

# Hazard Identification and Risk Assessment Program

## Methodology Guidelines 2019 Annex A: Scenario Workshop Tool



Office of the Fire Marshal  
and Emergency Management



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# Introduction

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This guide will help support the delivery of scenario-based workshops for the purpose of informing HIRA.

Scenario workshops help develop an applied understanding of the risks posed by hazards, and highlight potential impacts to the community.

The tools outlined in this guide can be used to inform the community's annual compliance exercise, and are consistent with the Ontario '[Guidelines for the Development of an Exercise Program](#)' as well as the exercise design curriculum for courses EM125 and EM225 offered by Emergency Management Ontario.

## **External resource:**

The [Participatory Asset Mapping Toolkit](#) is a free and useful tool for building community knowledge, and can be adapted for use as part of Risk Assessment. This resource is designed by the award-winning organization 'Community Science' are extremely useful to guide Participatory Community Mapping activities.

# Purpose and Scope

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The scenario development workshop is designed to take place as part of the third stage of HIRA 'Build Community Knowledge, in order to inform step 4 'Assess Risk'.



The aim of the workshop is for participants to discuss and build a scenario for each hazard that will become the basis for risk assessment. The workshop participants should be members of the **advisory group**.

Before the workshop, the organizer should establish a clear purpose and scope. This will in turn help define the specific narrative of the scenario.

## Purpose

The purpose of scenario development for HIRA is as follows:

To enable the participants to share expertise and evaluate risks in a dialogue-based, participatory and dynamic method, that utilizes their collaborative knowledge, expertise and experience.

This statement can form the baseline for your own customized purpose statement.

## Scope

The scope of the workshop should be to build an understanding of the specific effects of each hazard. Participants can be given some guiding information to get them started; at a minimum the workshop coordinator should provide:

- 1. Geographic scope:** Specific limits of where the hazard can occur, as applicable. Are they to consider all of Ontario, or a specific region or community?
- 2. Exposure:** If you wish participants to focus on specific elements in the community, be specific about the critical infrastructure, population or other areas of interest.

Include a map of the in-scope location (and specific exposed people or assets, if applicable). Also try to ensure that the corresponding and appropriate subject matter experts are in attendance.

The workshop works best when limited to one or two hazards. Ensure that the basic details of the scenario are well-defined, and the map reflects an area that is realistic for the hazard.

# Template Participant Email

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Participants in the HIRA workshop should be diverse, and ideally representative of a number of perspectives from across the community. **HIRA step 1 'Plan' contains more information on potential community partners.**

If the workshop is intended to explore a specific hazard or hazards determined by the workshop organizer, the email below should be further customized to include this.

The template email invitation below provides guidance for this, and can be shared with participants (customize highlighted, bracketed text):

Good afternoon **[participants]**,

Each year, **[organization name]** is required to complete a Hazard Identification and Risk Assessment, to inform planning priorities for potential emergencies. The 2019 assessment will include a discussion-based hazard workshop, designed to explore hazard likelihood and consequence.

This message is to invite you to participate as an expert partner in this year's assessment of **[specific hazard(s)]**. **Please read the message below carefully, as it contains important instructions.**

It is crucial that the perspectives and expertise of participants are shared at the workshop. Each participant should therefore use their own knowledge to **prepare a scenario that would create severe impacts to [insert a specific location]**. Participant scenarios will help inform the basis of workshop activities. These three key questions may help you to define a scenario:

- What hazards are of the greatest concern to you, and why?
- Are there potential gaps you see in the existing capacity to cope with hazards?
- What key trends do you feel will affect hazard risk in the next 10 years?

**[OPTIONAL]** Attached you will find a number of resources that will help you summarize your scenario, including a 'Scenario Narrative Template' **[attach template created using the following pages]**. Be as detailed as time will allow, and keep in mind that there is no right or wrong answer. This exercise is intended to explore your unique perspective. If you would prefer to develop a scenario with other workshop participants, you are welcome to do so **[optional statement - provide participant list if applicable]**.

Feel free to consult resources such as maps, models, research or other information you feel is relevant to inform your scenario(s).

If you have any questions about the workshop, or the development of a scenario, please contact: **[event organizer or contact]**.

The Workshop details are: **[insert details]**

# Preparing the Workshop

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Before the workshop, be sure to circulate any relevant materials shared by participants (as requested in the template email, page 5).

Also ensure you have the following:

- Attendance sheet
- One large map for each group of up to 6 participants.
  - Should be specific to the chosen location and exposed people or assets
- Print-outs of all participant sheets in this document.
  - Marked in the top-right corner with this icon: 
- Markers for brainstorming and drawing on maps
- Large-format blank paper for group note-taking and brainstorming
- Participant access to the internet (ideal for checking information during the workshop)

Also ensure that you have a way to record information generated through the workshop. This could consist of a scribe to record the feedback to the whole group. It is also useful to ensure participants know at the outset to write clearly, so that brainstorms and notes can be collected and transcribed later.

**The following pages will provide a step-by-step process for a HIRA workshop. This can be adapted and customized as necessary.**

**Please note:** This process is not mandatory for compliance with the Emergency Management and Civil Protection Act.

# Workshop Overview

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The workshop ideally consists of a maximum of 30 people. The duration outlined here is 2 hours long, and is designed for a single hazard.

If possible, ensure the following tools and resources are available for group participants to access:

- General Community map (infrastructure and boundaries)
- Map of applicable population groupings (vulnerable populations, low income etc)
- Background data, information, reference materials as applicable.
- Large-format paper and pens (for brainstorming)
- Scrap paper
- Writing pads and paper

Ideally, one large-format copy of each type of map per 5-10 participants is ideal to facilitate brainstorming and interactive use of these resources.

The workshop should be conducted around four main activities. Each are explained in detail following this summary:

1. **A) Identify hazards** (5 Minutes)
1. **B) Choose a hazard** (10 minutes).
2. **Share your scenario** (20 minutes).
3. **Build Community Knowledge:** (20 minutes)
4. **Impact Pathway Activity** (20 minutes)
5. **Risk Scoring** (30 minutes)
6. **Closing** (15 minutes)

**Be sure to leave enough time for step is #5!**

**Drawing and doodling on maps and large-format paper should be encouraged!**

# ACTIVITY 1:

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## A) IDENTIFY HAZARDS\*

Activity type: Individual

Activity Duration: 5 minutes

1. Using the checklist provided, identify hazards that may affect your in-scope geographic area.
2. Write down as many potential triggers as you can for one of the selected hazards.

From the **2019 HIRA Guideline** document, print:



- Page 19: Identify Hazards in your community

## B) CHOOSE A HAZARD\*

Activity type: Group

Activity Duration: 10 minutes

3. Share and discuss your perspectives on the hazards for the in-scope geographic area.
4. Select one hazard to use for the remainder of the session.
5. Fill the 'Basic Scenario Details' worksheet for this hazard. (Page 10)

\*If the hazard for the workshop is pre-determined by the organizer, skip to activity 2.

## ACTIVITY 2:

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### SHARE YOUR WORST-CASE SCENARIO

**Activity type:** Groups of up to 6

**Activity Duration:** 20 minutes

1. As a group, share and discuss your perspectives on what is a worst-case scenario for the chosen hazard, for the in-scope geographic area.
2. Develop a single scenario that addresses the balance of concerns and ideas expressed. You will use this scenario as a basis for the remainder of the session.
3. Use the 'Scenario Narrative' worksheet (page 11) to summarize the key information quickly and concisely for the group consensus scenario.



## The Narrative

- A narrative is a brief description of the events that comprise the scenario. The creation of this narrative helps the advisory group develop details, specific activities, and potential effects that may occur.
- This collaborative thought process is extremely valuable. It enables the group to address assumptions, understand perceptions, and discuss risk in the development of a realistic scenario.

The first step to developing a scenario is to establish basic information about the hazard and context. These details include:

### 1. **Type of hazard:** Each hazard is scored based on a specific scenario.

For the purposes of the HIRA workshop, you could choose a hazard that:

- a) is considered the most severe
- b) is considered the most likely
- c) is thought to be the least understood
- d) has the potential to challenge the capacity of the preparedness, response and recovery actions that are planned to occur.

### 2. **Triggering event:** Define the specific causes and trigger of the hazard you choose. This may assist workshop participants in creating the scenario.

For example, if you choose 'flood' as your hazard, you should also describe what led to the flooding. In this case it could be:

- Extreme precipitation
- Storm water system failure
- Snow melt
- Ice break-up
- High winds
- Soil moisture conditions
- Ice jams
- Frazil ice
- Natural dams

### 3. **Hazard Type (If applicable):** Any relevant characteristics of the hazard.

For flooding, this would include the type of flooding:

- Riverine (Fluvial)
- Urban (Pluvial)
- Flash Flooding
- Storm Surge
- Seiche
- Coastal Flooding

## Scenario Narrative

Also ensure you have a good idea of the following:

- Size, extent, speed of the hazard, and other relevant characteristics
- Route or extent of the hazard effects. Does this incident cross jurisdictional boundaries or organizational mandates?
- Damage or injury that occurs, and location/area where it occurs
- Planned (formal pre-organized response) or unplanned (informal response) actions taken
- How current events, environment or other conditions affect the scenario
- How the public find out, and how they respond
- Other factors that influence the response

# ACTIVITY 3:

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## BUILD COMMUNITY KNOWLEDGE

**Activity type:** Groups of up to 6

**Activity Duration:** 20 minutes

Use the 'Scenario Context' worksheet (page 13) to summarize key information:

1. Identify people or assets that would fall within any of the following groups, as a result of the proposed hazard scenario:
  - a. **Exposed:** located in, or indirectly affected by, the hazard-affected area
  - b. **Vulnerable:** Susceptible to the damaging effects of the hazard
  - c. **Low capacity:** Hazard falls outside of the planned or inherent resources of the asset or people.
2. Indicate key partners and stakeholder for emergency preparation and response in this area. Consider asset ownership and management.
3. Identify and draw any applicable jurisdictional boundaries or lines of responsibility on the map.



Once you have the basic details, consider how Individuals, Community Groups, Infrastructure owners and operators, Government functions or the private sector may experience the following:

- Who or what may be exposed to the hazard?
- Who or What may be vulnerable to the hazard?
- Who or What have low capacity to manage this hazard and its effects?
- What sort of existing capacity is there to respond or adapt? This can be formal capacity (first responders etc) or informal (citizens, groups etc).
- key partners and stakeholder for emergency preparation and response in this area. Consider asset ownership and management.

## Infrastructure

- Who owns or operates it?
- Are there regulations for its operation?
- Where are assets or systems located, are they exposed to hazards?
- What other assets or infrastructure are connected or dependent?
- Are there existing strategies for asset protection and assurance? (including standards, policies or procedures)
- Is an all-hazard planning approach used?
- Do assets and infrastructure have continued improvement programs?
- Do measures recognize the changing nature of risk?

## **ACTIVITY 4:**

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### **IMPACT PATHWAY ACTIVITY**

**Activity type:**        **Groups of up to 6**

**Activity Duration:** **20 minutes**

Use the large-format paper, or alternative medium, to brainstorm the effect and impact of the worst-case scenario you have developed using an impact pathway diagram.

Use the instructions on page 16 to guide you.

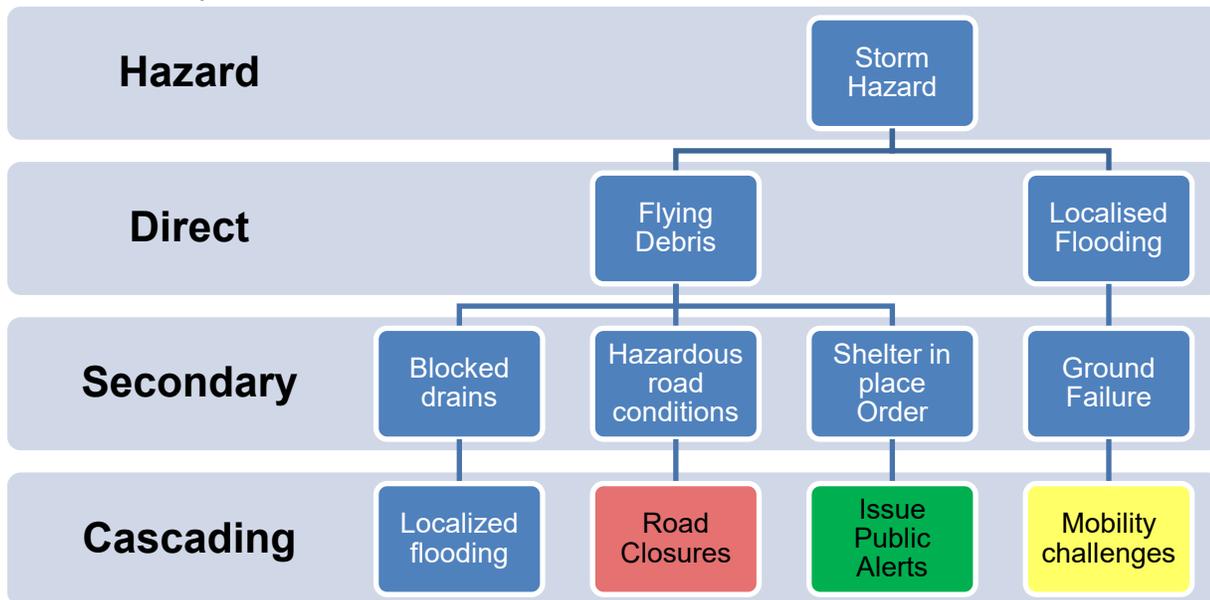
# Impact Pathway Diagram



To create an **impact pathway diagram** (Flow chart), start at the top of the writing space (paper, whiteboard etc), and move one level down with each step:

1. Main hazard for assessment
2. Direct consequences of the hazard, including other hazards which may occur
3. Secondary effects of the hazard(s), including other hazards which may occur
4. Other (cascading) effects, recorded using as many additional levels as needed.

A basic example is included below:



- Add specific **critical infrastructure** impacts to the diagram, as shown in pink above (road closures).
- Make note of any particularly exposed, vulnerable or low capacity groups as needed. An example is shown in the yellow box above (mobility challenges).
- Specific **response actions** may also be highlighted through desired actions, highlighted in green in the chart above (public alerts).

# ACTIVITY 5:

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## RISK SCORING

**Activity type:** Groups of up to 6

**Activity Duration:** 30 minutes

Now that we have a well-developed scenario, it is time to score the hazard using the equation **Risk = Likelihood x Consequence**.

1. Work through the scoring worksheets (page 19) to create a final score for the hazard.\*

From the **2019 HIRA Guideline** document, print: 

- **Page 31-36** 'Step 4: Assess Risk'

### **Note on Scoring:**

Consequence scoring is designed to be relative to the community that is affected. The level of consequence in each sub-category intentionally does not provide specific numbers or metrics with which to rate the consequence, only guidance.

In assessing consequence for a specific hazard, consider the potential **capability** of the relevant partners **already involved** in prevention mitigation, preparedness, response, and recovery activities. If the hazard will stretch capability within a specific consequence category (i.e. fatalities, social connection etc), the risk may be medium. On the other hand, if the capability will break it is probably a high consequence.

# Scoring Sheets



## Likelihood Scoring Table

Hazard	Category	Score	Justification and Notes



# Scoring Sheets (continued)



## Risk Score Summary Worksheet

Use the scores for likelihood and consequence, and enter them into the table for each hazard.

**Multiply** the values for likelihood and consequence to get a **total risk score** for each hazard.

Hazard	Likelihood	Consequence	Total Risk Score	Notes



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