



## **Communicating flood risk to residents living in riverine flood vulnerable areas**

Prepared by Rhianydd Phillips, Flood Emergency Management Coordinator,  
Rehana Rajabali, P.Eng., MUDS, Associate Director  
Development and Engineering Services

September 1, 2020

## TABLE OF CONTENTS

<b>Executive Summary</b> .....	3
Introduction.....	5
Objectives .....	6
Program Overview .....	7
Program Development .....	7
Municipal Partner Engagement.....	7
Industry Partner Engagement.....	8
Professional Facilitation.....	9
<b>Public Outreach Events and Materials</b> .....	11
Tactics for engagement .....	11
Public Flood Risk Maps .....	12
<b>Summary of Program Reach</b> .....	13
Outreach Approaches.....	13
<b>Challenges to effective outreach</b> .....	16
Multi-agency collaboration and reticence to discuss risk .....	16
Public reactions to risk communications .....	17
Lessons learned .....	18
Lessons learned from TRCA’s outreach initiatives are highlighted below: .....	18
1. Build on previous research .....	18
2. Leverage existing engagement opportunities .....	19
3. Get early buy-in from local elected officials .....	20
4. Leverage the expertise of local community representatives .....	20
5. Overcome reluctance to communicate risk by providing examples in other jurisdictions .....	20
6. Be flexible to partner approaches .....	21
7. Ensure appropriate representation at public events.....	22
8. Understand the different platforms for public engagement.....	23
9. Make critical information available .....	23
10. Design a visually pleasing digital presence, local to the user .....	24
11. Simplify technical information for public consumption .....	24
12. Use persuasive tones & make your advertising relatable .....	24

13. Utilize geo-targeted advertising .....25

14. Provide appropriate contact information for flood emergencies .....25

Conclusion .....25

Appendix A.....27

Appendix B.....28

Appendix C.....38

Appendix D .....1

## Executive Summary

The Toronto and Region Conservation Authority (TRCA) Flood Risk Public Awareness and Education Program was launched in 2018, supported by funding from the National Disaster Mitigation Program (NDMP), and included two broad program areas. First, to disseminate information on flood risk and current risk reduction initiatives to municipal partners, and second, to jointly deliver (together with municipal partners) risk information to flood vulnerable neighbourhoods via a combination of digital, print, and in-person campaigns. This document outlines TRCA's program approach and key takeaways for implementing a successful public engagement campaign.

The areas adjacent to a river or stream that flood frequently are called flood plains. Conservation authorities, like TRCA, map the extent of flooding in these areas to apply land-use and planning policies to prevent exposure to this risk. Historically, communities grew near rivers and streams to leverage the water or mechanical energy provided by them. As a result, there are many areas where development already exists within the flood plain. In these areas, the potential for flood damage is high. Areas in TRCA's jurisdiction where there is a high concentration of buildings at risk of flooding are termed Flood Vulnerable Clusters (FVCs). Many of these areas correspond to communities that were developed before land-use planning practices for natural hazard management. TRCA recently ranked the 41 FVCs through the [Flood Risk Assessment and Ranking \(FRAR\) study](#) and identified residents and businesses who live or work in the highest-ranked Flood Vulnerable Clusters as being target audiences for enhanced risk communications.

A successful awareness program should aim to reach the maximum possible number of residents in each target community to inform them of their risk as well as options for enhancing their personal preparedness. Using available channels of engagement is an important means of achieving this, along with providing an opportunity for face-to-face interaction through in-person engagement events. TRCA staff liaised with the local and regional Councillors in the target areas to communicate the intent and goal of the public outreach as well as invite them to attend and/or participate in the public events. This was done either through direct meetings or through presentations to council or committee meetings. Local elected officials were often in attendance and highly supportive of the events held. In addition to municipal partners, other agencies with active program areas in flood risk outreach were invited to participate in applicable open houses.

The format of in-person engagement varied with each cluster. Where existing public engagement events were already planned in the area by municipal partners or other TRCA departments, Flood Risk Management staff leveraged the existing event opportunity and attend the related event, by providing panels, takeaway materials, and the opportunity to answer questions. Where Flood Risk Management staff hosted dedicated public open houses, the format included informational panel displays with staff on-hand to answer questions, followed by a short presentation, and then a question and answer session. The two-hour events were run by the hired facilitator, to engage the audience as a neutral point of contact, to guide the question and answer sessions, and to collect qualitative feedback.

The uptake or attendance at any public event can be influenced by a variety of factors, ranging from the audience demographics to the weather, to the number of competing events and history of a prior engagement. While it is not possible to discern the causes of higher or lower attendance at the open-house events, higher attendance at TRCA-hosted events was observed for those public open houses in 1) areas that had recently experienced a major flood event, 2) areas where the direct-mail advertising was the most personal and visually engaging.

## Communicating flood risk to residents living in riverine flood vulnerable areas

A key observation from the discussions and questions fielded through this program was that most residents assume that flooding of any kind is not their responsibility. Residents do not naturally distinguish between different types of flooding and the corresponding roles and responsibilities. Customizing flood risk information tailored to each community, with points of reference specific to each neighbourhood, provides a better understanding of their personal risk. Thus, for an effective campaign, each neighbourhood might require a different approach depending on the community type. In all cases, the information presented must be meaningful, timely, and invoke a sense of urgency and personal responsibility, and must include visual representations of risk.

The key lessons learned from TRCA's outreach initiatives are characterized as follows:

1. Build on previous research
2. Leverage existing engagement opportunities
3. Get early buy-in from local elected officials
4. Leverage the expertise of local community representatives
5. Overcome reluctance to communicate risk by providing examples in other jurisdictions
6. Be flexible to partner approaches
7. Ensure appropriate representation at public events
8. Understand the different platforms for public engagement
9. Make critical information available
10. Design a visually pleasing digital presence, local to the user
11. Simplify technical information for public consumption
12. Use persuasive tones and make your advertising relatable
13. Utilize geo-targeted advertising
14. Provide appropriate contact information for flood emergencies

Further sections of this case study elaborate on each of these concepts.

The Flood Risk Public Awareness and Education Program was in its final stages when the new Ontario Flooding Strategy was released, which underscored the importance of increasing awareness as a method to reduce flood risk. Ensuring Ontarians are aware of flood risks is one of five overarching objectives within the strategy, and TRCA has exhibited leadership in this area through the delivery of the Flood Risk Awareness and Education Program. While the ability to undertake dedicated public open houses and door-to-door in-person campaigns will be limited in the absence of follow-up funding to the National Disaster Mitigation Program, education and outreach remain a key program area within the Flood Risk Management group. Broad-range activities in this realm are expected to continue in collaboration with municipal partners.

## INTRODUCTION

Many people inhabiting flood-prone communities are not fully aware of the risks to themselves and their property. A 2017 survey by the University of Waterloo found that only a small percentage of residents living in flood-prone areas are aware of their flood risk (Thistlethwaite et. al., 2017). Pro-actively communicating risks to vulnerable communities can lessen the impact of flooding on these areas, as residents can take preparatory steps to protect themselves and their homes. The comprehensive and sensitive delivery of risk communication, in advance of a flood emergency, can support effective crisis communications during a flood emergency. In this context, risk communication is meant to enable audiences to analyze, evaluate, and synthesize information that will be valuable in the face of a potential emergency. Crisis communication, by contrast, is meant to trigger audiences to remember known information, understand simple directions, and apply key actions to lessen the impact of the crisis. The flood messages issued by conservation authorities are an example of crisis communications. Pro-actively providing information to increase awareness in flood-prone neighbourhoods is an example of risk communications, which can prime these audiences to follow the protective actions outlined in the flood messages.

While Toronto and Region Conservation Authority (TRCA) has historically made flood plain information available to the public via general website content and partnerships with municipal emergency management activities, the inclusion of flood outreach activities as a method of non-structural flood risk reduction under the National Disaster Mitigation Program (NDMP) presented a unique opportunity for more targeted communication with residents and businesses in flood vulnerable neighbourhoods.

Recognizing the opportunity to leverage federal funding to undertake a dedicated flood risk outreach program, TRCA successfully secured funding in 2018 through the NDMP to actively reach out to flood vulnerable communities in TRCA's jurisdiction. Thus, the Flood Risk Public Awareness and Education Program was launched, which included two broad program areas. First, to disseminate information on flood risk and current initiatives in risk reduction to municipal partners, and second, to jointly deliver (together with municipal partners) risk information to flood vulnerable neighbourhoods via a combination of digital, print, and in-person campaigns. This document outlines TRCA efforts that were made to implement a successful public engagement campaign, supported by NDMP funding.



## Objectives

Floods can cause considerable damage to property and infrastructure, threaten human lives, and incur significant costs in emergency assistance, clean-up, and remediation. While there is often a reluctance to highlight existing flood risks to residents who may not be aware of them, providing information before a flood can allow residents and business owners to take protective actions. Transparency around risk information increases trust, builds relationships, and can provide the momentum to garner political support for the implementation of flood risk reduction projects.

The Flood Risk Public Awareness and Education Program targeted residents, businesses and institutions living and working in select flood vulnerable clusters, and was designed to:

- Reach the maximum possible number of residents in each cluster to let them know they live in an area that is at risk of flooding.
- Translate technical information into easily understandable terms.
- Provide updates about flood risk and flood plain information, and direct residents towards resources that would be kept up-to-date.

The key messages that formed the basis of communications content included the following:

- Information on the possible flood hazards including short-term and potential long-term impacts.
- How individual preparedness can be achieved, and what actions can be taken during a flood emergency.
- The protective actions the public could be advised to take in a flood emergency (e.g. evacuations, road closures).
- The methods by which the public will be notified of a flood emergency and who to contact.
- Where and how to access additional information and advice about general emergency preparedness actions the public can take to prepare for all emergencies (e.g., emergency survival kit, public alerting).

Effective key messages should outline risk information, clarify roles and responsibilities, and provide targeted tips for enhancing flood preparedness.

## PROGRAM OVERVIEW

### Program Development

#### Municipal Partner Engagement

Effective engagement with the public necessitates effective engagement with municipal partners first. In June of 2019, Flood Risk Management staff undertook full-day workshops with staff from each of TRCA's partner upper, lower, and single-tier municipalities. Attendees included over 100 employees from diverse departments. These workshops provided an opportunity to share location specific information on Flood Vulnerable Clusters (FVC) within each respective municipality, to review previously established roles and responsibilities during flood events, and to form working groups and work plans for the delivery of the public outreach component.

TRCA presented an initial list of target clusters based on their risk ranking however, the final list of target clusters and the corresponding strategies, were developed through working group sessions or through subsequent communication with municipal partners, who identified their own priority areas and strategies. Where the outreach events were organized and hosted by the Flood Risk Management team, TRCA staff also liaised with the local and regional Councillors in the target areas to communicate the intent and goal of the public outreach as well as invite them to attend and/or participate in the public events. This was done either through direct meetings, presentations to council, or to committee meetings. Local elected officials were often in attendance and highly supportive of the events held.

Different municipal divisions were brought together to develop content, with each having expertise in a specific thematic area, as outlined in the table below:

<b>Municipal Division</b>	<b>Key content expertise</b>
Emergency Management Office	Convening other divisions; general emergency management communications and outreach
Fire and Emergency Services	Content development with respect to evacuations
Police	Content development with respect to evacuations
Communications	Review of communication materials, direct contact information such as 311 triaging
Stormwater/Wastewater	Urban (pluvial) flooding
Engineering	Mapping, mitigation, and remediation studies
Planning and Development	Planning policy, permit and regulation public inquires



## Communicating flood risk to residents living in riverine flood vulnerable areas



York Region Municipal Engagement Meeting at Black Creek Pioneer Village, June 2019.

### Industry Partner Engagement

In addition to municipal partners, other agencies with active program areas in flood risk outreach were invited to participate in applicable open houses. Agencies that attended TRCA hosted public events included the following:

- Electrical Safety Authority, Hydro One and Toronto Hydro, to provide information on post-flood recovery practices for household electric systems.
- Intact Centre on Climate Adaptation, to provide information on lot-level flood protection measures.
- Insurance Bureau of Canada, to field questions on insurance coverage options.

Each municipal partner's respective Emergency Management staff also attended, thus providing a 'one-stop-shop' for residents to inform themselves about various elements of flood risk.

## Communicating flood risk to residents living in riverine flood vulnerable areas



Staff from Hydro One's Business Continuity & Emergency Preparedness team and the Town of Caledon Mayor Allan Thompson.

### Professional Facilitation

As this was the first foray into public engagement with a primary focus on communicating risk, as opposed to the specifics of a project, TRCA hired a third-party facilitator for each of the public engagement sessions to provide a neutral, professional point of contact. The facilitator was also tasked with capturing the key points of the discussions and ensuring a record of the questions and answers was made available as a follow-up. Finally, the facilitator was charged with providing guidance to the Flood Risk Management team through to process so that each subsequent engagement event could capture lessons learned from the previous ones.

Dillon Consulting was selected as the facilitator following a publicly posted procurement process, which evaluated proponents based on their experience in communicating potentially sensitive material and public engagement relating to flood risk related projects.

Although many materials were already in development prior to engaging the facilitator, they provided important insight into final meeting materials, including panels and presentation slides, and hosted each of the public meetings, aiming to connect attendees with the relevant staff expertise made available at each event. A key piece of guidance from the facilitator, in light of the subject matter, was the recommendation to provide space and place for empathic listening. People who have the lived experience of a flood often want public servants to understand the tangible, individual impacts, as opposed to solely the desktop data.

## Communicating flood risk to residents living in riverine flood vulnerable areas



Merrilees Willemse, Associate from Dillon Consulting Limited, facilitating the question and answer period at the Whitchurch-Stouffville open house.

## Public Outreach Events and Materials

### Tactics for engagement

Where no public engagement opportunity already existed in the highest priority clusters, TRCA pursued active outreach, with methods that were jointly developed with municipal partners. These tactics comprised of the following:

Platforms	Type of product	Call to action / Key messages
<b>Advertisements</b>		
Direct Mail Campaigns	Letter or postcard, custom to the cluster and used to advertise the open house	<i>You live in an area that is at risk of flooding. What would you do if (local river or creek) overflowed and the water level in your neighbourhood started to rise?</i>  <i>Come to an open house information session about river flooding and how you can protect what is important to you.</i>
Community Centre Bulletin Boards	Generic posters	<i>Not to alarm you, but you may live in an area at risk for river flooding! We can help you become better prepared. Learn more (custom web landing page, follow us (social media) sign up for email alerts (TRCA flood messages).</i>
Geotargeted Social Media Campaigns	Facebook advertisements	<i>Not to alarm you, but you may live in an area at risk for river flooding! We can help you become better prepared. Are you prepared (link to custom landing page)?</i>
<b>Engagement Platforms</b>		
Public Open Houses	Panels Presentations FAQ's	The panels and presentations were structured based on suggestions from the hired meeting facilitator.  <i>What nature does, what we can do and what's next.</i>
Events and Fairs	Generic flood preparedness handouts Spin wheel game	Interactive game demonstrating how the probability/likelihood of storm events is independent  <i>Do you live in a flood plain? Use our tool to search your address.</i>
Door to Door Engagement	Employee safety poster	<i>This building is in a flood risk area. What employees need to know</i>  <i>Flooding Dos and don'ts (link to custom landing page)</i>
<b>Information Repository</b>		
Custom Landing Pages	Custom web pages developed for each priority cluster (a great place to store information)	Living in a flood vulnerable cluster: know your risks (review the flood risk maps), be prepared (Flood Preparedness Tips for Homeowners including who should I contact during a flood, stay informed (Sign up to receive to flood messages & additional resources).



### Public Flood Risk Maps

Maps can be an important tool for communicating risk. The 2018 report from Partners for Action entitled, *“Using Flood Maps for Community Flood Risk Communication”*<sup>1</sup> concluded that maps can be beneficial to build awareness of personal accountability in flood preparedness.

TRCA develops a variety of mapping products, stemming from the studies that are used to determine the flood plain, or flooding hazard limit, for the purposes of applying land-use and planning policies. A key component in discerning levels of risk within a community is understanding the likelihood of flooding at a given location. A specific format of mapping, which delineated the return period flows as annual exceedance probabilities, was developed.

Considerations for the format of the flood risk maps were gathered from TRCA’s municipal partners during the partnership engagement workshops in June via a questionnaire and workshop sessions. Although municipal partners expressed a desire to see flood depths on the map, the site-to-site variability of flood depths as well as the difficulty in simultaneously distinguishing between likelihood and depth led to a preference for showing likelihood but expressed as an annual chance of occurrence rather than as a return period. The colour palette was also specifically chosen so as not to conflict with flood warning message template colours or to give the impression of illustrating depth as opposed to likelihood.

An example of TRCA’s flood risk map is shown in **Appendix A**.



---

<sup>1</sup> Minano, A., and S. Peddle (2018). Using Flood Maps for Community Flood Risk Communication. Report prepared for Natural Resources Canada (NRCan-30006050733). Waterloo, Ontario: Partners for Action.

## Summary of Program Reach

### Outreach Approaches

Given the diversity of municipal partner approaches, as well as the unique demographics of each cluster, the engagement methods were tailored for each cluster, and are summarized in the table below.

Cluster Name (rank)	Municipality	Outreach strategy- in-person	Advertising strategy
Rockcliffe (1)	Toronto	Attendance at existing public event organized by local councillor	N/A
Oak Ridges/ Lake Wilcox (8)	Richmond Hill	Attendance at existing community event organized by Fire and Emergency Services	N/A
Woodbridge (21)	Vaughan	Attendance at existing community event – Woodbridge Fall Fair	Community Centre posters; geo-targeted social media campaign
Pickering Village (4)	Pickering/ Ajax	Attendance at existing Public Information Centre (PIC) related to flood infrastructure improvements	N/A – note that the PIC itself was advertised as part of the Environmental Assessment (EA) requirements
Jane-Wilson (2)	Toronto	Attendance at existing PIC for Basement Flooding Area 45 Master Plan and Black Creek Trunk Sewer Improvement Study	Geotargeted social-media campaign (PIC itself was advertised by the City of Toronto)
Bolton Core (5)	Caledon	Dedicated flood risk public open house	Hand-delivered invitation letters
Stouffville Centre (27)	Whitchurch-Stouffville	Dedicated flood risk public open house	Town recreation guide; geo-targeted social media campaign
Avondale /Spring Creek (6)	Brampton	Dedicated flood risk public open house	Hand-delivered lenticular postcards; geotargeted social media campaign
Vellore Woods (29)	Vaughan	Attendance at existing community event – Vaughan Winterfest	Community Centre posters
Dixie-Dundas (3)	Mississauga	Dedicated flood risk public open house	Mailed letter invites; geotargeted social media campaign
Markham Industrial / Don Mills Channel (10)	Markham	Dedicated flood risk door-to-door information campaign	Door-to-door delivery of employee safety poster

Where existing public engagement events were already planned in the area by municipal partners or other TRCA departments, Flood Risk Management staff leveraged the existing event opportunity and attended the related event, providing panels, takeaway materials, and the opportunity to answer questions. Where no

## Communicating flood risk to residents living in riverine flood vulnerable areas

public engagement opportunity already existed in the highest priority clusters, TRCA pursued active outreach, with methods that were jointly developed with municipal partners over the course of six months.

Where Flood Risk Management staff hosted dedicated public open houses, the format included informational panel displays with staff on-hand to answer questions, followed by a short presentation and then a question and answer session. The two-hour events were run by the hired facilitator, who engaged the audience as a neutral point of contact and guided the question and answer sessions and to collect qualitative feedback. Event summaries, panels, and presentation slides were posted to the landing pages (websites) to ensure continued access to the information for members who were not able to attend in-person. A variety of methods were used to advertise the open houses, including geo-targeted social media campaigns, community centre posters and print invitations whose format varied from formal letters to visually engaging postcards. Each of the print materials was equipped with links and QR codes to direct readers towards the online information; enabling data collection on campaign effectiveness by tracking how many website visits originated from each of these print campaigns. Overall traffic to the Flood Risk Management sections of TRCA's website was also tracked.

Examples of outreach approaches listed above are shown in **Appendix B**.

Over the course of a 10-month period, TRCA Flood Risk Management staff participated in events that had an attendance base of over 2,400 people combined and created campaigns that reached 50,000 people digitally, and almost 2,000 people by mail. From these, 3,100 people accessed the flood risk-specific landing webpages to learn more about their risk, and there were over 200 meaningful in-person conversations with residents and business owners living in TRCA's flood vulnerable clusters. Furthermore, the number of new public signups to receive TRCA flood forecasting and warning messages between January and March 2020 (the most active period of the campaign) was more than four times the average of new self-subscriptions in a given quarter. The uptake or attendance at any public event can be influenced by a variety of factors, ranging from the audience demographics to the weather, to the amount of competing events and history of a prior engagement. While it is not possible to discern the cause of higher or lower attendance at the open-house events, higher attendance among the TRCA-hosted open houses was correlated with 1) areas that had recently experienced a major flood event, 2) areas where the direct-mail advertising was the most personal and visually engaging.

While the attendance at in-person open houses on average corresponded to only 10% of the target audiences, the continued presence of the key information on the cluster-specific webpages will allow for growth, over time, in the proportion of residents and businesses that are aware of their flood risk.

Attendees at the dedicated open houses hosted by Flood Risk Management staff were given a simple survey to determine their prior risk knowledge as well as the degree to which the information presented was useful. Although approximately only 25% of attendees completed surveys, the facilitator hired by TRCA for these events also captured qualitative information on key themes.

From the survey, it was possible to glean that:

- Most respondents heard about the open house through TRCA's direct mail efforts.
- Most respondents (75%) now know what to do during a flood.
- Almost all attendees found the information presented to be useful.

From the qualitative observations provided by the facilitator, several themes emerged with respect to public perception around flood risk, as well as roles and responsibilities. Key themes included that:

## Communicating flood risk to residents living in riverine flood vulnerable areas

- Residents wanted to share their anecdotal experience of flood risks and have a desire to supplement the data gathered during real flood events with their 'eyes on the ground' information.
- Residents sought clarity on whom to call (TRCA, the municipality, or first responders) for flooding situations; residents did not see a distinction between urban or riverine flooding before attending the event.
- Many residents expressed concerns about debris removal and channel cleanups.
- Residents and business owners sought information on specific measures they could take on their own properties.
- Attendees were appreciative of the information being shared.

Survey results are shown in **appendix C**.



Stouffville Riverine Flood Risk Open House on January 20<sup>th</sup>, 2020



## Challenges to effective outreach

### Multi-agency collaboration and reticence to discuss risk

Effective flood risk communication requires continued effort among multiple stakeholders. A key action outlined in the Ontario Flooding Strategy is to increase access to flood-related information. Supporting cohesive information access across the many agencies that have a role to play in reducing flood risks requires co-ordination across organizational siloes. As an organization stemming from a systems-thinking approach, conservation authorities can be effective convenors to bring together various organizations however, *intra*-organizational agility and co-operation is an important requirement. The lead division for communicating risk differs at each municipality – in some cases, it was under the purview of emergency management divisions, in other cases, it was part of the corporate communications mandate.

There is also a varying appetite for sharing information related to an existing risk in cases where there is no public works project underway to remedy that risk. The reluctance to undertake flood risk awareness programming stems from a variety of internal and external factors, as outlined below:

<b>Internal factors</b>	<ul style="list-style-type: none"><li>● Lack of services &amp; funding to undertake outreach itself</li><li>● Concerns for areas where a flood remediation solution is not planned/budgeted</li><li>● Lack of clarity in roles and responsibilities between divisions for communicating about flood risk</li><li>● Competing priorities for public engagement on other matters</li></ul>
<b>External factors</b>	<ul style="list-style-type: none"><li>● Influence of recent flood events on outreach – not wanting to trigger emotional responses</li><li>● Perceived concerns over property value and/or insurance availability following risk disclosure</li></ul>

Although Municipalities and Regions have the primary responsibility in responding to flood emergencies, residents also play a role in protecting themselves and their property from flooding. The assumption of personal responsibility is hindered by the fact that many residents do not know they live in a flood plain, and consequently lack awareness of the actions they can take to reduce this risk.

### Public reactions to risk communications

The reactions to being presented with flood risk information varied between individuals of each community and greatly varied from community to community. Some interesting reactions, that can help shape how to better tailor communications materials, are detailed below.

- In a few cases, there was mistrust or misinterpretation of the flood plain mapping process: some residents disagreed with the areas displayed on the flood plain map, identifying flooding outside the mapped area (due to personal experience of living in the area). Clarifying the types of flooding that are considered and not considered is an important factor (TRCA flood plain maps look only at riverine flooding, not pluvial flooding, and do not incorporate debris jams, for example). On the flipside, disbelief that flooding reaching the flood plain extents could ever occur was also encountered, citing that such events had never occurred over the course of their tenure at the property in question.
- The public sometimes misinterprets risk information, resulting in either enhanced or reduced perceptions of risk. For example, even with the efforts to simplify flood risk maps, some residents still assumed a 100-year flood could not occur twice within 100 years. The concept behind return periods is often misunderstood.
- For non-owners, there were cases where tenants (residential and business owners) were not aware of their flood risk, and in some cases, landlords expressed reluctance to share risk information with tenants.
- Housing type had an impact on risk perception – high-rise residents were more casual about their concerns around flood risk; direct mail campaigns illustrating flooding to the ground-level of single-family residential homes were less impactful to them. Tailoring the message is encouraged, however it becomes costly to target materials for so many different demographic profiles, as each segment requires its own design, custom print runs, sectioned mail drop, and staff time. A balanced approach which is local to the neighbourhood (but does not segment within each neighbourhood) and which provides further tailored digital content, was used.
- Events where flooding had (relatively) recently occurred were far more tense and contentious conversations than at those events where risk information was being presented for the first time.

## LESSONS LEARNED

A key observation from the discussions and questions fielded through this program was that many residents assumed that flooding of any kind is not their responsibility. Residents do not naturally distinguish between different types of flooding and the corresponding roles and responsibilities. Customizing flood risk information tailored to each community, with points of reference specific to each neighbourhood, provides a better understanding of their personal risk. Thus, for an effective campaign, each neighbourhood might require a different approach depending on the community type. In all cases, the information presented must be meaningful, timely, and invoke a sense of urgency and personal responsibility, and must include visual representations of risk.

Lessons learned from TRCA's outreach initiatives are highlighted below:

### 1. Build on previous research

Building on previous research to determine key information gaps and best practices are fundamental to an effective communications strategy. Scoped pilot studies for specific topics can also be useful prior to undertake a large-scale public outreach program.

The communications relating to the G. Ross Lord Dam Emergency Preparedness Plan in the community of Hoggs Hollow in early 2018 acted as a pilot project/case study for risk communications. The objective of the meeting was to inform residents living downstream of the dam of the possible emergency actions that might be necessary for the (unlikely) event of a dam-related emergency. The engagement was intended as a form of risk communication to prime audiences who might someday be required to act upon directions provided in crisis communications. The meeting was hosted by TRCA, in partnership with the City of Toronto Office of Emergency Management and was advertised through the local councillor newsletter, residents association, and via direct flyer delivery. Over 70 people attended the meeting including residents and the local councillor. Several participants approached the team after the meeting to say how much they appreciated the high quality of the information and the ability to ask questions and hear directly from the staff. The success of the open house format and the receptive tone of the audience set the stage for future risk communication, targeting flood vulnerable communities.

In the spring of 2019, Partners for Action (P4A) hosted a workshop entitled "Communicating flood risk to Canadians: Understanding the challenges and developing best practices", to investigate how flood risk information could be better communicated. A varied group of subject matter experts were engaged to offer different perspectives, explore best practices, and generate principles for effective flood risk communication. TRCA utilized findings from this workshop to illustrate the need for targeted flood awareness programs. The final report titled "Awareness to action: effectively communicating flood risk to Canadians" outlined a series of research activities conducted by Partners for Action to promote flood risk awareness and actions to reduce vulnerability and build safer and more resilient communities across Canada, was released in 2020.

Other key publications that were consulted included:

- Moudrak, N.; Feltmate, B. 2019. Weathering the Storm: Developing a Canadian Standard for Flood-Resilient Existing Communities. Prepared for Standards Council of Canada and National Research Council of Canada. Intact Centre on Climate Adaptation, University of Waterloo.  
<https://www.intactcentreclimateadaptation.ca/wp-content/uploads/2019/01/Weathering-the-Storm.pdf>

## Communicating flood risk to residents living in riverine flood vulnerable areas

- Heldsinger, N., MacKinnon, J., & Peddle, S. (2018). A Community Guide to Flood Risk Communication: Promoting Personal Preparedness. Waterloo, Ontario: Partners for Action. [https://uwaterloo.ca/partners-for-action/sites/ca.partners-for-action/files/uploads/files/community\\_guide\\_to\\_flood\\_communication.pdf](https://uwaterloo.ca/partners-for-action/sites/ca.partners-for-action/files/uploads/files/community_guide_to_flood_communication.pdf)
- Minano, A., and S. Peddle (2018). Using Flood Maps for Community Flood Risk Communication. Report prepared for Natural Resources Canada (NRCan-30006050733). Waterloo, Ontario: Partners for Action. [https://uwaterloo.ca/partners-for-action/sites/ca.partners-for-action/files/uploads/files/using\\_flood\\_maps\\_for\\_community\\_flood\\_risk\\_communication\\_24jan18\\_fnl\\_3.pdf](https://uwaterloo.ca/partners-for-action/sites/ca.partners-for-action/files/uploads/files/using_flood_maps_for_community_flood_risk_communication_24jan18_fnl_3.pdf)

Agencies such as P4A recognize the importance of effective communications to advance flood resiliency in Canadian communities, especially at the individual property level. TRCA reached out to Partners for Action (P4A) in the early stages of the program to help develop a survey to measure overall resident flood awareness and preparedness at the open houses, that was provided to attendees.

It is the aim of this case study to share insights and lessons learned, with the aim of supporting other flood risk awareness initiatives across Canada and beyond.

An example of the outreach evaluation provided by P4A is shown in **Appendix C**. [Source](#).

## 2. Leverage existing engagement opportunities

If an existing public engagement event is occurring in a target area, it is efficient to leverage that event to deliver flood risk information, as the natural captive audience of that event can broaden the reach of the flood awareness campaign. It is important, however, to ensure that the target audience is primarily comprised of the same geographic area that is targeted for flood risk outreach. In addition to the efficiency of combining audiences, residents can experience enhanced customer service when multiple service areas (first responders, public works, water/wastewater design, communications, emergency management, etc.) are brought together. Events that already bring together multiple areas will have already overcome the logistical challenge of convening these various divisions.



### 3. Get early buy-in from local elected officials

Local elected officials can be an excellent conduit for two-way communications with the target community. Their perspective can ensure that the campaign addresses key issues in the neighbourhood. Early buy-in from local elected officials can help garner momentum for the project. In TRCA's experience, it is best to first engage with the individual Councillors office, and thereafter present to general or program committees at municipal councils in order to get broader support for the initiative and encourage replication of the campaign in other neighbourhoods. It can also be an opportunity for garnering political support, and subsequent funding support, for flood risk mitigation capital projects.

### 4. Leverage the expertise of local community representatives

Although flood risk awareness campaigns seek to inform audiences of content that is based more on physical studies as opposed to a participatory process, the perspective of groups that work in community engagement, as well as local community representatives and elected officials, can help to ensure targeted messaging. As public servants using a data-driven approach towards communicating risk, the input of these groups can help ensure that technical content is appropriately translated to non-technical audiences. In addition to receiving feedback from internal groups that work in community engagement, TRCA connected with the Regional Watershed Alliance as well as local Councillors in developing the content. In some areas, staff and officials who have frequent community contact served as a familiar face during door-to-door outings, which can be beneficial, though it must be ensured that these local representatives have the resources, capacity, and authority to perform those activities.

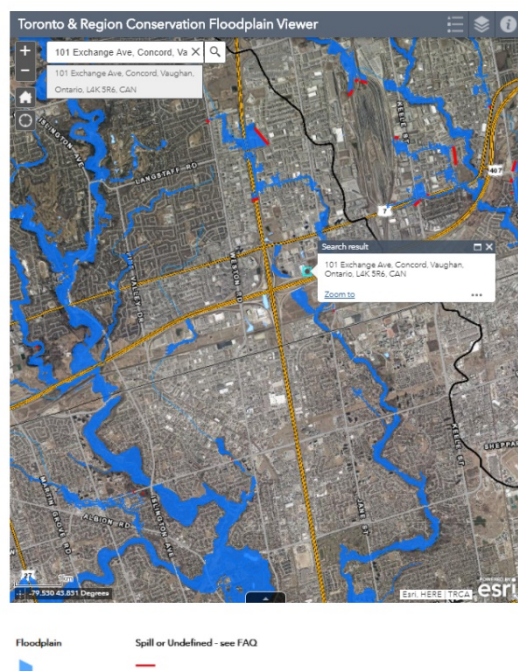
### 5. Overcome reluctance to communicate risk by providing examples in other jurisdictions

TRCA addressed concerns over risk disclosure with municipal partners at the outset of the project by providing examples to quell each of the specific concerns, including the following:

- To underscore that risk information eventually becomes available via other means, and how it is preferable to be at the forefront of information sharing, the example of the City of Edmonton was raised. In 2016, the City of Edmonton was forced by Postmedia's Freedom of Information request to disclose its pluvial flood risk maps. Making information more readily available at the outset provides local authorities with the opportunity to control the narrative, showcase transparency, and utilize the opportunity to underscore the need for personal preparedness.
- To illustrate how this type of information has been available in other products and how it has been helpful, staff provided the example of TRCA's flood plain map viewer, which was launched to the public in 2017. The information was placed on TRCA.ca with a disclaimer and a number of FAQ's. TRCA has not received any calls from concerned citizens or complaints regarding concerns over property value or the availability of this information, and it is one of TRCA's top viewed webpages. [TRCA.ca/Flood plainMap](https://trca.ca/Flood%20plainMap).

## Communicating flood risk to residents living in riverine flood vulnerable areas

### Flood Plain Map Viewer



TRCA's Flood plain map viewer available on [TRCA.ca/flood](https://trca.ca/flood)

Perhaps a local phenomenon to the GTA market, the topic of impacts to property value from risk disclosure did not arise through the public meetings. Staff were expecting questions about property value to arise, along with questions around the relationship between obtaining flood insurance and being in the floodplain. However, only one resident at the Spring Creek, Brampton open house asked the question about the implication of flood plain mapping on insurance. Because representatives from the Insurance Bureau of Canada were available, they fielded the question explaining that insurers each use their own models for pricing (versus the TRCA models which are built for land-use planning purposes), and that homeowners should investigate their options similarly to other insurance products.

## 6. Be flexible to partner approaches

Certain municipalities felt that the traditional public open house type event would not be effective, and that there were opportunities to engage with a large number of residents who naturally attended their local community events. While TRCA had previously utilized Emergency Preparedness Week fairs and similar events to share flood risk information, it was important to consider a variety of different approaches for the Flood Risk Public Education and Awareness program in order to glean insights into the relative effectiveness of these methods. The final outreach methods included seasonal fairs and festivals, fire house open houses, and door to door campaigns.

Fairs and festivals provided an opportunity to interact with a large number of residents, however when trying to engage with a very specific geography, it may prove difficult to reach the true target audience. For fairs attended during the outreach program, staff found that only 1-2% of attendees that they interacted with were residents of the target flood vulnerable clusters.



## 7. Ensure appropriate representation at public events

Flooding is a shared responsibility and involves expertise and response activities from multiple agencies. Furthermore, a typical homeowner does not know the difference between riverine flooding and overland flooding. They also do not know that these different types of flooding are managed by different agencies. To ensure the delivery of fulsome flood risk information, it is important to ensure representation from each responding agency and division, removing the onus from attendees to navigate the bureaucratic structure of each organization.

For instance:

- Conservation Authorities monitor for riverine flooding potential and inform responding agencies of those risks.
- Municipalities own and maintain municipal water systems as well as have the role to respond to flood evacuations, close roads, clear catch basins, etc.
- Individual homeowners are responsible for knowing their flood risks, protecting their home from flooding and having adequate flood insurance.

In summary, ensuring appropriate agency representation:

- Discourages over-messaging.
- Avoids confusion over roles and responsibilities during a flood.
- Presents a united display of partnerships between agencies.
- Helps avoid duplication of resources.
- Increases customer service standards.



City of Mississauga | Office of Emergency Management staff

## 8. Understand the different platforms for public engagement

A variety of event-specific logistic lessons were learned through the course of this program, as outlined below:

- For open houses, ensure partner agencies have a role to play in the open house so that their attendance is not moot. Make sure the room is large enough to accommodate the expected audience and the informational displays. Ensure that the facility has proper visual/audio and ensure that presentations are kept to a maximum of 30 minutes.
- For door to door campaigns, divide into teams of 2-3 people maximum to ensure that the campaign party does not overwhelm the receptionist, business owner, or resident.
- At fairs and festival events, remember that most people attending are not looking to spend a lot of time learning. Limit speaking points to the key relevant information. In the case of flood risk, ask the person if they live in a flood risk area. In TRCA's case, the flood plain map viewer was used to help identify if the person was located in the Regulatory flood plain to then customize a key message. If the person lived in the flood plain, key messages revolved around signing up for flood messages and directing them to resources regarding insurance and lot-level resilience measures. For people who did not live in the flood plain, messaging defaulted to general emergency preparedness points.

## 9. Make critical information available

As stated earlier, TRCA's flood plain map viewer has been available to the public since 2017, representing an accessible way for individuals to see where the flood plain is relative to their home or place of business. Ensuring that critical information is broadly shared, and that the principles of data transparency and openness are espoused early on enables future targeted outreach campaigns. Giving the ability for residents who are interested to undertake their own analysis avoids questions at public events pertaining to withholding information – it helps avoid the question of “*why wasn't I informed of my risk before?*” because the information was always available for those who were seeking it.

It is important to also clarify that the risk itself may occasionally change (for example with a changing climate or land-use changes), but much more frequently, our *understanding* of the risk is ever evolving. New tools and technologies in flood plain modelling and mapping mean that further data refinements can lead to new information. It is important to always advise recipients that data is evolving and may change from time to time. For example, TRCA included the data currency date and the following explanation in communications to municipal partners: *As modelling techniques continue to evolve and as new information continues to be gathered, the resulting updated flood plain mapping products can change the risk and damage calculations, as well as the ranking of flood vulnerable clusters in the future.*



## 10. Design a visually pleasing digital presence, local to the user

Arranging an online presence should be a key component to any modern communication strategy. Housing information online acts as repository to centralize flood resources that is local to the resident and acts as a tool to track the effectiveness of the information. Designing a visually pleasing digital presence, with local information for the user will allow for the continued provision of flood risk preparedness information to the community using the same platform. Compelling visuals and guided sections can help residents make sense of technical information.

An example of TRCA's digital landing page is shown in **Appendix E**.

## 11. Simplify technical information for public consumption

Design materials and maps for public consumption in mind. For example, the creation of a public-specific template for flood risk maps diverged from previous templates meant for technical audiences. The flood risk maps were simplified to include only the flood risk boundaries, buildings, nearby gauges, and the areas that had different likelihoods of flooding. While for technical audiences these were referred to by their return period (e.g. 2 year storm, 100 year storm), these were translated into percentages for the public audience because the concept behind return periods is often misunderstood.

For example, the phrase "100-year storm" refers to the storm that has a 1% (1 in 100) chance of occurring in any given year. It is termed the 100 year storm because the average recurrence interval is once for every 100 years, but in fact there is a 26% chance of seeing that flood at least once over a 30 year time-frame. While not likely, it is possible to see two 100-year storms even within the same year. It is incorrect to assume that a 100-year storm will not occur again for 100 years after it happens.

The colour palette was customized to ensure visibility and reduce confusion with the display of flood depth. For example, shades of blue were discouraged as it could be perceived to be illustrating greater depth, as opposed to differing likelihood. At the open houses, residents assumed that flood risk and flood plain maps were developed based on past flooding as opposed to synthetic hypothetical storms. Providing a clear explanation on the process of flood plain mapping is useful.

*For more information on the development of TRCA's flood risk maps, visit page 5. See Appendix A.*

## 12. Use persuasive tones & make your advertising relatable

The tone and language for effective messaging must be sensitive to the community type. Key messages, engagement formats, and even the timing of engagement might vary by community type (rural vs urban) and level of risk (landlords and homeowners vs tenants and condo owners). For communities that have recently experienced flooding, use an empathic tone, and provide space for residents to air their feelings, observations, and lived experiences. To awaken an over-messaged community that is unlikely to take time to consider flood risk messaging, a more visually appealing design and perilous tone can be useful in soliciting attention. Consider using quick response codes (QR codes) to help direct users to digital information easily.

An example of TRCA's advertising materials is shown in **Appendix B**.

### 13. Utilize geo-targeted advertising

Social media geo-targeted advertising is a way to restrict advertising audience to a certain geographic area. It is the best way to target specific areas using postal codes and helps avoid audience over-reach (i.e. TRCA was not attempting to reach residents who were not within the flood plain). Geotargeting can filter customers by zip code, city, or country. Social media can be used to promote in-person engagement opportunities but should also be used as a basis for online engagement in areas where no physical outreach is possible. Geo-targeted campaigns are also more cost-effective as many are provided on a pay-per-view basis, and viewership is targeted to specific locales only.

An example of TRCA's advertising materials is shown in **Appendix B**.

### 14. Provide appropriate contact information for flood emergencies

Knowing who to call during a flood emergency was highlighted as a key takeaway from the outreach program. Understanding and prioritizing who to call is also helpful in illustrating the roles and responsibilities of different parties when it comes to flooding.

Digital and print materials created for this campaign included variations of the following message, and it was often the concluding statement in the open house presentations (actual phone numbers were provided but are omitted below):

*Who Should I Contact During a Flood?*

- *If you are in danger or there is a threat to life and safety call 911 immediately.*
- *If you see any potential property damage, call your insurance representative as soon as possible.*
- *To report localized flooding on municipal roads, blocked catch basins, or municipal infrastructure, including basement flooding, contact your local municipality.*
- *To report river flooding leave a voicemail on the TRCA floodline.*
- *To report power outages or downed wires, call your local hydro provider.*

## CONCLUSION

Many residents are not aware of their flood risk, of the different flooding mechanisms, of the varying roles and responsibilities, or how best to respond when faced with flooding. Reaching flood-vulnerable communities by developing custom information tailored to them enables risk information to be more accessible and more personally relevant. Approaches might need to be tailored to each municipal context, and the type of information should be presented differently to individual community types. The information presented must be meaningful, timely, or invoke a sense of urgency and should be accompanied by a visual representation of the risk.

The Flood Risk Public Awareness and Education Program was in its final stages when the new Ontario Flooding Strategy was released, which underscored the importance of increasing awareness as a

## Communicating flood risk to residents living in riverine flood vulnerable areas

method to reduce flood risk. Ensuring Ontarians are aware of flood risks is one of five overarching objectives within the strategy, and TRCA has exhibited leadership in this realm through the delivery of the Flood Risk Awareness and Education Program. While the ability to undertake dedicated public open houses and door-to-door in-person campaigns will be limited in the absence of follow-up funding to the National Disaster Mitigation Program, education and outreach remain a key program area within the Flood Risk Management group at TRCA. Broad-range activities in this realm are expected to continue in collaboration with municipal partners.

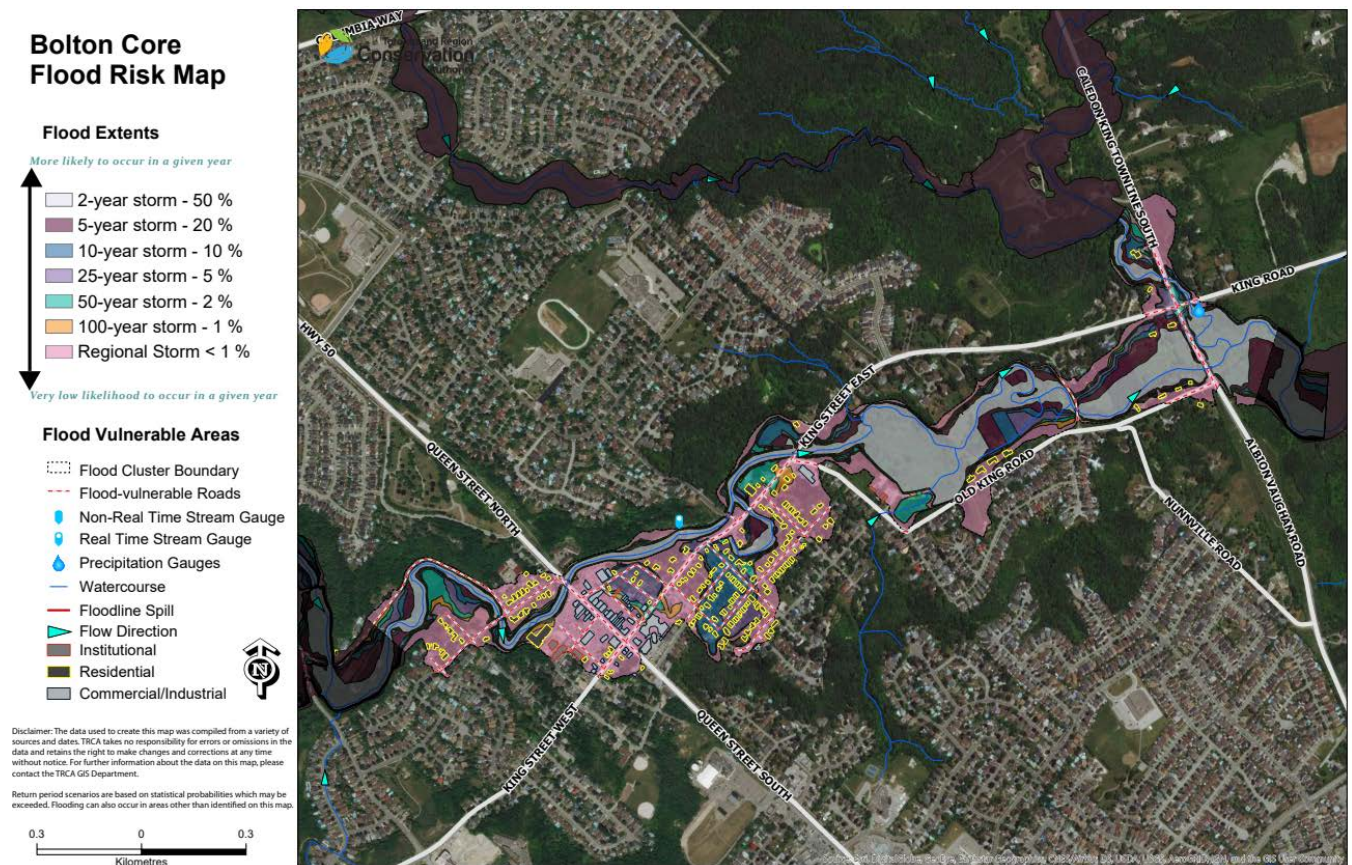
TRCA will continue the development of site-specific content for high-risk flood vulnerable clusters, with expanded information on remediation and infrastructure projects, as well as an overhaul of the main Flood Risk Management website to incorporate the key areas in which residents and business owners seek information, as informed through the Public Awareness and Education campaign. Objectives also include the development of informational videos as well as factsheets. Social media can continue to be utilized to address the key theme areas identified from the public open houses, such as clarity on roles and responsibilities during flood events. Further funding mechanisms that support outreach as a flood risk reduction activity can enable additional and continued engagement with flood vulnerable clusters.

For more information related to the Flood Risk Public Awareness and Education Program, please contact Rhianydd Phillips at [Rhianydd.phillips@trca.ca](mailto:Rhianydd.phillips@trca.ca).

Communicating flood risk to residents living in riverine flood vulnerable areas

## Appendix A

Example of TRCA's Public Flood Risk Map (example shows the Bolton core, in the Town of Caledon):





## Appendix B

Examples of TRCA's Outreach Materials.

Advertisements are listed below in order of direct mail pieces, community posters and social media graphics.

Town of Caledon: Bolton Open House Direct Mail Flyer



### **BOLTON CORE RIVERINE FLOODING OPEN HOUSE**

**January 7, 2020** | 6:30pm–8:30pm | Albion Bolton Community Centre  
150 Queen Street South, Bolton

Staff from Toronto and Region Conservation Authority (TRCA) will be on hand to address specific concerns about flooding in your area and to provide advice, resources and information to help you become better prepared in the event of flooding.

This event is open to all interested residents. You can register to attend at [trca.ca/flood-risk-bolton](https://trca.ca/flood-risk-bolton) or simply drop in.

---

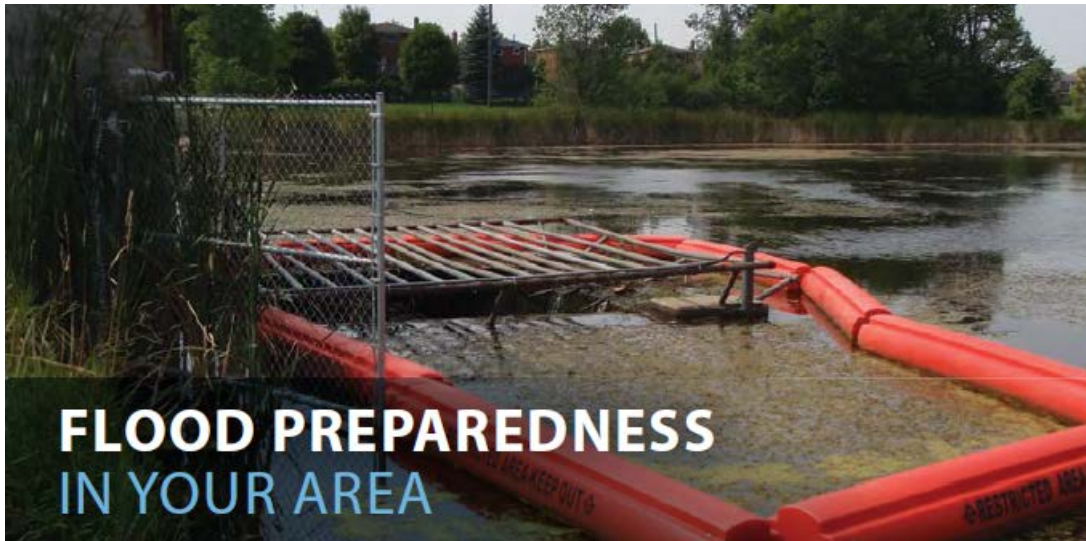
Learn more: [trca.ca/flood-risk-bolton](https://trca.ca/flood-risk-bolton) | Follow us: @TRCA\_flood  
Sign up to receive flood messages: [trca.ca/floodmessages](https://trca.ca/floodmessages)

---

*Supported by:*



Town of Whitchurch-Stouffville Open House Direct Mail Flyer



Toronto and Region Conservation Authority (TRCA) invites business owners and residents living/conducting business downstream from Stouffville Dam, along Stouffville Creek, to a public open house about the Dam Emergency Preparedness Plan and general flood readiness.

**STOUFFVILLE CENTRE  
RIVERINE FLOODING OPEN HOUSE**

**January 20, 2020 | 6:30pm – 8:30pm**  
Latham Hall - 8 Park Dr, Whitchurch-Stouffville

**AGENDA:**

**6:30 PM – 7:00 PM:** Open house with information panels and staff available to answer questions

**7:00 PM – 7:30 PM:** Presentations

**7:30 PM – 8:00 PM:** Q&A

**8:00 PM – 8:30 PM:** Open house with information panels and staff available to answer questions



This event is open to all interested parties. You can register to attend at [trca.ca/flood-risk-stouffville-centre](https://trca.ca/flood-risk-stouffville-centre) or simply drop in.

Learn more: [trca.ca/flood-risk-stouffville-centre](https://trca.ca/flood-risk-stouffville-centre) | Follow us: @TRCA\_flood  
Sign up to receive flood messages: [trca.ca/floodmessages](https://trca.ca/floodmessages)







With increased urbanization and severe weather events expected to happen more frequently, being prepared and understanding the risks to you, your family and property during river flooding is your best defense.

Come to a **free open house information session** about river flooding potential in Spring Creek and how you can protect what is important to you.

**SPRING CREEK RIVERINE FLOODING OPEN HOUSE**

January 30, 2020 | 6:30pm–8:30pm | Civic Centre -150 Central Park Dr.

Staff from Toronto and Region Conservation Authority (TRCA) and the City of Brampton will be on hand to address specific concerns about flooding in your area and to provide advice, resources and information to help you become better prepared in the event of flooding.

Share this information with your neighbours!

Can't make it? Find out more and how you can prepare:

- Visit our website at [trca.ca/flood](https://trca.ca/flood)
- Leave us a message at **416-661-6514**
- Follow us on Twitter @**TRCA\_Flood**
- Sign up to receive flood warning emails at [trca.ca/floodmessages](https://trca.ca/floodmessages)

This event is open to all interested residents. You can register to attend at [trca.ca/flood-risk-spring-creek](https://trca.ca/flood-risk-spring-creek) or simply drop in.



Supported by:



\*Artistic rendering. Actual flood levels may vary.

Lenticular printing is a technology in which lenticular lenses are used to produce printed images with an illusion of depth, or the ability to change or move as the image is viewed from different angles.





**NOT TO ALARM YOU, BUT YOUR HOME IS IN A FLOOD RISK AREA.**

**We can help you become better prepared.**



**DIXIE DUNDAS RIVERINE FLOODING OPEN HOUSE**  
**March 2, 2020 | 6:00pm – 8:00pm**

Fleetwood Room, Burnhamthorpe Community Centre  
1500 Gulleden Drive, Mississauga, ON L4X 2T7

This open house will focus on the types of flooding a homeowner could experience in this neighbourhood. Staff from Toronto and Region Conservation Authority (TRCA), the Region of Peel, and the City of Mississauga will be on hand to address specific concerns and to provide advice, resources and information to help you become better prepared in the event of flooding.

This event is open to all interested residents. You can register to attend at [trca.ca/flood-risk-dixie-dundas](https://trca.ca/flood-risk-dixie-dundas) or simply drop in.



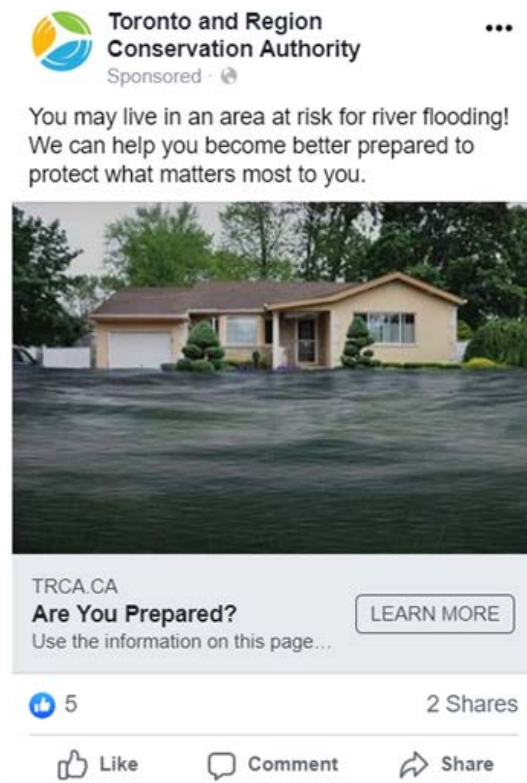
Learn more: [trca.ca/flood-risk-dixie-dundas](https://trca.ca/flood-risk-dixie-dundas) | Follow us: [@TRCA\\_flood](https://twitter.com/TRCA_flood)  
Sign up to receive flood messages: [trca.ca/floodmessages](https://trca.ca/floodmessages)

In collaboration with:



## Communicating flood risk to residents living in riverine flood vulnerable areas

### Geo-targeted Facebook Campaigns



In addition, TRCA and municipal social media profiles were used to advertise the open house.



## Communicating flood risk to residents living in riverine flood vulnerable areas

The open house materials were comprised of informational panels, presentation, flood preparedness handout, and a survey. Examples are listed below.

Informational panels

### TRCA'S FLOOD MESSAGES

To support our municipal partners during storm events, Toronto and Region Conservation Authority (TRCA) runs a **Flood Forecasting and Warning Program** with staff on-call, 24/7. If flooding is possible or about to occur, TRCA issues flood messages to designated individuals within municipalities, local agencies, school boards, the media, and members of the public who self-subscribe.



#### Sign Up for Flood Messages

To receive flood messages, you can either:

- Subscribe to email notices at [trca.ca/floodmessages](https://trca.ca/floodmessages)
- Follow us on Twitter at [@TRCA\\_Flood](https://twitter.com/TRCA_Flood)

Flood messages are also posted on TRCA's website at [trca.ca/floodforecasting](https://trca.ca/floodforecasting)



## Communicating flood risk to residents living in riverine flood vulnerable areas

### Presentation

The PowerPoint introduction slide for the Mississauga open House, displayed logos of the agencies available for residents to speak with at the open house.

<p>Learn about how you can be better prepared for flooding from industry professionals. Visit their booths for resources, advice and more!</p>  <p><b>Toronto and Region Conservation Authority</b></p> <p><small>Toronto and Region Conservation Authority</small></p>	 <p><b>MISSISSAUGA</b></p>
	 <p><b>Region of Peel</b> <i>Working for you</i></p> <p>1</p>

**INTACT CENTRE**  
ON CLIMATE ADAPTATION



**Electrical Safety Authority**

IBC  BAC





## Personal Flood Preparedness

When it comes to flood preparedness, everyone plays a role. There are many steps you can take to better prepare your family and your home in case of flood emergencies:

- 1 **Know the risks** – Be aware of what types of hazards might affect your home and what kinds of emergencies might impact your family.
- 2 **Make a plan** – Having a family emergency plan will save time and make real situations less stressful.
- 3 **Get a kit** – In an emergency, you will need some basic supplies and should be prepared to be self-sufficient for 72 hours.
- 4 **Talk to your insurance provider** – Overland flood insurance is not a standard offering on most policies, talk to your broker to confirm your coverage and options.
- 5 **Protect your home** – There may be steps you can take to make your property less vulnerable from flooding in general, such as installing backflow preventers and keeping valuables on higher floors.
- 6 **Stay informed** – Be aware of circumstances that could potentially lead to flooding.



## Resources

### **Municipal Flood Resources**

Check out the following to help better protect yourself and your home:

#### **Town of Caledon**

Emergency Preparedness

<https://www.caledon.ca/en/live/emergencyresponseplan.asp>

#### **Region of Peel**

During an Emergency: Flooding

<http://www.peelregion.ca/prep/bereadybeprep/during/specific/flooding.htm>

#### **TRCA Flood Risk Management**

Use the information on this page to help you understand and prepare for flooding if you live near Bolton in the Town of Caledon.

<https://trca.ca/flood-risk-bolton>

#### **TRCA Real-time Monitoring (gauges)**

[www.beta.trcagauging.ca](http://www.beta.trcagauging.ca)

#### **Ontario Office of the Fire Marshall and Emergency Management**

[www.emergencymanagementontario.ca/english/beprepared/beprepared.html](http://www.emergencymanagementontario.ca/english/beprepared/beprepared.html)

#### **Public Alerting in Ontario**

[www.emergencymanagementontario.ca/english/ontariowarnings/ontariowarnings.html](http://www.emergencymanagementontario.ca/english/ontariowarnings/ontariowarnings.html)

See also [www.alertready.ca](http://www.alertready.ca)

#### **Insurance Bureau of Canada**

<http://assets.ibc.ca/Documents/Brochures/A-Guide-to-Residential-Water-Damage-and-Flood-Insurance.pdf>

and [www.ibc.ca](http://www.ibc.ca)

#### **Flood Ready – Canada.ca**

[www.canada.ca/en/campaign/flood-ready.html](http://www.canada.ca/en/campaign/flood-ready.html)

#### **Electrical Safety Authority: Flood Safety Information**

<https://www.esasafe.com/consumers/safety-and-security/storm-safety/flood-safety-info>

#### **Intact Centre on Climate Adaptation: Flood Protection Resources**

[https://www.intactcentreclimateadaptation.ca/programs/home\\_flood\\_protect/resources/](https://www.intactcentreclimateadaptation.ca/programs/home_flood_protect/resources/)

#### **Institute for Catastrophic Loss Reduction: Protect Your Home from Basement Flooding**

<https://www.iclr.org/flooding/>

## Appendix C

### Survey example



#### Downtown Bolton Riverine Flooding Open House Participant Survey

##### How did you hear about this event?

- Social media
- Community Poster
- Flyer delivered to my home
- From a neighbour/community member

For the following statements, please select the response that most closely reflects your opinion.

##### 1) My home/or business is at risk of flooding?

- 1- Strongly agree
- 2- Agree
- 3- Neither agree nor disagree
- 4- Disagree
- 5- Strongly disagree

##### 2) I know where to find flood maps for the Town of Caledon, Bolton?

- 1- Strongly agree
- 2- Agree
- 3- Neither agree nor disagree
- 4- Disagree
- 5- Strongly disagree

##### 3) I know where to find flood information (messages, resources) for Bolton?

- 1- Strongly agree
- 2- Agree
- 3- Neither agree nor disagree
- 4- Disagree
- 5- Strongly disagree

##### 4) I now know what to do if my home or business is at risk of flooding?

- 1- Strongly agree
- 2- Agree
- 3- Neither agree nor disagree
- 4- Disagree
- 5- Strongly disagree

##### 5) During a flood, I know who to contact?

- 1- Strongly agree
- 2- Agree
- 3- Neither agree nor disagree
- 4- Disagree
- 5- Strongly disagree

##### 6) Did you find the information presented at the event helpful?

- 1- Agree
- 2- Disagree

##### 7) Do you have any feedback for us on how we could improve this information session?

---

---

---

---

---

---

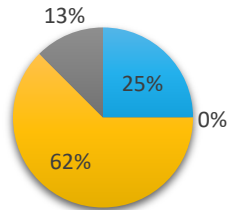
---

### Survey Results

#### Bolton Open House; Summary of Meeting Feedback Forms

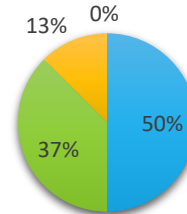
At the open house, feedback forms were provided to attendees to fill out. A copy is included in Appendix B. 8 completed forms were received. Overall feedback included:

### How did you hear about this event?



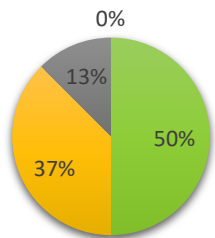
- Social media
- Community Poster
- Flyer delivered to my home
- From a neighbour/community member

### My home or business is at risk of flooding?



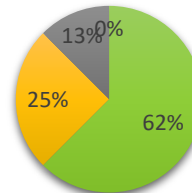
- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree

### I know where to find flood maps for the Town of Caledon?



- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree

### I know where to find flood information (messages, resources) for Bolton?

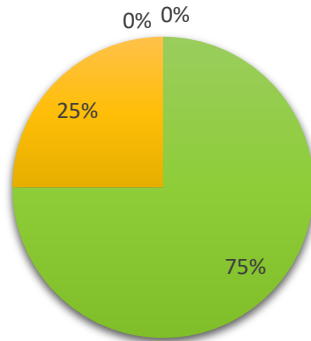


- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree

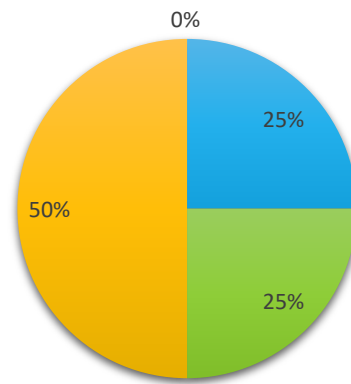


## Communicating flood risk to residents living in riverine flood vulnerable areas

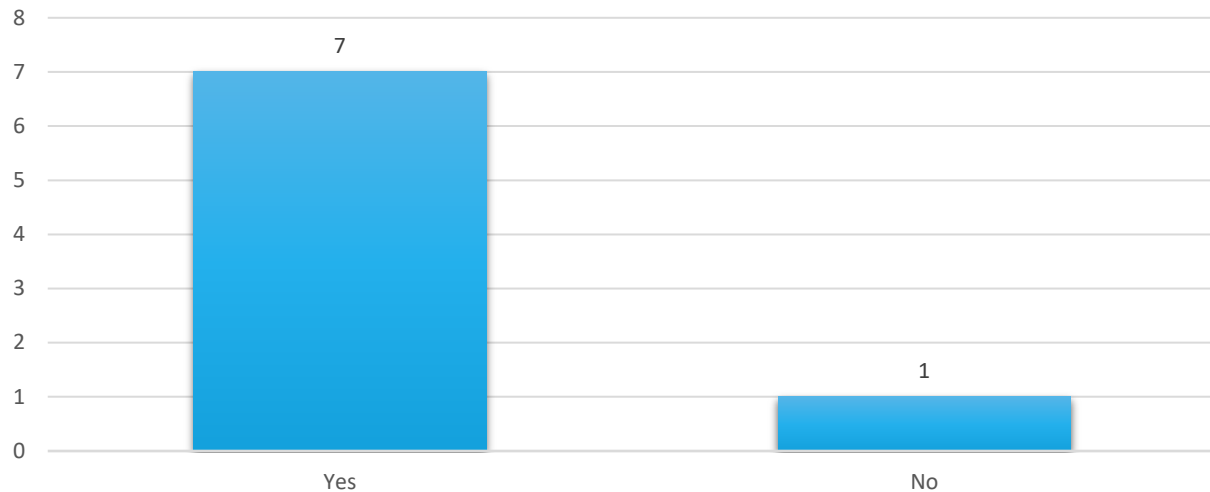
### I now know what to do if my home or business is at risk of flooding?



### During a flood, I know who to contact



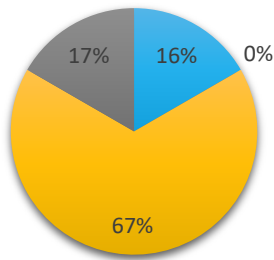
### Did you find the information presented at the event helpful?



### Summary of Meeting Feedback Forms - Stouffville

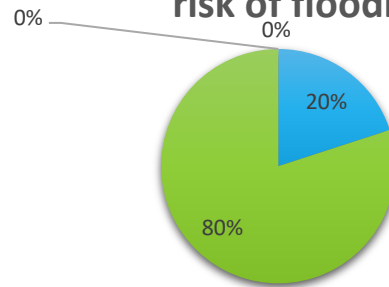
At the open house, feedback forms were provided to attendees to fill out. A copy is included in **Appendix B. 5** completed forms were received. Overall feedback included:

### How did you hear about this event?



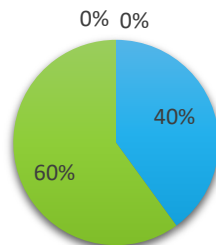
■ Social media ■ Poster ■ Flyer delivered ■ Newspaper

### My home or business is at risk of flooding



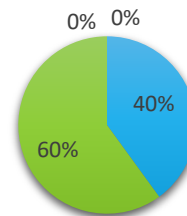
■ Strongly agree ■ Agree  
■ Neither agree nor disagree ■ Disagree

### I know where to find flood maps for the Town?



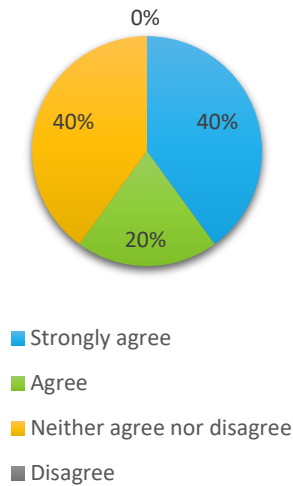
■ Strongly agree  
■ Agree  
■ Neither agree nor disagree  
■ Disagree

### I know where to find flood information (messages, resources) for my area?

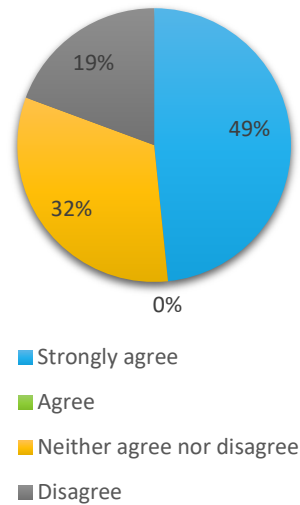


■ Strongly agree  
■ Agree  
■ Neither agree nor disagree  
■ Disagree

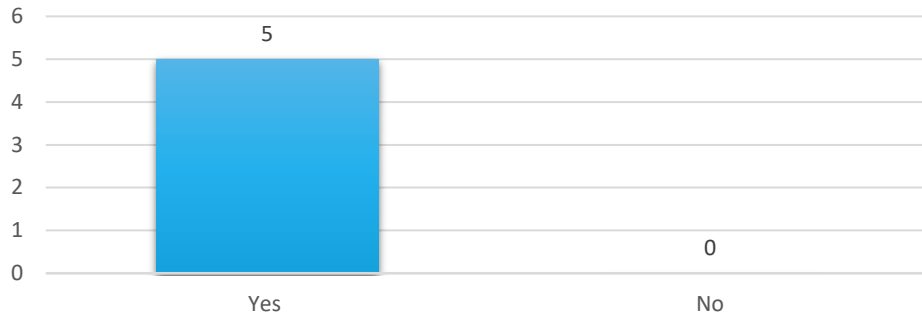
**I now know what to do if my home or business is at risk?**



**During a flood, I know who to contact?**



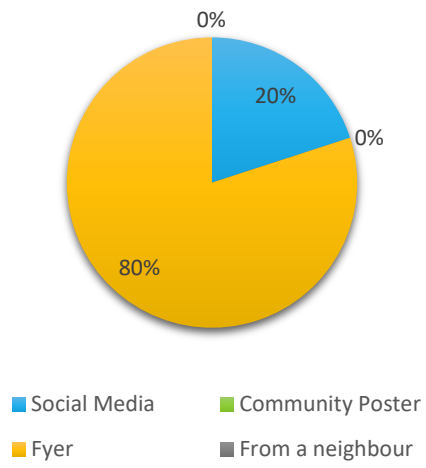
**Did you find the information presented at the event helpful?**



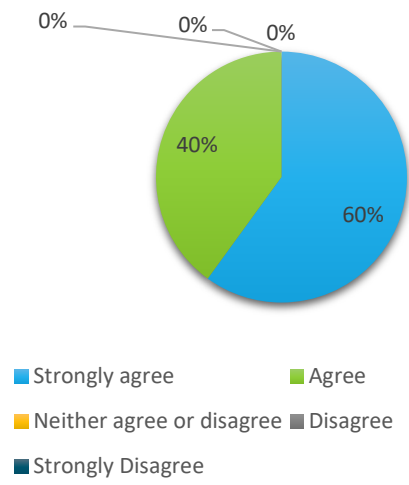
**Summary of Meeting Feedback Forms - Brampton**

5 completed forms were received. Overall feedback included:

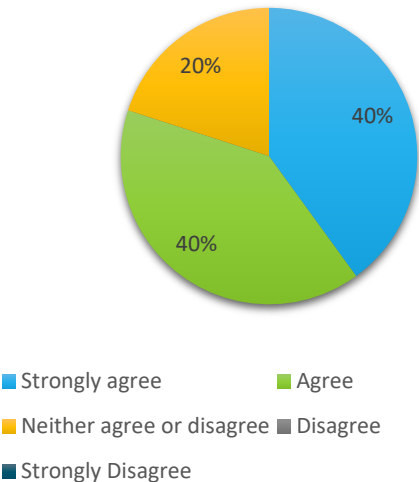
**How did you hear about this event?**



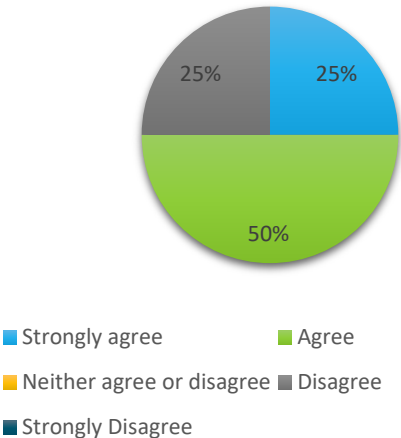
**My home/or business is at risk of flooding?**



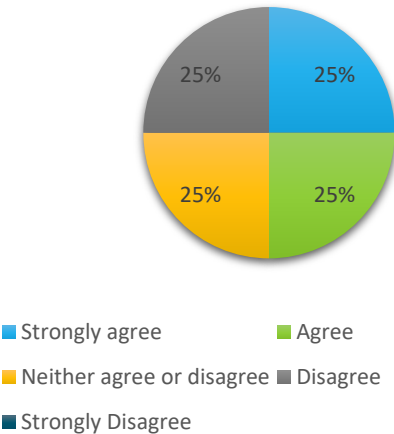
I know where to find flood maps for the City of Brampton?



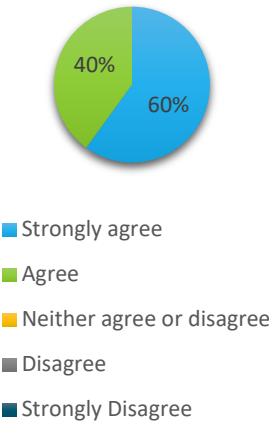
I know what to do if my home or business is at risk of flooding?



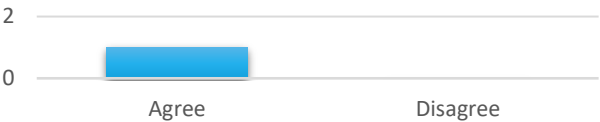
I know where to find flood information for the City of Brampton?



During a flood, I know who to contact.



Did you find the information presented at the event helpful?








Appendix D

TRCA’s digital flood handbook are available online through these links:

- [City of Brampton: Spring Creek](#)
- [Town of Caledon: Bolton](#)
- [City of Richmond Hill: Oak Ridges](#)
- [City of Vaughan: Woodbridge](#)
- [City of Mississauga: Dixie Dundas](#)
- [City of Markham: Markham Industrial](#)
- [City of Markham: Unionville](#)
- [Town of Whitchurch-Stouffville: Stouffville](#)
- [City of Toronto: Jane-Wilson](#)
- [City of Toronto: Rockcliffe](#)

LIVING IN A FLOOD  
VULNERABLE AREA:  
ROCKCLIFFE-SMYTHE

HOME » CONSERVATION » FLOOD RISK MANAGEMENT » LIVING IN A FLOOD VULNERABLE AREA:  
ROCKCLIFFE-SMYTHE  
SHARE:   

**Update**

Toronto and Region Conservation Authority (TRCA) and City of Toronto have been working together to reduce flood risk in the Rockcliffe-Smythe area.

LEARN MORE

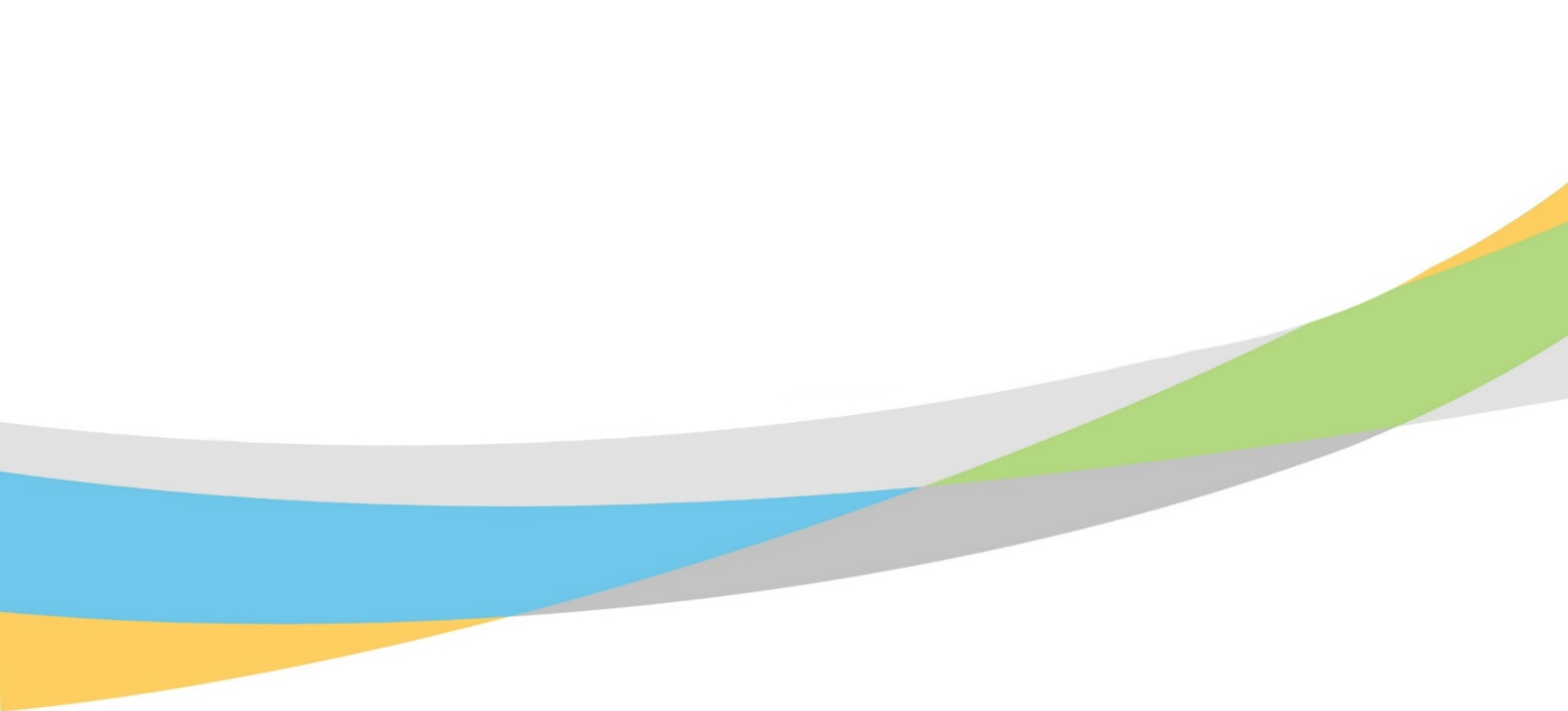
Use the information on this page to help you understand and prepare for flooding if you live near Black Creek in the City of Toronto.

1. KNOW YOUR RISKS

2. BE PREPARED

3. STAY INFORMED

For more information contact Rhianydd Phillips, Flood Risk Management Outreach Coordinator  
Engineering Services | Development and Engineering Services  
T: (416) 661-6600 ext. 5619 E: [Rhianydd.Phillips@trca.ca](mailto:Rhianydd.Phillips@trca.ca)



[www.trca.ca](http://www.trca.ca)

