

Calgary Emergency Management Agency

Disaster Risk Assessment Summary

Overview

2021 was highlighted by the continued global response to the COVID-19 pandemic and numerous extraordinary climatic events that resulted in unprecedented damages.

As we completed year two of the pandemic, many jurisdictions struggled with balancing a desire to return to normalcy against managing the immediacy of the COVID-19 emergency. Governments faced challenges as a result of removing health restrictions too early or implementing them too late. As 2021 ended, COVID-19 numbers were rising across the globe and vaccination rates stalled – a strong indication that we still face challenges in the coming year.

In June, Calgary experienced a historic heatwave with 5 days in a row above 30C and two days reaching 36.3C (the 2nd highest all-time recorded temperature for Calgary). Alberta recorded new summertime highs for energy consumption, water demand was 1.5 times the 5-year average, and the heatwave resulted in an estimated 66 deaths.

Cooling centres were set up across the city, lodging locations for people living in unsafe residences were identified, water was delivered to vulnerable populations, and an Extreme Heat annex to the Municipal Emergency Plan was created. Climate models expect that these types of extreme heat events – more frequent high-heat days, drier summers, and multi-year droughts - will be more frequent in the future as a result of a changing climate.

During July and August, extreme wildfire behaviour in Western Canada led to widespread air quality warnings in Alberta. In November, an unprecedented atmospheric river in British Columbia caused catastrophic flooding across the lower mainland. This resulted in widespread damage to homes and infrastructure; leading to evacuations and severe supply chain interruptions that impacted Alberta.

Trends

The impact to the local supply chain as a result of the extreme rainfall events in British Columbia and ongoing global pandemic further highlight the vulnerability of the interconnected modern economy. Events experienced anywhere in the world can have cascading impacts to local food systems, critical infrastructure operations, and delivery of services. Building resilience to these types of shocks requires not only sound business continuity planning practices but also enhanced localized production capabilities.

There has also been a significant increase in cyber-attacks in the last few years. Foreign state actors and cybercriminals now target businesses, critical infrastructure, and governments with ransomware attacks. The goal is to steal and encrypt victims' data; locking them out of critical files and systems required to operate. This has led to a sharp increase in cybersecurity and insurance costs. The interconnectedness of the modern world has led to a reliance on technology to support critical infrastructure operations and delivery of essential services; resulting in cyberattacks being an emerging threat of concern moving forward.

Disaster Risk Register Update

In the 2021 review of the Disaster Risk Assessment, Major Dam Breach (Elbow River) was upgraded from a low risk to a high risk as a result of a reassessment of the economic impact of a potential worst-case scenario breach. There were no other changes in the risk assessment. There are now a total of 15 high and 33 medium risks that represent the highest level of planning priority for the Agency.

Calgary Emergency Management Agency releases a risk report every four years during the last year of the municipal budget cycle to support key decision-makers as they prioritize risk treatment strategies for their services during the next budget cycle. To ensure a more sustainable and resilient city, the Disaster Risk Assessment should help inform business, policy, and capital planning across The City of Calgary. Looking ahead in 2022, a new Disaster Risk Assessment will be completed, and a Disaster Risk Report will be released. This report will be shared with all Agency Members, Council, and senior City leadership. A public version will also be released.

Disaster Risk Register 2021

A high-level review of the Corporate Disaster Risk Assessment is conducted annually and summarized below.

High Risk	Catastrophic River Flooding Bow River Catastrophic River Flooding Elbow River Extreme Cold Major Critical Infrastructure Failure or Disruption Major Dam Breach - Bow River Major Dam Breach – Elbow River Major Hostage Incident Major Hydrological Drought	Major Mass Casualty Attack Major Rail Incident Severe Storm – Blizzard Severe Storm - Heavy Rain Severe Pandemic (Canadian Pandemic Influenza Preparedness scenario) Severe Storm - Winter Storms Tornado
Medium Risk	Extreme Heat Extreme Solar Storm (Carrington-level event) Loss of major transportation corridor Major Active shooter incident Major Basement Seepage Flooding Major Bomb Threat incident Major Bridge Failure/Interruption Major Civil Disobedience Major Cyber Attack - Technology as Instrument Major Electric Power Blackout Major Hazmat Incident Major Incident of Data Fraud/Theft Major Industrial Accident Major Mass Gathering Incident Major Riot Major Road Accident Major Sanitary Forcemain Failure (Lift Station)	Major Security Incident at City Facility Major Solar Storm (Quebec-level event) Major Stormwater Backup Flooding Major Structure Fire Major Supply Chain Interruption Major Telecommunications failure Major Transit Rail Incident Major Water Contamination - Distribution Major Water Contamination - Widespread Forest Fires Major Wildland / Urban Interface Fire Poor Air Quality Severe Storm – Hail Severe Storm – Lightning Severe Storm - Thunderstorms Severe Storm – Wind Water Distribution Infrastructure Failure
Low Risk	Flooding Ice Jam Major Aircraft Incident Major Cyber Attack - Technology as Target Major Forcemain Failure (purple pipe) Major Forcemain Failure (sludge) Major Freezing Precipitation Major Gas Main Break Major Labour Action	Major Pipeline Incident along Alberta Energy Regulator regulated lines Major Pipeline incident along the Trans-Northern Pipeline to Calgary airport Major Sanitary Failure Next to a Water Body Major Water Contamination - Watershed Spills Major Water Shortage Moderate Earthquake (Magnitude 4.0+) Moderate Pandemic (Canadian Pandemic Influenza Plan scenario) Severe Fog
Very Low Risk	Treated Effluent Pump Station Failure (purple pipe)	