

## Disaster Risk Assessment Summary 2025

The Disaster Risk Assessment is reviewed annually to account for changes that may alter the assessment of risk year-over-year and to identify new emerging risks.

### What are the highest risk hazards and threats in Calgary?

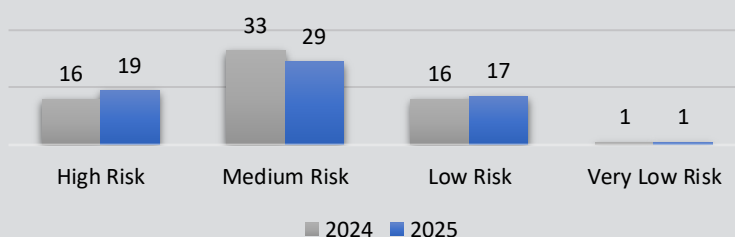
The following hazards and threats are assessed as High Risk and represent the highest disaster management priority.

<b>Natural</b>	Extreme Cold Extreme Heat Flood (Bow River 1:100) Flood (Bow River > 1:200) Flood (Elbow River >1:200)	Heavy Rainfall Pandemic Tornado Winter Storm
<b>Technological</b>	Critical Infrastructure Failure Dam Breach (Bow River) Dam Breach (Elbow River)	Rail Incident Water Distribution Infrastructure Failure
<b>Human-induced</b>	Active Assailant Cyber Attack (Critical Services/Infrastructure) Mass Attack	Mass Gathering Incident Protest or Demonstration (Illegal)

### What has changed since last year?

There are now 19 High Risks and 66 total risks. Flood (Elbow River 1:100) was downgraded from High to Low as events of this magnitude are significantly reduced with the Springbank Reservoir. Extreme Heat and Water Distribution Infrastructure Failure were upgraded to High due to increasing risk trends. Extreme Hydrological Drought was downgraded from High to Medium based on a reassessment of likelihood. Flood (Bow River >1:200) and Flood (Elbow River >1:200) are new risks added to account for larger magnitude events beyond current mitigation. Refer to Appendix 1 for a complete summary.

### Overall Risk Summary: 2024 vs 2025



### What else are we monitoring?

Medium Risks that are currently trending upwards are monitored as they have the potential to become more severe in the future and may require pre-emptive risk treatment strategies to manage their risk.

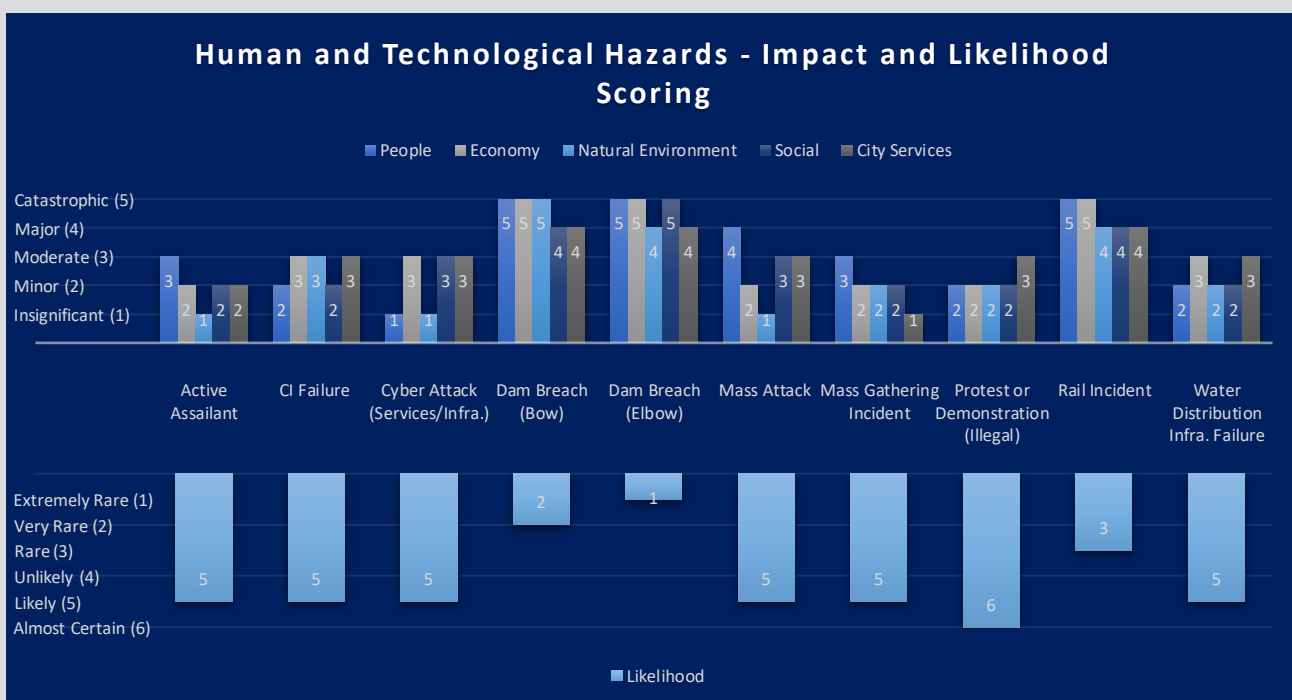
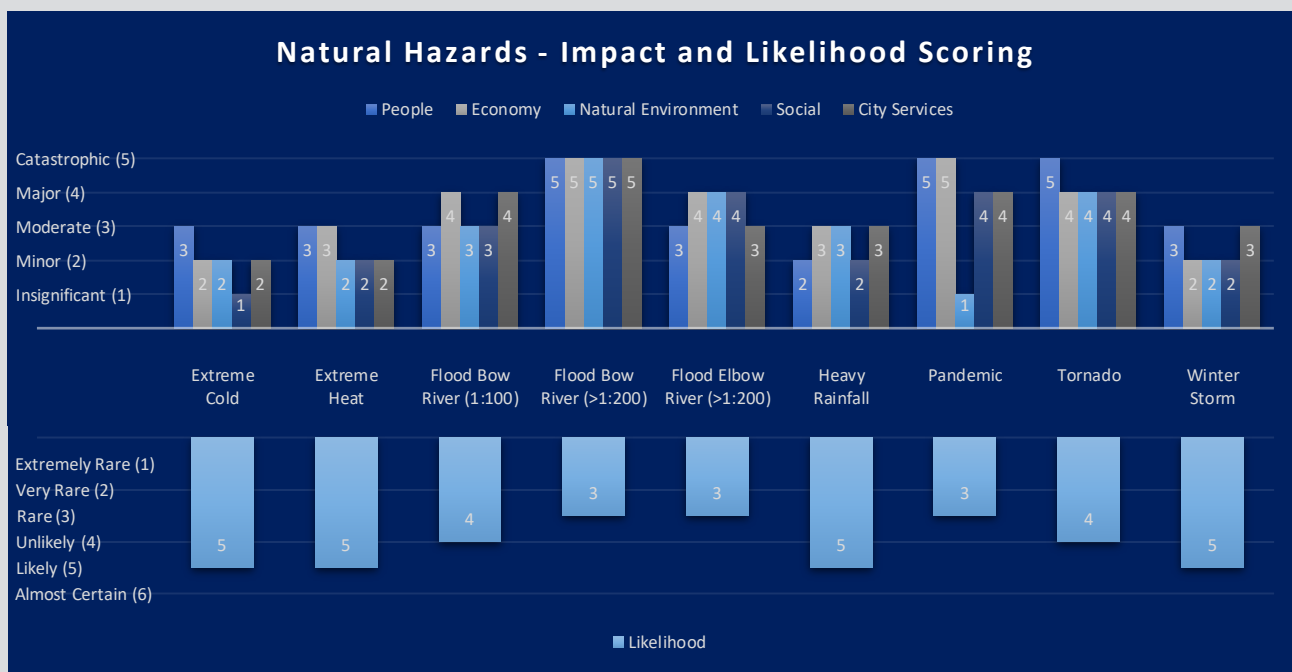
#### Medium Risks – Trending Upwards

<b>Natural</b>	Basement Seepage Flooding Extreme Hydrological Drought Extreme Solar Storm Major Solar Storm Poor Air Quality	Slope Failure/Landslide Stormwater Backup Flooding Wildland/Urban Interface Fire Windstorm
<b>Technological</b>	Sanitary Failure (Lift Station) Supply Chain Interruption	Water Contamination (Distribution)
<b>Human-induced</b>	Cybercrime - Data Fraud/Theft	

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## Analysis of the 19 High Risks

The following charts summarize the impact and likelihood scores for the 19 High Risks. Impacts are scored across five dimensions: People; Economy; Natural Environment; Social Environment; and City Services. Likelihood is scored across six frequencies: Almost Certain, Likely, Unlikely, Rare, Very Rare, and Extremely Rare.



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### Hazard and Threat Correlation Matrix

The worst catastrophes are combinations of events where a primary trigger event causes secondary cascading effects - resulting in the consequences being worse than if they had happened independently. The potential for one hazard or threat to trigger or exacerbate the effects of another is captured in this matrix. The darker areas (3 and 4) are the most critical as they have the highest potential to induce cascading events. The scoring is based on historical events, expert feedback, and an analysis of plausible future scenarios.

### Analysis

The correlation matrix illustrates the significant impact local hazards have on critical infrastructure and its importance to effective risk reduction. Critical infrastructure is the backbone of modern urban centres. Effective disaster response and recovery must be centred on building resilience into these systems, facilities, and services.

		Secondary Cascading Impacts																		
		Active Assailant	CI Failure	Cyber Attack (Services/Infra.)	Dam Breach (Bow)	Dam Breach (Elbow)	Extreme Cold	Extreme Heat	Flood Bow River (1:100)	Flood Bow River (>1:200)	Flood Elbow River (>1:200)	Heavy Rainfall	Mass Attack	Mass Gathering	Pandemic	Protest (Illegal)	Rail Incident	Tornado	Water Distribution Infra. Failure	Winter Storm
Primary Trigger Event	Active Assailant	1	2	1	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	
	CI Failure	0	4	1	2	2	1	1	1	1	1	1	1	0	1	0	2	1	3	1
	Cyber Attack (Services/Infra.)	0	4	4	4	4	1	1	1	1	1	0	1	1	1	1	0	0	0	0
	Dam Breach (Bow)	0	3	1	4	1	0	0	3	3	3	1	1	1	0	1	3	1	3	0
	Dam Breach (Elbow)	0	3	1	1	4	0	0	3	3	3	1	1	1	0	1	3	1	3	0
	Extreme Cold	0	3	0	1	1	0	0	1	1	1	0	0	0	0	0	1	0	3	1
	Extreme Heat	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
	Flood Bow River (1:100)	0	3	1	3	1	0	0	0	0	1	1	0	0	0	0	3	1	3	0
	Flood Bow River (>1:200)	0	3	1	3	1	0	0	0	0	1	1	0	0	0	0	3	1	3	0
	Flood Elbow River (>1:200)	0	3	1	1	3	0	0	0	0	1	1	0	0	0	0	3	1	3	0
	Heavy Rainfall	0	3	0	3	3	0	0	3	3	3	0	0	0	0	0	3	0	1	0
	Mass Attack	1	3	1	1	1	0	0	1	1	1	0	4	1	0	1	1	1	2	0
	Mass Gathering	1	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0
	Pandemic	0	3	1	1	1	1	1	1	1	1	0	1	2	1	2	1	1	0	0
	Protest (Illegal)	1	1	1	0	0	0	0	0	0	0	0	3	1	0	1	1	1	0	0
	Rail Incident	1	3	0	2	2	0	0	1	1	1	0	1	1	0	1	4	1	0	0
Tornado	0	3	0	1	1	0	0	1	1	1	0	1	1	0	1	3	1	0	0	
Water Distribution Infra. Failure	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Winter Storm	1	3	0	0	0	1	0	0	0	0	0	1	1	0	1	3	0	1	1	

4	<b>Cascading potential:</b> an event of this type can potentially trigger other sub-category hazards/threats within the same category (i.e. human-induced, natural, technological).
3	<b>Strong potential:</b> an event of this type can potentially directly trigger an event of the second type.
2	<b>Weak potential:</b> there is some potential for an event to contribute to the causal mechanisms that would trigger the occurrence of an event of the second type.
1	<b>Indirect potential:</b> no mechanism to cause an event of the second type but the impact of the second event would be worse due to resources already deployed and abilities to respond reduced.
0	<b>No potential:</b> the two event types are uncorrelated and if they occurred coincidentally their consequences would be broadly the same as if they occurred independently.

Source: based on work from the University of Cambridge

## Disaster Risk Assessment Summary 2025

### Appendix 1: Risk Assessment Results

Assessed risk for all 66 hazards and threats analyzed in the current Disaster Risk Assessment.

<b>High Risk</b>	Active Assailant Critical Infrastructure Failure Cyber Attack - Critical Services or Infrastructure Dam Breach (Bow River) Dam Breach (Elbow River) Extreme Cold Extreme Heat Flood (Bow River 1:100) Flood (Bow River > 1:200) Flood (Elbow River >1:200)	Heavy Rainfall Mass Attack Mass Gathering Incident Pandemic Protest or Demonstration (Illegal) Rail Incident Tornado Water Distribution Infrastructure Failure Winter Storm
<b>Medium Risk</b>	Basement Seepage Flooding Bridge Failure/Interruption Cybercrime - Data Fraud/Theft Electric Power Blackout Extreme Hydrological Drought Extreme Solar Storm Hailstorm Hazmat Incident Industrial Accident Lightning Storm Loss of Major Transportation Corridor Major Solar Storm Poor Air Quality Riot Road Accident	Sanitary Forcemain Failure (Lift Station) Security Incident at City Facility Slope Failure/Landslide Stormwater Backup Flooding Structure Fire Supply Chain Interruption Supply Emergency (Natural Gas) Telecommunications Failure Thunderstorm Transit Rail Incident Water Contamination (Distribution) Water Contamination (Downstream of Reservoirs) Wildland / Urban Interface Fire Windstorm
<b>Low Risk</b>	Aircraft Incident Earthquake (Magnitude 4.0+) Flood (Elbow River 1:100) Flood (Ice Jam) Fog Forcemain Failure (Purple Pipe) Forcemain Failure (Sludge) Gas Main Break Hostage Incident	Ice Accumulation Labour Action Moderate Pandemic Pipeline Incident (AER lines) Pipeline Incident (TNPL to YYC) Sanitary Failure (Water Body) Water Contamination (Spills) Water Contamination (Spills Upstream Glenmore)
<b>Very Low Risk</b>	Treated Effluent Pump Station Failure	