

Section III – Items for the Information of the Board

TO: Chair and Members of the Board of Directors
Friday, March 21, 2025 Meeting

FROM: Sameer Dhalla, Director, Development and Engineering Services

**RE: SHORT- AND LONG-TERM ACTIONS FOR FLOOD
VULNERABLE AREAS IMPACTED BY 2024 STORMS**

KEY ISSUE

Summary of continuous review and improvement of Toronto and Region Conservation Authority's (TRCA) Flood Risk Management program by outlining the immediate term, short-term and long-term actions in Flood Vulnerable Areas impacted by the July 16, August 17, and August 18, 2024 storm events.

RECOMMENDATION:

IT IS RECOMMENDED THAT the report on Short- and Long-Term Actions for Flood Vulnerable Areas impacted by 2024 Storms, be received.

BACKGROUND

At Board of Directors Meeting held on September 27, 2024, Resolution #A 115/24 was approved as follows:

THAT staff, in consultation with municipal and agency partners, be directed to report back at the next available meeting on available options and associated funding estimates for enhanced and updated weather alert notification applications and communication strategies;

AND THAT staff be directed to report back at the next available meeting with a report on what actions can be taken in the immediate term, short term and long term for Flood Vulnerable Areas impacted by the July 16, August 17, and August 18, 2024 storm events.

AND THAT TRCA Engineering Services staff review the TRCA Hydrometrics program to identify potential improvements.

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AND THAT TRCA retain the services of a consultant to undertake a post-storm event analysis report.

At the Board of Directors Meeting held on October 25, 2024 (RES.#A139/24), the following recommendation was addressed:

THAT staff, in consultation with municipal and agency partners, be directed to report back at the next available meeting on available options and associated funding estimates for enhanced and updated weather alert notification applications and communication strategies...

This report addresses the remaining recommendations of Resolution #A 115/24 from the Board of Directors Meeting held on September 27, 2024, which are listed as follows:

AND THAT staff be directed to report back at the next available meeting with a report on what actions can be taken in the immediate term, short term and long term for Flood Vulnerable Areas impacted by the July 16, August 17, and August 18, 2024 storm events.

AND THAT TRCA Engineering Services staff review the TRCA Hydrometrics program to identify potential improvements.

AND THAT TRCA retain the services of a consultant to undertake a post-storm event analysis report.

RATIONALE

TRCA continues to advance flood risk reduction in accordance with its legislative responsibilities and the needs of its municipal partners. The significant storms of 2024 provided an opportunity to highlight and focus on these efforts and this report discusses flood risk management efforts within the impacted Etobicoke Creek, Don River, and Mimico Creek watershed flood vulnerable clusters; describes the scope of works for TRCA's Hydrometric Program review; describes the scope of works associated with the analysis and documentation of the 2024 storm events; and provides an update on the communications activities undertaken in Q4 2024.

Planned and Underway Actions by Watershed

The following describes the immediate-, short-, and long-term actions being taken within 5 of the TRCA's 41 flood vulnerable clusters, with the discussion of these areas grouped by watershed.

Etobicoke Creek Watershed Actions

Within the Etobicoke Creek watershed, the storms of 2024 primarily impacted Dixie Dundas and Little Etobicoke Creek flood vulnerable clusters. An illustration of these flood vulnerable clusters is provided as Attachment 1: Etobicoke Creek Watershed Flood Vulnerable Clusters Impacted by the July 16 and August 17 Flood Events.

The Dixie Dundas flood vulnerable cluster is located in the City of Mississauga (Ward 3) near to Little Etobicoke Creek, the cluster is centered at the intersection of Dixie Road and Dundas Street East, is ranked as 3rd riskiest of TRCA's flood vulnerable clusters and coincides with a provincially designated Special Policy Area (SPA). The urbanized nature of the Little Etobicoke Creek watershed makes this cluster susceptible to flooding from intense summer thunderstorms. This cluster experienced significant flooding during the July 8, 2013, July 16, 2024, and August 17, 2024 storms, when flows overtopped the Little Etobicoke Creek engineered channel and began flowing south along Queen Frederica Drive.

TRCA has completed several flood modelling projects in the Dixie Dundas area to define flood risk, including the development of a 2D hydraulic model which significantly increased our understanding of community flood risk. In June 2024, the City of Mississauga subsequently completed the Dixie-Dundas Flood Mitigation Project Municipal Class Environmental Assessment which established a comprehensive flood protection plan to achieve flood control to a Regional Storm (Hurricane Hazel) level of service. The City of Mississauga has committed over \$72 million to implement the proposed flood protection plan and is currently assessing further Federal and Provincial funding programs to help support the implementation phase of the project.

The Little Etobicoke Creek flood vulnerable cluster is located in the City of Mississauga (Ward 3), is ranked 33rd riskiest of TRCA's flood vulnerable clusters, and includes the floodplain of Little Etobicoke Creek between Eglinton Avenue and Burnhamthorpe Road. The Little Etobicoke Creek watershed has flooded and experienced erosion concerns as far back as the 1970s. Following channel alterations which resulted in frequent and severe flooding and evacuations of a nearby nursing home in the 1980s, TRCA undertook construction of the Tyndall flood wall to decrease flood risk at the nursing home. Except for the original Tyndall Retirement and

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Nursing Home, the majority of riverine flood impacts in this flood vulnerable cluster are seen at the Regional Storm (Hurricane Hazel) level.

The following outlines the actions within the above noted Etobicoke Creek Watershed flood vulnerable clusters.

Immediate Actions (2024 – 2025):

- Dixie-Dundas Road Crossing & Channel Widening Infrastructure Improvements: TRCA is planning to develop and enter into a service level agreement with the City of Mississauga to provide technical and design support for the City's detailed design phase activities. Following the lead of the City, TRCA will assist with the development of a terms of reference, scope of work, and the procurement of consultant services to undertake the detailed design process.
- Dixie-Dundas Road Crossing & Channel Widening Infrastructure Improvements: TRCA will work with the City to pursue funding opportunities from provincial and federal levels of government to offset project costs.
- Little Etobicoke Creek Riverine Flooding Review: TRCA will provide technical and design support to the City for the Riverine Flooding Review project which was approved at the City's September 25, 2024, Council Meeting.
- TRCA will continue to communicate risks to residents and businesses by increasing subscriptions to alert services and other measures outlined in later sections of this report.

Short Term Actions (2025 – 2028):

- Dixie-Dundas Road Crossing & Channel Widening Infrastructure Improvements: TRCA will provide technical support for the implementation phases of the flood protection plan, which the City of Mississauga has scheduled for completion in 2028.

Long Term Actions (2028– 2032):

- Dixie-Dundas Road Crossing & Channel Widening Infrastructure Improvements: TRCA will undertake a comprehensive flood plain mapping update following the infrastructure implementation phase and will work closely with the City of Mississauga to modify the Dixie-Dundas Special Policy Area Update.

Don River Watershed Areas

Within the Don River watershed, the storms of 2024 primarily impacted the Lower Don and Brickworks flood vulnerable clusters. An illustration of these flood vulnerable clusters is provided as Attachment 2: Don River Watershed Flood Vulnerable Clusters Impacted by the July 16 and August 17 Flood Events.

The Lower Don flood vulnerable cluster is located within the City of Toronto (Toronto Center/Toronto-Danforth) along the Lower Don River from Dundas Street East southerly to the Mouth of the Don River and is ranked as 8th riskiest of TRCA's flood vulnerable clusters. While most of this cluster does not see flooding except under very extreme events, the key transportation route (Don Valley Parkway) floods frequently as a result of thunderstorms, heavy rainstorms, rain on snowstorms, ice-jams within the Keating Channel and due to its low-lying location and proximity to the Don River. Larger extreme rainfall events also result in overtopping the channel and in significant spills to the east and south into the Port Lands.

The Don Mouth Naturalization and Port Lands Flood Protection Project is currently being implemented to remove riverine flood risk from ~250 ha of urban area in the Lower Don flood vulnerable cluster. In addition, the Broadview and Eastern Municipal Class Environmental Assessment which recommended a flood protection solution for approximately 8 ha of lands located between Eastern Ave. and the Metrolinx tracks is being advanced collectively by Waterfront Toronto, the City of Toronto, and TRCA. Once implemented, these works will provide flood protection to the Regional Storm (Hurricane Hazel) level of service. It is important to note that these works will not protect the Don Valley Parkway from continued flooding as the Don Valley Parkway is situated on the riverine side of the flood protection works.

The Brickworks flood vulnerable cluster is located within the City of Toronto (University-Rosedale) upstream of the Lower Don flood vulnerable cluster and encompasses the Evergreen Brickworks site, which is a low-point along the Bayview extension and the rail tracks serving the Richmond Hill GO route. The Evergreen Brickworks site is located in the floodplain of the Don River and could see flooding as frequently as with the 10-year storm. The Brickworks flood vulnerable cluster is ranked as the 11th riskiest of TRCA's flood vulnerable clusters. Several flood management techniques have been employed within this flood vulnerable cluster including property

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level flood risk reduction measures within the Evergreen Brickworks facility, a specialized flooding alerting system on the Metrolinx rail line, and the use of automated gates along the Bayview extension to accelerate emergency road closures.

Immediate Actions (2024 – 2025):

- Don Mouth Naturalization and Port Lands Flood Protection Project: TRCA will continue supporting the implementation phase of this project including supporting Waterfront Toronto's efforts to complete the detailed design of the Broadview and Eastern Flood Protection Landform.
- Don Mouth Naturalization and Port Lands Flood Protection Project: TRCA will continue to advance dredging activities in the Lower Don River and the Keating Channel to maximize available flow conveyance capacity.
- Emergency Response Improvements: TRCA will support the City of Toronto (Transportation Services) and the Ministry of Transportation in its efforts to more quickly close the Don Valley Parkway and associated roads in response to flooding forecasting provided by the TRCA.
- TRCA will continue to communicate risks to residents and businesses by increasing subscriptions to alert services and other measures outlined in later sections of this report.

Short and Long Term Actions (2025 – 2030):

- Don Mouth Naturalization and Port Lands Flood Protection Project: TRCA will continue supporting the implementation phases of the Don Mouth Naturalization and Port Lands Flood Protection Project and the Broadview and Eastern Flood Protection Landform.
- TRCA will support the City and Waterfront Toronto in the efforts to reduce the Lower Don Special Policy Area Update, through the provision of project management and specialized modelling services.

Mimico Creek Watershed Areas

Within the Mimico Creek watershed, the storms of 2024 primarily impacted the Malton flood vulnerable cluster. An illustration of the Malton flood vulnerable cluster is provided as Attachment 3: Mimico Creek Watershed Flood Vulnerable Clusters Impacted by the July 16 and August 17 Flood

Events.

The Malton flood vulnerable cluster is located in the City of Mississauga (Ward 5) on Mimico Creek north of Derry Road and is ranked as the 22nd riskiest of TRCA's flood vulnerable clusters. The residential community of Malton experienced significant urban flooding during the July 8, 2013, and July 16, 2024 storm events.

The Malton Channel was constructed upstream of Airport Rd in 1972 to prevent flooding of commercial and residential developments within the floodplain. In 2016, TRCA initiated and completed a 450 m channel clean out program intended to re-establish the channel's conveyance capacity which had been limited due to the presence of accumulated sediment and the presence of vegetation along the channel side slopes. In the fall of 2024, TRCA initiated a preventative maintenance channel clean out program of approximately 350 m of channel and will complete the remaining 100 m of channel cleanout in 2025. These cleanout works had been scheduled prior to 2024 as part of TRCA's annual flood control channel cleanout program. The channel did not overtop during the 2024 storms, but the adjacent community did experience significant urban flooding.

In 2018, TRCA, in collaboration with the City of Mississauga and the Region of Peel, completed the Malton Flood Characterization study. This study consisted of detailed hydraulic and hydrologic modelling, urban and riverine flood risk characterization, and recommendations for further flood protection works and flood remediation plan studies. Subsequently, and as recommended by the Malton Flood Characterization study, the City of Mississauga has completed a Municipal Class Environmental Assessment Study entitled, "Malton Flood Mitigation Study Etude Drive to Justine Drive". This EA study recommended an urban flooding infrastructure solution that is currently proceeding to detailed design. In addition, at the City's September 25, 2024, Council meeting, the City has committed to undertaking the construction of storm sewer upgrades for the Historic Malton Village with implementation in 2025.

Immediate Actions (2024 – 2025):

- Malton Channel Cleanout Program: TRCA will complete the remaining phases of the Malton Channel Cleanout Program by the end of Q4 2025;

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- City of Mississauga Infrastructure Upgrades: TRCA will provide design support for the Etude Drive to Justine Drive flood protection project and the Storm Sewer Upgrades in the Historic Malton Village; and
- Stream Flow Monitoring: TRCA will investigate the feasibility of installing a real-time stream gauge near the Mimico-Malton Flood Control Channel to enhance early warning capability.

Short Term Actions (2025 – 2028):

- Mimico Creek Hydrology Update: TRCA will assess and apply for available funding opportunities to undertake a comprehensive hydrology update for the Mimico Creek watershed. Dependent upon funding availability, TRCA will retain the services of a consulting firm to complete the hydrology update; and

Long Term Actions (2028– 2030):

- Mimico Creek Floodplain Mapping Update: TRCA will assess and apply for funding opportunities to undertake a comprehensive flood plain mapping update. Dependent upon funding availability, TRCA will retain the services of a consulting firm to complete the flood plain mapping updates.

Hydrometric Program Report

Hydrometrics measures the movement of water through the environment, and TRCA's program focuses on the measurement of stream flow and precipitation. Since 2006, TRCA has operated a Hydrometric Program to support core functions and deliverables including:

- Flood Forecasting and Warning: Real-time data collection and monitoring of stream and precipitation gauges allows early warning of flooding conditions and the remote monitoring of conditions during emergencies;
- Flood Plain Mapping: Hydrometric Program data is used to calibrate and validate hydrologic and hydraulic modelling ensuring the accurate determination of flood plain extents. Trend and risk analysis is possible where a sufficient length of measurement exists;
- Infrastructure Design: Hydrometric Program data is regularly collected and used by municipalities and engineering consultants to

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accurately design storm sewers, roads, bridges, buildings, and other types of municipal infrastructure; and

- Watershed Planning. Hydrometric Program data is used to understand watershed and climate changes across time. Collected data supports land-use planning efforts, can be used in risk analyses, can be used to guide infrastructure design decisions, aids with the protection of surface and underground water resources, and aids in the development of watershed planning and impact studies.

TRCA's Hydrometric Program has expanded steadily over the past 20 years in response to a variety of needs, weather events, and technological changes. Most importantly, the program has expanded to maximize TRCA's ability to improve modelling and forecasting abilities and to remotely monitor conditions during flooding events. TRCA's Hydrometric Program is a required activity that supports the development and implementation of authority programs and services as per section 21(1) of the Conservation Authority Act.

TRCA's Hydrometric Program consists of the components, as described in the following table.

Gauge Type	Total
Real-Time Stream Gauge	25
Real-Time Precipitation Gauge	30
Remote Stream Gauge	27
Remote Precipitation Gauge	10
Snow Measurement Course	10
Climate Station (temperature, wind speed, wind direction, humidity, solid moisture, etc.)	7

Increasing the density of precipitation gauges improves ability to provide advance warning of flood events and of the accuracy of flood forecasting. Increasing the number of stream gauges allows for increased awareness of changing river conditions which is useful for emergency services providers during flooding events. Increasing the size and extent of the monitoring network also increases program costs thereby requiring thoughtful consideration in the distribution of gauges across the TRCA watersheds.

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The ability to rely on collected data is a critical element of the TRCA's program. Collected data is used to set floodplain limits which can impact land use and emergency management planning, to inform level of service decisions which can influence infrastructure costs, to allow reliable expert advice to be provided by TRCA staff. The hydrometric program invests considerably in the operation and maintenance of the network and in the technologies employed to ensure compliance with federal standards for data collection and use.

In 2025, TRCA will be bringing the Hydrometric Program Review Report to TRCA Board of Directors. The purpose of the Hydrometric Program Review Report is to inform partners of the capability of TRCA's existing network of gauges and stations, and to determine what improvements can be implemented to best serve the needs of the TRCA and its partners. The report will begin with a background section to describe the program's gauge network, and the standards and procedures used by the TRCA to ensure the reliability of collected data. Following the background review, the report will provide a monitoring location review for the areas impacted by the significant storm events of 2024. This review will determine if more gauges are needed or if gauge locations should be adjusted, will identify potential data collection collaborations with other levels of government and/or municipal partners, and will describe funding impacts of any identified changes.

The hydrometric review is proceeding through the use of internal resources and will utilize previously prepared reports. The hydrometric review is expected to be completed by the end of 2025 and will be reported to the TRCA Board of Directors once completed.

Storm Event Analysis Report

A storm event analysis report serves to provide a public record of a significant storm events to aid in engineering and scientific analyses and to aid in emergency and infrastructure planning. Following the September 27, 2024, TRCA Board of Directors meeting, staff have been advancing the development a storm event analysis report to describe the events of both July 16 and August 17/18 within TRCA's jurisdiction. This section describes the actions taken since September 2024 and the planned works.

In the fall of 2024, several consultations took place with our municipal partners, namely the City of Mississauga and the City of Toronto, to establish the scope of works for the 2024 Storm Event Analysis Report.

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The scope of works includes the following elements.

- A storm event return period characterization to describe how the significant storms of 2024 compared with the 100-year design storm event and Hurricane Hazel definitions;
- A flood event return period characterization to undertake a flood frequency and hydrologic analysis that can account for the effect of compounding risks. This effort serves to understand how the preceding weather conditions influenced the severity of the flooding events;
- An Intensity Duration Frequency Curve analysis (IDF) to quantify the effect of the storms of 2024 on the existing definitions for a 100-year storm event (e.g. Is a 100-year storm still a 100-year storm?). This analysis would comment on the influence of these storm events on existing municipal and regional IDF definitions, and the recommendation of a process for more frequent IDF updates;
- A meteorological assessment to understand the conditions that led to such significant rainfall occurring. This assessment would include a characterization of the local climate within this pocket of TRCA's jurisdiction which has experienced more events that exceeded the 100-year storm within the last 11 years than other areas within the TRCA jurisdiction; and
- The inclusion of detailed storm event data to allow easy access for use in floodplain modelling and infrastructure design, for the purposes of increasing consistency across the TRCA jurisdiction, with the report being available for public use.

In parallel with the efforts to establish a scope of works, efforts have been underway to secure funding to offset the costs of completing the planned storm event analysis report. On October 10, 2024, a funding application was submitted to the Flood Hazard Identification Mapping Program (FHIMP) which is a federal funding program intended to support the development of flood models and flood plain mapping across the country. The FHIMP program can provide up to 50% in matching funds towards eligible projects. On December 5, 2024, TRCA learned that this funding application was successful, with the FHIMP program committing \$226,000 in matching funds to the TRCA.

Moving forward, the anticipated project timelines are as follows:

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Q1 2025

- Procure the services of an external consulting firm, through a competitive RFP process, to undertake the completion of the 2024 Storm Event Analysis Report; and
- Initiate a kick-off meeting with the successful consulting firm to confirm project scope, objectives, and expectations.

Q2 2025

- Complete the background review and data gap analysis stage of the project;
- Undertake a general storm overview analysis and initiate detailed analyses; and
- Initiate the meteorological assessment.

Q3 2025

- Complete the detailed storm event analyses, including flood model validation and storm event comparisons;
- Complete the meteorological assessment; and
- Develop recommendations and next steps for TRCA consideration.

Q4 2025

- Finalize the storm event and meteorological assessments and documentation of analyses and findings; and
- Communicate project results to TRCA's Board of Directors and publish report on TRCA's website.

Recent Communications Activities

Progress has been made on the requested flood communications program enhancements, and this section highlights the recent accomplishments.

A digital media campaign was undertaken to increase subscriptions to TRCA's Flood Message notification system using social media and Google Ads. This campaign was initiated in late December and ran for two weeks. This campaign will be repeated again in Q2 2025 when warmer weather conditions begin.

Efforts to expand TRCA's flood message notifications through the publication of messaging on municipal websites is underway. The intent is to duplicate the flood banner messaging that is employed on the TRCA website, on municipal websites. Requests were sent to municipal and agency partners in early December 2024. Rouge National Urban Park has

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already added a flood message link on their website, and discussions have been initiated with seven municipalities including those of the City of Mississauga, City of Pickering, City of Toronto, Town of Stouffville, Region of Peel, City of Vaughan, and City of Richmond Hill.

Efforts to raise awareness using elected officials' communication channels is an opportunity and draft communication are planned to be distributed to all elected municipal council representatives within TRCA's jurisdiction in early March 2025. These materials will include pre-written social media content for easy sharing and educational resources on emergency management and preparedness. Opportunities to share materials with community members, such as at public meetings, to promote TRCA's flood message notification systems continue to be sought. A sample of these planned communications can be found as Attachment 4: Spring Elected Officials Campaign Email Template, Attachment 5: TRCA Flood Message Types, and Attachment 6: Flood Risk Management Resources.

A Winter Safety Statement was issued by the TRCA on December 10, 2024 to address winter flood hazards and provide safety tips. A Spring Safety Statement is targeted for mid-March to warn residents of risk associated with springtime melt conditions.

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 2 Knowledge Economy:

- 2.4 Integrate environmental considerations and science into decision making

FINANCIAL DETAILS

Immediate, Short- and Long-Term Actions will be funded through several service level agreements with municipal partners, with staff time for planning and agreement execution supported through capital accounts 107-02 (Flood Protection and Remedial Capital Works) and 129-19 (Flood

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Remedial Works).

Funds to undertake the Storm Event Analysis Report will be tracked and communicated to the FHIMP with matching funds being available from capital accounts 107-02 (Flood Protection and Remedial Capital Works) and 129-19 (Flood Remedial Works).

Funds to support TRCA's Hydrometric Program Report are available in accounts 124-20 (Regional Monitoring Network – Stream and Precipitation) and 107-01 (Flood Forecasting and Warning System).

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Attachment 1: Etobicoke Creek Watershed Flood Vulnerable Clusters
Impacted by the July 16 and August 17 Flood Events

Attachment 2: Don River Watershed Flood Vulnerable Clusters Impacted
by the July 16 and August 17 Flood Events

Attachment 3: Mimico Creek Watershed Flood Vulnerable Clusters
Impacted by the July 16 and August 17 Flood Events

Attachment 4: Spring Elected Officials Campaign Email Template

Attachment 5: TRCA Flood Message Types

Attachment 6: Flood Risk Management Resources