# AEMA's Hazard Identification & Risk Assessment (HIRA)

## 2024 Public Risk Conference


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# Agenda

- Introduction
- HIRA Background
- Assessment Scope
- HIRA Tool
- Systems Approach
- Questions

# HIRA Background

- In 2020, Office of the Auditor General released a report concluding “AEMA does not have an effective system to coordinate [a] provincial hazard assessment.”
- The report also concluded that, while the Agency had elements of a provincial hazard assessment system, it required:
  - Clearer roles and responsibilities for developing and maintaining the assessment
  - An adequate plan to guide the assessment
  - Updated methodology
  - Step to identify hazard treatment options

# Excerpts from Auditor General report


- "For the government to effectively reduce risk, plan for, and respond to, calamities like flooding, wildfires and pandemics, it must **understand the extent of Alberta's cumulative disaster risk now and in the future**."
- "It must also understand and plan for the cascading and multiple effects a disaster can deliver."
- "An effective provincial hazard assessment system is a **key building block for a mature emergency management system**."

# What is HIRA?

- Hazard Identification and Risk Assessment (HIRA) is a **methodology**
  - It can be used to identify and assess which hazards pose the greatest risk; and
  - Analyzes how likely hazards are to occur and how great their potential impact may be.
- It is designed to **augment**, rather than replace, **existing risk analysis processes**

***Note:*** *HIRA is not intended to be used as a prediction tool to determine which hazard will cause the next disaster.*

# In Scope Hazards

- Disasters that require:
  - urgent, immediate action;
  - cross-organizational or cross-jurisdictional coordination; and/or
  - potential use of extraordinary powers under declared state of emergency.
- Having the potential:
  - for significant impact on health, safety, welfare or environment; and
  - to overwhelm local emergency response capacity.

# Out of Scope Events

- Small-scale emergencies:
  - Individual structure fires
  - Traffic accidents
  - Small-scale hazardous releases
- Economic downturns or market loss:
  - Price of oil crash
  - Market downturns
- Intentional criminal acts:
  - Terrorism
  - Active shootings
  - Cyber-attacks
- So-called “creeping disasters”:
  - Long-term changes in the climate

# When to use HIRA? - Part 1

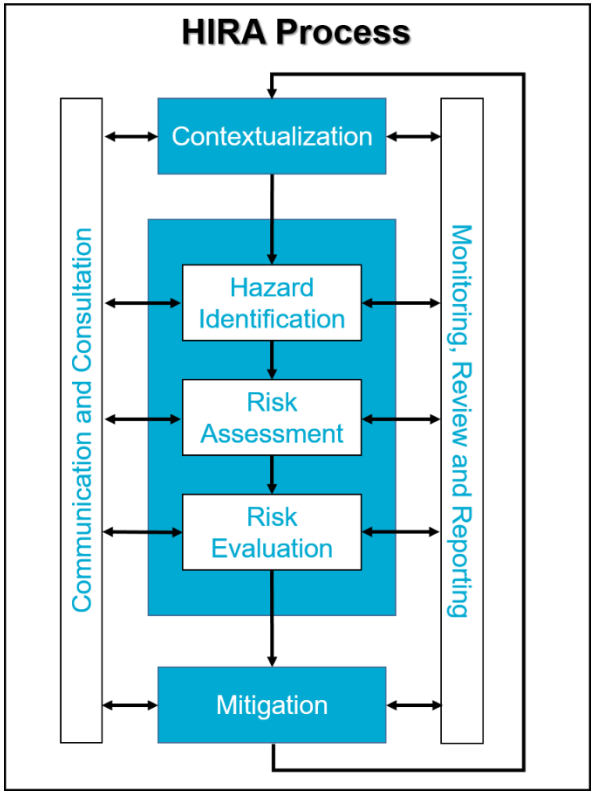
- For baseline hazard risk understanding
- A disaster/man-made incident has occurred
- Should underlying assumptions from a previous assessment change or are proven incorrect
- As emergency or risk management reviewed
- To meet expectation to complete a Hazard Assessment as set out in the Local Authority Emergency Management Regulation S. 4 (d)

# When to use HIRA? - Part 2

- Before local bylaws or policies are being reviewed/renewed (e.g., Area Structure Plans, Municipal Development Plan)
- The review threshold for a previous HIRA has been triggered
- New hazard(s) are identified
- New mitigation(s) are implemented or changes to existing ones are being considered

***Note:*** *A HIRA for every hazard type and class identified in Appendix 2 of the Reference Guide is not required.*

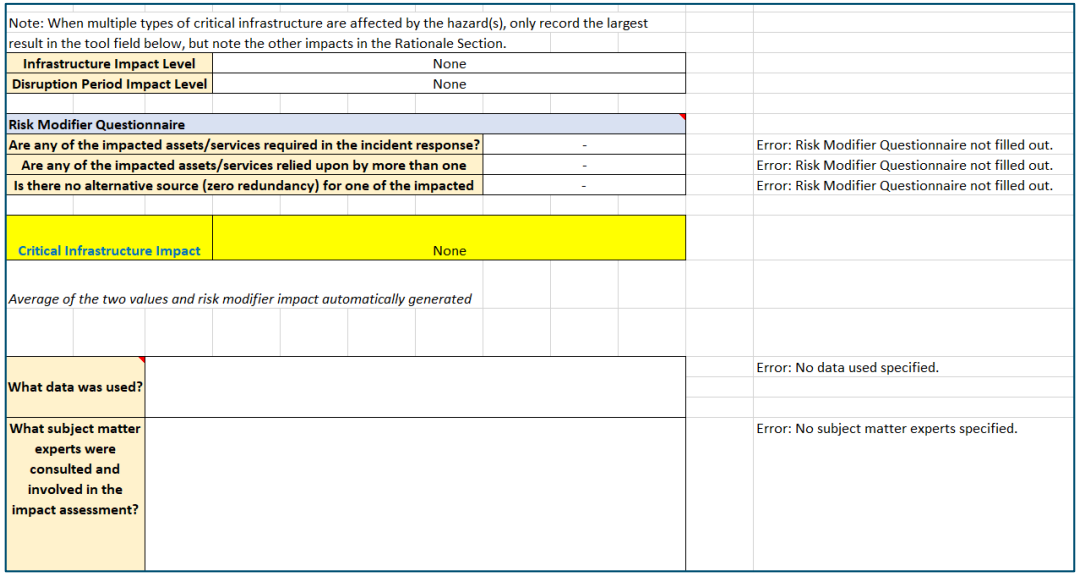
# HIRA Process



# HIRA Elements

# HIRA Elements

- Reference Guide
- Training courses (e-Learning Orientation and in-person Application Course)
- Statistical validation of HIRA Criteria application by University of Calgary
- HIRA e-Tool
- GIS Portal



Note: When multiple types of critical infrastructure are affected by the hazard(s), only record the largest result in the tool field below, but note the other impacts in the Rationale Section.

| | |
|---|---|
| Infrastructure Impact Level | None |
| Disruption Period Impact Level | None |

| Risk Modifier Questionnaire | | |
|---|---|---|
| Are any of the impacted assets/services required in the incident response? | - | Error: Risk Modifier Questionnaire not filled out. |
| Are any of the impacted assets/services relied upon by more than one | - | Error: Risk Modifier Questionnaire not filled out. |
| Is there no alternative source (zero redundancy) for one of the impacted | - | Error: Risk Modifier Questionnaire not filled out. |

| | |
|---|---|
| Critical Infrastructure Impact | None |

*Average of the two values and risk modifier impact automatically generated*

| | | |
|---|---|---|
| What data was used? | | Error: No data used specified. |
| What subject matter experts were consulted and involved in the impact assessment? | | Error: No subject matter experts specified. |

# Development Process

- HIRA materials are the product of:
  - a cross-jurisdictional and best practice review
  - a cross-GoA departmental review involving input from over 130 subject matter experts
  - strategic partnerships with Alberta Municipalities, Rural Municipalities of Alberta, and Alberta Health Services
  - a third-party review by the University of Calgary's Mathematics and Statistics department
  - targeted discussions with external to GoA parties
  - an accessibility review
  - extensive consultations with the Office of the Auditor General
  - Local Authority Walkthrough Sessions

# Local Authority Session Summary

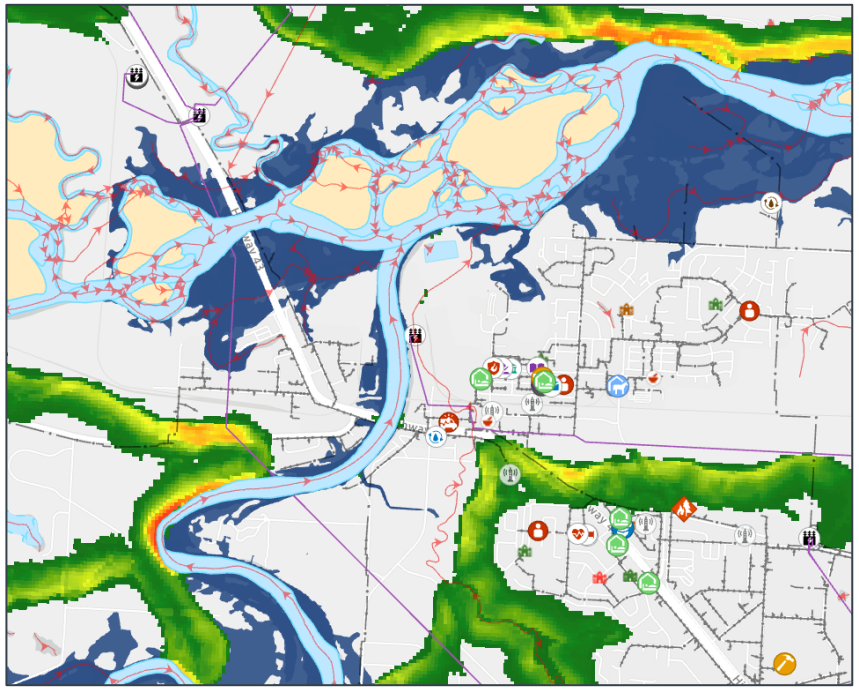
- Sessions were comprised of HIRA Application course and an illustrative HIRA assessment of a hazard (i.e., wildfire and flood) in the host community.
- **58** Participants with representation from:
  - **Municipalities:** City of Lethbridge, M.D. of Pincher Creek, Lethbridge County, Woodlands County, Town of Banff, Town of Cochrane, Municipality of Jasper, Town of Whitecourt, County of Barrhead, Town of Mayerthorpe, and Lac Ste. Anne County.
  - **Partners:** Alberta Municipalities and Rural Municipalities of Alberta.
- **7** Communities expressed interest in being early adopters
- **100%** of Municipal participants found the session valuable and thought there would be value in using HIRA for their community

# Systems Approach

## HIRA's Unique Analytical Path

# Systems Focus

- HIRA focuses on risk to critical systems supporting the health and safety of the area assessed rather than risks to individual organizations and their objectives.
- Human-centric approach
- Makes for a tool that can be completed at the local, regional, or provincial level



# Community Function Systems

- The six dimensions of community function HIRA uses to measure overall relative disaster impact are:
  - Healthcare System
  - Critical Infrastructure
  - Environment
  - Economic
  - Government
  - Social Function

# Critical Infrastructure Impact

## What is being assessed?

| Infrastructure | Description |
|---|---|
| Water | Inclusive of drinking water, wastewater, storm water facilities and associated systems and equipment. |
| Energy and Utilities | Inclusive of all phases of production and delivery; primary extraction, generation plants (including dams), transmission and distribution networks, pipelines and storage facilities required for continuity of electrical power and natural gas. |
| Health | Inclusive of all public and private access facilities monitoring and supporting physical and mental health, including hospitals, ambulance stations, health care centres, clinics, long-term and conjugant care facilities, group homes, pharmacies, community health services, health practitioners, and public health networks. Note: This category includes only buildings and equipment; staffing is reflected under the Healthcare System impact. |
| Information and Communication Technologies | Inclusive of telecommunications, broadcasting, software, hardware, and associated networks and towers or transmission infrastructure. |
| Transportation | Inclusive of the fixed installations and processes required to support the transportation system allowing for the movement of goods, people and emergency services delivery. Examples include roads, airports, rail, public buses/trains, traffic control signals and control centres. |
| Public Safety | Inclusive of all individuals and organizations responsible for maintaining public safety. Examples include fire departments, local police agencies (including local police departments of jurisdiction and Level 1 Peace Officers), emergency 911 and dispatch call centres, and emergency management agencies and organizations. |

# Critical Infrastructure Impact

## What are the criteria?

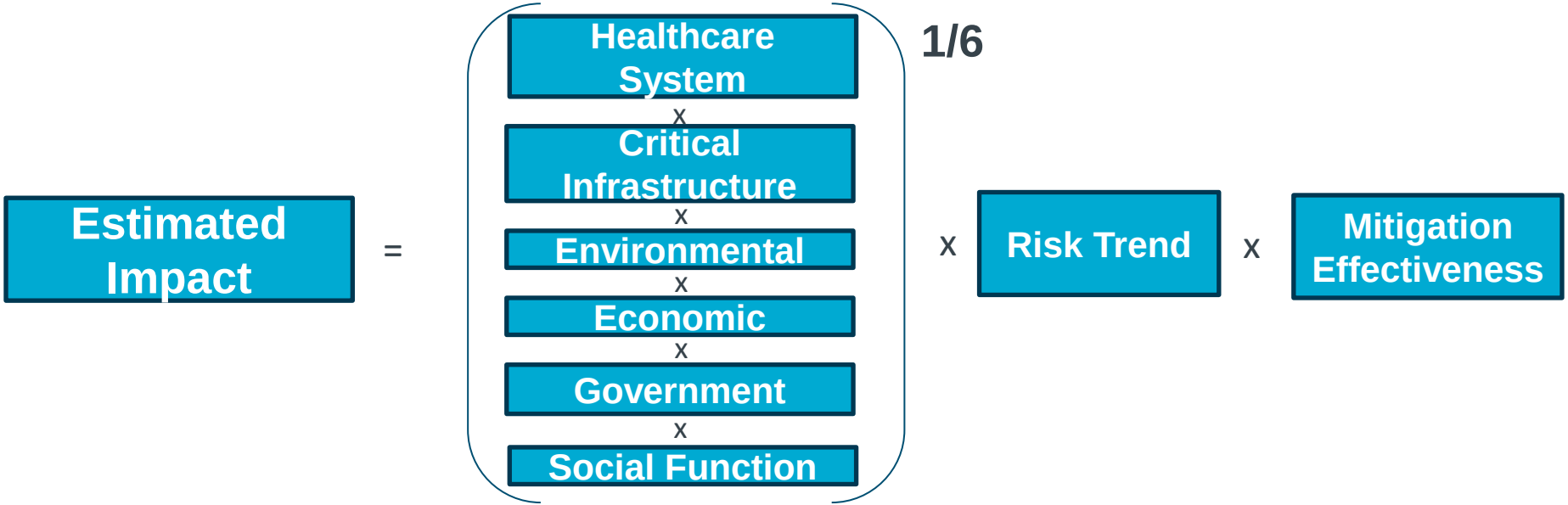
| Impact Level | Infrastructure Impact | Disruption Period |
|---|---|---|
| Catastrophic | ≥20% of the population, or ≥10,000 people, in the area of assessment without at least one service due to a disaster. | >72 hours |
| Major | 10 to 19.9% of the population within the assessment area without at least one service as a result of a disaster. | 48-71 hours |
| Moderate | 5 to 9.9% of the population within the assessment area without at least one service as a result of a disaster. | 25-47 hours |
| Minor | 2 to 4.9% of the population within the area of assessment without at least one service due to a disaster. | 13-24 hours |
| Limited | <2% of the population within the assessment area without at least one service as a result of a disaster. | 0-12 hours |
| None | No impact on services. | No disruption. |

**Note:** *The **average of Infrastructure Impact and Disruption Period** will be the impact level for that critical infrastructure. When multiple types of critical infrastructure are affected by the hazard, the overall critical infrastructure impact will be acknowledged by recording the biggest result between the calculated averages.*

# Estimated Impact

## How is it calculated?

The Estimated Impact is calculated by the formula:




***Note:*** *This is auto-populated in the HIRA Tool, and the user is not required to operate the equation.*

# Risk Categorization

## How is it calculated?

**Risk Categorization** = **Estimated Impact** x **Likelihood** x **Confidence Level**

*Note: This is auto-populated in the HIRA Tool, and the user is not required to operate the equation.*

# Risk Categorization

- Once all previous steps are completed, the HIRA provides the following:

| Category | Recommended Action | Recommended Review Interval |
|---|---|---|
| 4 | Complete categorization confirmation process.<br>Initiate enhanced monitoring.<br>Determine if supplementary analysis should be undertaken.<br>Evaluate potential risk treatments options | Review every 6 months. |
| 3 | Complete categorization confirmation process.<br>Initiate enhanced monitoring.<br>Determine if supplementary analysis should be undertaken.<br>Evaluate potential risk treatments options | Review annually |
| 2 | Determine if supplementary analysis should be undertaken.<br>Monitor and review risk at regular intervals | Review every 3 years |
| 1 | Monitor and review risk at regular intervals | Review every 3-5 years |

# Next Steps

- e-tool
- Facilitation and Research Guides
- e-tool course
- Implementation planning (mapping tools, hazard sequence)
- Communication plan for Local Authority roll out

# Conclusion

- HIRA aggregates information about a geographic area in combination with interdisciplinary stakeholder consultation to achieve a **consistent risk categorization**
- A completed HIRA analysis can be used to **foster resilience, consider mitigation strategies, and enhance community emergency management plans**
- While significant work remains, the target is to have this tool available to local authorities in 2025

# Questions?