased public engagement and education). The development of resources and workshops to enhance public awareness for private landowners and residents, specifically around fire risk, was also raised. Lastly, the merging of climate change programs that target monitoring invasive species through forest management was proposed for further examination.

4.0 Co-benefits

Financial Benefit - Forest management programs support the advancement of Conservation Authorities' knowledge, expertise and understanding of forest management practices and are used to leverage additional funding to support other municipal forest management programs and deliverables.

Social and Quality of Life Benefits - Healthy forests and expanded tree and forest canopy resulting from effective forest management practices help to reduce the urban heat island effect and provide an improved experience for the public when visiting local parkland and greenspaces.

Environmental Benefit - Strategic planning undertaken as an element of forest management programs targets key areas for forest health improvement and expansion, and can result in improved ecosystem health for the larger system (e.g., enhanced biodiversity, improved corridor connectivity for significant species and soil stabilization in erosion-prone areas).

ADAPTATION PERFORMANCE

GREEN INFRASTRUCTURE   **Budget: $3,980,753**

Objective	Score
Reduced risks of degradation of water resources and terrestrial natural systems (due to water quality and/or quantity problems such as floods and stormwater overload). **Performance indicator used to measure the objective:** The usefulness of program area outputs for implementing measures to reduce the degradation of water resources and/or terrestrial natural systems.	**4.7** ▼ **Very Effective**

1.0 Actions

- Development of integrated stormwater asset management processes and procedures for municipalities including design and construction reviews, rapid assessments, inspections and monitoring of green engineered infrastructure to support life cycle management.

- Transfer of knowledge of green stormwater infrastructure to increase adoption of integrated stormwater management (SWM) practices.

- Neighbourhood stormwater management projects with a focus on Low Impact Development (LID) implementation.

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the ratings of five programs, or parts of programs, that contribute to the program area objective:

Stormwater Management (SWM) / Low Impact Development (LID) Programs

CVC Program(s):
- Stormwater Science and Guidance
- Integrated Water Management Implementation
- Integrated Water Management Guidance and Training

TRCA Program(s):
- Sustainable Technologies (stormwater portion only)

Sustainable Neighbourhood Programs

CVC Program(s):
- Sustainable Neighbourhoods (Sustainable Neighbourhood Action Program) - stormwater portion only

TRCA Program(s):
- Sustainable Neighbourhood Retrofit Action Plan Program - stormwater portion only

Eleven representative projects were selected from the contributing programs (seven projects were selected from SWM/LID programs and four projects were selected from Sustainable Neighbourhoods programs). A description of each project was provided to an intended user of that project, who rated the project based on their assessment of **how useful (or potentially useful) the project was in implementing measures to reduce the degradation of water resources and/or terrestrial natural systems**. A 1-5 scale with predetermined criteria was provided to support users in developing their rating (5= very highly useful or potentially useful, 1= of low or no potential usefulness). The ratings were averaged, after weighting them by the program budgets, to calculate the indicator score.

3.0 Explanation of the rating

The green infrastructure program projects received very good responses indicating that these projects are or expected to be either an important or crucial input in implementing measures to reduce the degradation of water resources and/or terrestrial natural systems.

Reviewers commented on the success of building up education and awareness both at the community and operational levels. Outputs provided insightful and tailored training to municipal staff, building their capacity and ensuring successful integration with Peel's existing asset management network. Projects were cited as critical for inventory needs. They also support meeting regulatory requirements and improve asset management with new, innovative concepts. Other benefits cited include improved risk assessment due to better understanding of knowledge gaps, improving planning and financial considerations for mitigation. Lastly, this work aligns and supports city and region-led plans and strategies.

Recommendations for improvement include work planning to ensure project resourcing to avoid gapping and implementation delays, and streamlining the high number of initiatives, possibly resulting in higher impact. Increased ongoing project update meetings and increased integration with various Peel working groups were deemed beneficial. Technical jargon and inconsistent use of sector-based terminology by the different stakeholders (conservation authorities, municipalities, private industry) hamper comprehension and cohesion – standardization would require cross-sectoral collaboration and perhaps is best led by working groups or academic institutions.

4.0 Co-benefits

Social and Quality of Life Benefits - Increased opportunities to participate in local climate action strengthen the community's connection to and appreciation for nature and enhance community cohesion by working together towards common goals.

Environmental Benefit - Knowledge/information sharing and capacity building between Conservation Authorities, municipalities, residents and businesses at the neighbourhood scale enable more tailored and effective solutions for the local natural environment.

KNOWLEDGE AND AWARENESS PERFORMANCE

Budget: $1,985,894

Objective	Score
Positive changes in the behaviour of students regarding support for, and participation in, climate change adaptation and mitigation activities. **Performance indicator used to measure the objective:** The extent of changes in knowledge, awareness, and attitudes of students.	**4.5** Very Effective

1.0 Actions

• Planning and delivery of climate change-related education and awareness programs for students and professional development training for teachers.

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the ratings of six programs that contribute to the program area objective:

School Programs

CVC Program(s):
• Youth Outreach
• Environmental Education

TRCA Program(s):
• Environmental Leaders of Tomorrow
• Stewardship Partnership Services
• Conservation Youth Corps
• Eco-Schools Expansion Program

Each program, or part of a program, was rated based on surveys that **measured students' knowledge and attitudes toward climate change** following their participation in a school program. Surveys were administered directly to the students, where appropriate, or to the teacher, who provided their opinions regarding the extent of their students' learning. 689 survey responses were received. The ratings were averaged and weighted by the program budgets to calculate the overall indicator score.

3.0 Explanation of the rating

All programs in this program area were rated effective to very effective in changing students' behaviours regarding support for, and participation in, climate change adaptation and mitigation activities. The majority of students and teachers surveyed agreed or strongly agreed (4 or 5) that school program offerings supported an increase in knowledge regarding nature, the environment and the impacts of climate change.

All programs are experiential in nature and include an age- and audience-appropriate hands-on component. Programs take place at schools, in the community and at CVC and TRCA education facilities and sites. In 2024, qualitative data was collected from both teachers and students through the addition of two open-ended questions to the survey. The data collected helped to provide additional context and rationale for the component program scores.

Feedback obtained from youth volunteers engaged in Conservation Youth Corps programming indicated they appreciate the opportunity to learn new things – particularly about climate change, invasive species and conservation. The variety of activities undertaken, and a sense of accomplishment that was obtained, were enjoyable. Less enjoyable aspects cited included weather and insects. Considerations to better promote initial group interaction and cohesion were also mentioned by some of the youth. As stated directly by survey respondents:

- "The program gave me the chance to work closely with nature and receive a diverse outlook on the environment around me. It has encouraged me to be mindful towards my community and become responsible towards the environment."

- "I think it was tiring but we made a change"

- "Removing invasive species, I understand it is important but for student volunteers it gets discouraging when it is so repetitive."

Feedback from teachers regarding environmental education and in-school programming included the positive impact of hands-on learning activities, which kept students involved and provided them with practical learning experiences related to nature, the environment and climate change. Many educators appreciated activities like planting native species, games, and interactive lessons. Some teachers commented that they would appreciate access to more and a wider variety of hands-on learning programs and follow-up materials in the future, as well as additional funding support for transportation.

- "The guides/educators were so very knowledgeable and amazing with the students. I really appreciate the care they put in to teaching the students and keeping them safe. It's a beautiful spot and it's important for kids to be out in nature like this."

- "Great mix of activities, movement, games, and teaching"

- "More funding for busing to make it affordable for public school."

The majority of teachers agreed or strongly agreed that since participating, their students were more likely to know more about nature and the environment as well as take action directly to help care for nature and the environment.

- ""I think the staff do a great job at making the difficult task of teaching students about awareness of environmental issues accessible and fun."

- "The activities met our curriculum expectations".

New strategies will be required to address emerging patterns that have developed since the pandemic, including the uptake and level of interest in some programs (i.e., overnight excursions, programs with more risk), funding alignment optimization with school boards, and the timing of program offerings.

Educators participating in Peel EcoSchools expressed that the variety of support provided through the program has directly contributed to the success of their school in achieving EcoSchools certification and suggested that more resources could assist with supporting workload needs (documentation, reporting), and could provide for additional professional development for various school stakeholders besides teachers (i.e. administrators, custodians). As stated by participants directly:

- "We love our Eco Club - it is a club that all the students want to be involved in!"

- "The opportunities, resources and support all help with collective elevation of thought and action towards sustainability."

- "Thank you for all the resources, ideas and information you have provided over the past few years. It has made our job of bringing in environmental learning a much easier task."

Pertaining to the measurement system, the inclusion of an overall level of satisfaction rating by students and teachers is recommended to provide further data and context.

4.0 Co-benefits

Social and Quality of Life Benefits

- Outdoor education programs related to climate change awareness and education strengthen students' connection to, and appreciation for, nature and the natural environment, and result in students having a broader perspective of the world they live in and their role in protecting the environment.
- Educational programming related to climate change awareness and environmental education provides a foundation to advance a range of personal development skills such as leadership, mentorship, cooperation, and volunteerism, that are valuable skills both for the student and in our society.

Health Benefit - Outdoor education programs related to climate change awareness and education provide an opportunity for students to be active and spend time outdoors in nature, which provides physical and emotional health benefits that are important aspects of healthy growth.

KNOWLEDGE AND AWARENESS PERFORMANCE

COMMUNITY ENGAGEMENT AND STEWARDSHIP

Budget: $1,971,091

Objective	Score
Positive changes in behaviour regarding support for and participation in climate change adaptation and mitigation activities. **Performance indicator used to measure the objective:** The extent of changes in knowledge, awareness, and attitudes of program participants.	**3.8** ▼ Effective

1.0 Actions

• Planning and delivery of climate change-related education, engagement and stewardship programs to the community.

2.0 How the indicator score was calculated

The calculation of the overall indicator was based on the ratings of six programs that contribute to the program area objective:

Community Engagement and Stewardship Programs

CVC Program(s):
• Peel Rural Stewardship
• Urban Outreach and Restoration
• Regional Community Outreach

TRCA Program(s):
• West Humber Stewardship Program
• Etobicoke-Mimico Stewardship
• Etobicoke Headwaters Subwatershed Regeneration - Not rated in 2024 *

Each program was rated based on surveys that **measured participants' knowledge and attitudes toward climate change** following their participation in a community engagement program or activity. 385 survey responses were received. The ratings were averaged and weighted by the program budgets to calculate the overall indicator score.

In 2024, TRCA's Etobicoke Headwaters Subwatershed Regeneration program was not rated due to an administrative error.

3.0 Explanation of the rating

Program participants rated Community Engagement and Stewardship programs as very effective and effective toward behaviour changes that support climate change adaptation and mitigation activities. Programs scored from 3.3 to 4.3. 385 surveys were completed by participants and the response rate was 18%.

In 2024, qualitative data was collected through the addition of two open-ended questions to the survey. The data collected helped provide additional context and rationale to the component program scores. However, surveys for the Etobicoke Headwaters Subwatershed Regeneration program were erroneously not conducted in 2024, and as such, the program and its budget are not factored into this report. It is recommended that in 2025, an overall level of satisfaction rating by participants be calculated and included in the comments to provide context.

Participants reported meaningful experiences that were effectively and professionally organized and delivered. Common positive feedback themes focus on the skill level of staff, event delivery, and learning opportunities.

Expert-level knowledge of staff and sharing resources and tips, are of high interest to participants. These are valuable components of outreach and stewardship services that are sought out by residents. Staff teach and present with passion, inspiring participants to take on mitigation actions and change behaviour.

Event services, including pre-event registration and delivery, are reported to have been effective, informative, engaging, and well-run, with friendly, helpful, and personable staff. As stated directly by participants:

- "The entire experience from requesting a tree to the tree planting, was efficient and pleasant. The staff who planted the tree were knowledgeable and passionate about their work."

- "I thought the information was clear, the visuals were excellent. Liked the back and forth between the two presenters and the opportunity for Q and A and that you were willing to extend the discussion beyond the one hour."

- "Considerable knowledge and resources were shared to help me improve habitat on my property. "

- "Coming out and joining in this event got me out of my comfort zone and see the reality of the impact we have on the environment"

- "It was very well planned, fun and educational"

- "Great outdoor learning experience"

Program improvements are regularly considered and integrated based on participant and survey feedback. Notable recommendations for improvement in 2024 focused on program expansion and administration.

Program participants expressed interest in more events, activities, training, and trees to plant. This also includes access to technical experts and their knowledge. Participants recognize that more people could get involved if program communications improved (broader audience targeting, better quality materials, increased promotion).

Waivers and on-site safety talks are viewed as administrative burdens, although they are required to take part in conservation authority outreach and stewardship programs. These elements of programming are highly unlikely to be removed, although a transition to digital from paper waivers is being considered.

4.0 Co-benefits

Social and Quality of Life Benefits - Participation in volunteer, hands-on nature-based programming that improves the natural environment and local resilience against the impacts of climate change provides an opportunity for like-minded people to work together toward a common goal, supporting community cohesion, relationship building, networking, and increased landowner and community capacity.

Environmental Benefit - Volunteer and landowner actions such as tree planting help to create neighbourhoods, landscapes, and ecosystems that are more climate change resilient and biodiverse.

Health Benefit - Participation in physical hands-on climate change adaptation and mitigation activities such as tree planting provides an opportunity for people to spend time being active outdoors, which supports improved physical, mental and emotional health.

MITIGATION PERFORMANCE

GREENHOUSE GAS (GHG) EMISSIONS REDUCTION/SEQUESTRATION

Objective	Score
Reduction of GHG emissions in the Region of Peel. **Performance indicator used to measure the objective:** Amount of GHG emissions reduced annually through emission reduction measures and carbon sequestration. • Sequestration target of 6,137 Tonnes of CO2e	On Track To Reach Sequestration 2030 Goal 29.4% progress

Score:

Total GHG emissions reduction / sequestration
*An effectiveness score for GHG emissions reduction and sequestration activities combined is under ongoing development.

For sequestration only, there has been 29.4% progress toward the 2030 established goal of 6,137 tonnes of CO2e.

1.0 Actions

Measures GHG emissions reduction and sequestration activities in the following five program areas – Climate Science, Forest Management, Green Infrastructure, School Programs, and Community Engagement and Stewardship.

Activities include:
- Support for projects to reduce GHG emissions from CA-owned facilities within the Region of Peel (building retrofits, fleet electrification and fuel switching projects).
- Engagement programs to facilitate community-based GHG emissions reduction projects.
- Atmospheric GHG removals through CA-led tree, shrub and seedling plantings (sequestration).

2.0 How the indicator score was calculated

26 programs or parts of programs have the potential to contribute to the emissions reduction and/or carbon sequestration calculation each year:

EMISSIONS REDUCTION PROGRAMS:

CVC program(s):
• Water and Climate Change Risk Science (internal component only)

TRCA program(s):
• Sustainable Technologies
• Sustainable Neighbourhood Retrofit Action Plan Program
• Sector-Based Climate Mitigation Program
• Pearson Eco-Business Program

CARBON SEQUESTRATION PROGRAMS:

CVC program(s):
• Aquatic and Wetland Restoration
• Peel Planting Programs
• Sustainable Neighbourhoods (Sustainable Neighbourhood Action Program)
• Peel Rural Stewardship
• Urban Outreach and Restoration
• Regional Community Outreach
• Youth Outreach

TRCA program(s):
• Wetland Restoration – Climate
• Riparian and Valleyland Restoration – Climate
• Stream Restoration – Climate
• Terrestrial Restoration – Climate
• Natural Channel Project Implementation
• Green Infrastructure – Climate
• TRCA Forest Management – Peel
• Reforestation Program – Private Lands
• Sustainable Neighbourhood Retrofit Action Plan Program
• Stewardship Partnership Services
• Conservation Youth Corps
• Eco-Schools Expansion Program
• West Humber Stewardship Program
• Etobicoke-Mimico Stewardship Program
• Etobicoke Headwaters Subwatershed Regeneration

For the emissions reductions, the calculation was based on an estimate of the emissions savings achieved in 2024 from actions taken in 2024. For sequestration capacity, tree and shrub planting activities for the current year (2024) are used to estimate the average annual sequestration expected in future years, with current year sequestration capacity calculated based on plantings in prior years.

3.0 Explanation of the rating

Each year, the GHG emissions reductions reflect a mixture of different actions depending on the priorities of the participating organizations. As a result, the magnitude of emissions reductions will vary depending on the types of actions that are taken. In all cases, standard industry practices and associated published emissions factors are used.

- 3,413 tonnes of CO2e emissions were reduced through building, solid waste and industrial process retrofit projects in 2024.

- 547 tonnes of CO2e sequestration capacity was added in Peel Region in 2024. (Sequestration capacity refers to the amount of emissions that are able to be captured and stored through tree, shrub and seedling plantings.)

- Cumulative annual sequestration capacity reached 1,807 tonnes of CO2e due to planting efforts executed in 2021, 2022, 2023 and 2024.
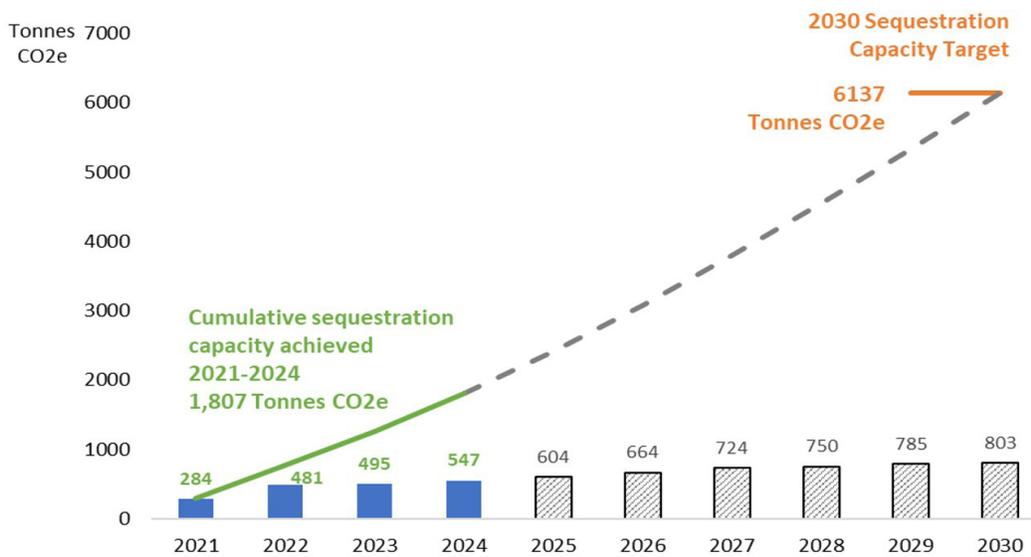

Figure 2: Achieved and projected CO2e sequestration capacity by year.

Note: A small discrepancy occurred in last year's reporting when the original data was graphed. The error was not significant and has been corrected in the current reporting.