

Calgary



Status of Emergency Preparedness in Calgary

2022

Calgary Emergency Management Agency

Rebuilding to resilience

Supporting safer and more resilient communities

The Calgary Emergency Management Agency (CEMA) and its nearly 60 member agencies work together to decrease disaster risks and increase the resilience of people, property, and systems.

Our work aligns with the five pillars of emergency management: prevention, mitigation, preparedness, response, and recovery

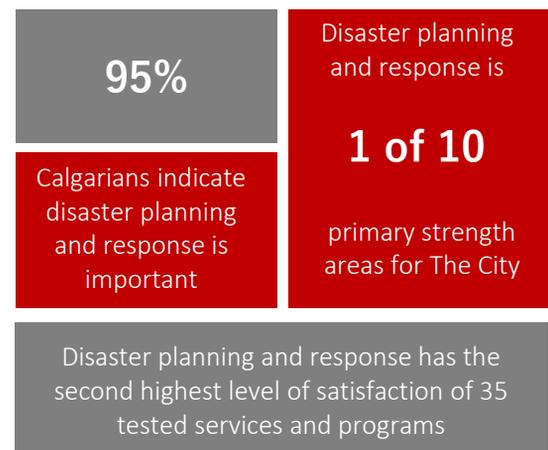


The foundation of our work is the *Disaster Risk Report* which provides a shared understanding of the risks in Calgary and focuses attention on those with the highest priority. This allows us to take a proactive and whole of society approach to managing risks instead of waiting for disasters to occur and then responding.

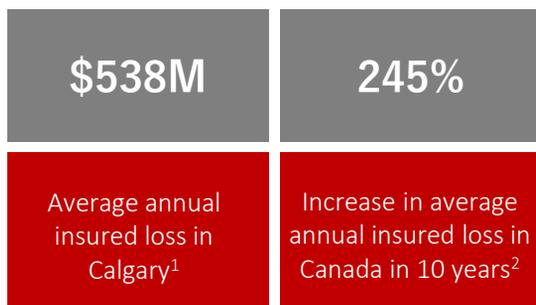
As we have seen from the events of this past year, including over 30 days of extreme heat and June rainfalls threatening to flood communities, Calgary is located in a very active area for severe weather. Climate change is expected to exacerbate many of these hazards, and more than ever we will need the collective efforts of all community members to remain resilient.

As we emerge from over two years of heavy focus on the COVID-19 pandemic, we know it has had a significant impact on Calgarians' health, the local economy, and The City of Calgary's level of preparedness. This past year marked a transition back to focusing on other constant and emerging emergency management priorities. The year ahead will be a time to rebuild our communities' abilities to withstand and rebound from emergency events. It also will be an opportunity to rebuild and strengthen our Agency members' capacity and readiness to respond.

What Calgarians tell us³



Disaster impacts on Calgary



Disaster risk in Calgary

In 2022, The City’s updated Disaster Risk Report was released to coincide with the 2023-2026 business planning cycle. With input from Agency member subject matter experts, it assessed 65 individual hazards and threats that pose a risk to Calgary. This risk understanding informs our planning, operations, and work with the community, as well as the prevention and mitigation efforts of our Agency members.

Three new high risks in 2022



CIVIL DISOBEDIENCE
Increased instances of civil disobedience



DAM BREACH (ELBOW RIVER)
Increased economic impact of worst-case scenario event



PANDEMIC
Reassessed due to widespread and lasting societal impact of COVID-19

Risk drivers

- Urbanization
- Climate change
- Interconnectivity
- Aging infrastructure
- Social determinants of health
- Increasing disaster losses

Calgary’s 16 High Risks

NATURAL

- Blizzard
- Extreme cold
- Flood (Bow River)
- Flood (Elbow River)
- Heavy rainfall
- Hydrological drought
- Pandemic
- Tornado
- Winter storm

TECHNOLOGICAL

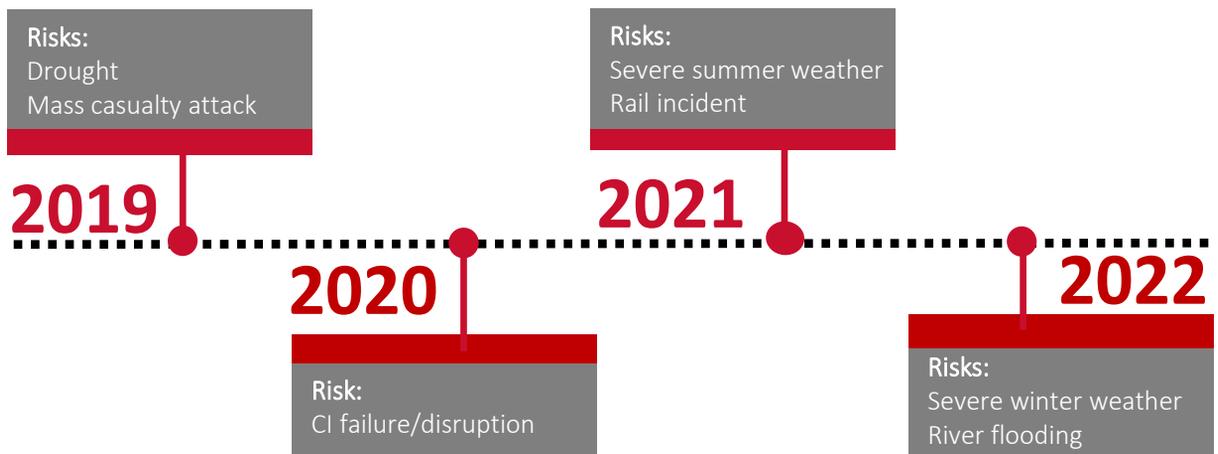
- Critical infrastructure failure
- Dam breach (Elbow River)
- Dam breach (Bow River)
- Rail incident

HUMAN INDUCED

- Civil disobedience
- Mass casualty attack
- Hostage incident

Presentations to Council

Throughout 2019-2022, CEMA provided the Emergency Management Committee of Council with an in-depth understanding of Calgary’s disaster risk environment and the work The City and our Agency members are doing to address Calgary’s high risks.



Calgary's risk landscape⁴

In addition to the 16 high risks, the Disaster Risk Report also assessed 49 hazards as medium, low, and very low risks.

MEDIUM RISKS

- Active shooter incident ↑
- Basement seepage flooding ↑
- Bomb threat incident
- Bridge failure/interruption
- Cyber attack (technology as instrument) ↑
- Electric power blackout
- Extreme heat ↑
- Extreme solar storm ↑
- Hailstorm
- Hazmat incident
- Incident of data fraud/theft ↑
- Industrial accident
- Lightning storm
- Loss of major transportation corridor
- Major solar storm ↑
- Mass gathering incident
- Poor air quality ↑
- Riot
- Road accident
- Sanitary forcemain failure (lift station) ↑
- Security incident at City facility
- Stormwater backup flooding ↑
- Structure fire
- Supply chain interruption ↑
- Telecommunications failure
- Thunderstorm
- Water contamination (distribution) ↑
- Water contamination (forest fires) ↑
- Water distribution (infrastructure failure)
- Wildland/urban interface fire ↑
- Windstorm ↑

↑ *Medium risks currently trending upwards with the potential to become more severe*

LOW RISKS

- Aircraft incident
- Cyber attack (technology as target)
- Earthquake (magnitude 4.0+)
- Flood (ice jam)
- Fog
- Forcemain failure (purple pipe)
- Forcemain failure (sludge)
- Gas main break
- Labour action
- Major ice accumulation
- Moderate pandemic
- Pipeline incident (AER lines)
- Pipeline incident (TNPL to YYC)
- Sanitary failure (water body)
- Transit rail incident
- Water contamination (spills)
- Water shortage

VERY LOW RISKS

- Pump station failure (purple pipe)

Flooding

Presented to Emergency Management Committee of Council on 24 May 2022

Catastrophic flooding can result from the Bow and Elbow Rivers and major dam breaches on the Bow and Elbow Rivers.



Severe Winter Weather

Presented to Emergency Management Committee of Council on 3 November 2022

Severe winter weather can include blizzards, extreme cold, and winter storms.

KEY FACTORS

- With Calgary at the confluence of the Bow and Elbow Rivers, the dynamics of these two rivers and their dams means that Calgary can experience sudden increases to river flow rates and high waters with little warning.
- Catastrophic flooding could result in significant risk to life safety of citizens in floodplains and river valleys. There could be significant economic implications as the downtown core would be severely impacted.
- Severe winter weather could result in risk to life safety of citizens, with increased risk for vulnerable populations.
- It has significant impacts on the mobility of Calgarians, which can result in cascading economic impacts.
- Critical infrastructure and supply chain disruptions may also result from these events.

TRENDS

- Experts predict the risk of river flooding will increase with climate change.
- Shifting precipitation patterns will bring warmer springs, earlier melt of mountain snowpack, and more intense storms.
- High river flow season may shift earlier, resulting in bigger floods occurring more often.
- The winter season will be shorter in the future with fewer extreme cold days, however Calgary will continue to experience winter storm hazards and volatile swings in extreme weather.
- Global warming increases the amount of energy available in the atmosphere to fuel severe storms, which may contribute to increased blizzard frequency and intensity.

MITIGATION

- Since the 2013 flood, The City has committed over \$150 million to various flood mitigation and resilience projects throughout Calgary. Once current and planned flood mitigation projects are complete, the entire city will be protected up to a 1:200-year flood event.
- The City also invested \$83 million to enhance flood handling, water supply, and dam safety resilience.
- The City's *Extreme Cold Weather Plan* establishes actions to be taken - including the opening of City-operated emergency warming centres - in the event of prolonged utility outages, critical infrastructure failures, or non-routine impacts on vulnerable populations.
- The City also updated its Snow and Ice Control Policy to deal with snow emergencies and severe weather events to expedite city-wide response.

After two full years of CEMA providing leadership in pandemic activities, 2022 marked the transition from COVID-19 response to a return to other emergency management priorities and rebuilding for future resilience. Although the year began at the height of the COVID-19 Omicron wave, by March the Emergency Operations Centre closed and the Municipal Emergency Plan was deactivated after more than 24 months. By June all Provincial health orders and most public health data monitoring ended.

This transition provided an opportunity for CEMA to build on the lessons learned through the pandemic, refocus on developing the Agency, and reprioritize other essential areas of emergency management.

After-action review

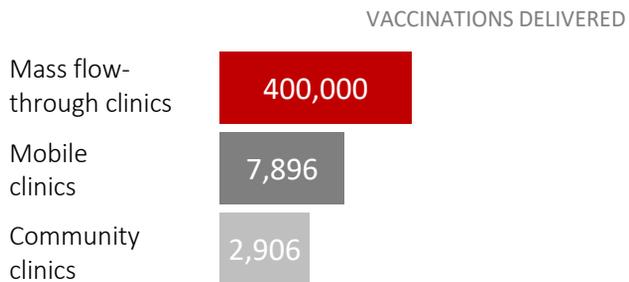
In late 2022, CEMA completed a *COVID-19 After Action Review* to ensure lessons learned from the pandemic will strengthen preparedness and resilience for future public health events and other emergencies.

Recommendations were developed in three key areas:

1. Clarify and refine Emergency Operations Centre processes, staffing, information sharing, and Agency support framework.
2. Capture and develop the best practices for community support and collaboration gained through the COVID-19 pandemic experience.
3. Strengthen collaboration with strategic partners.

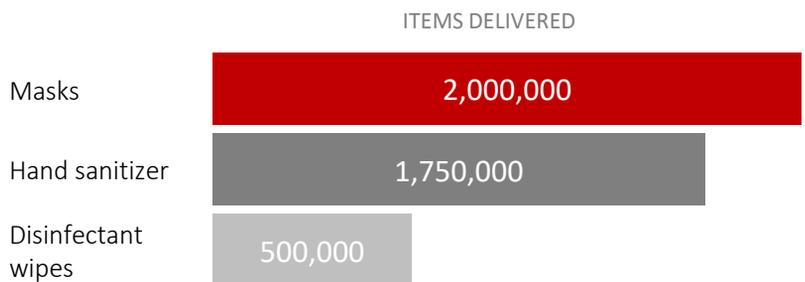
City-supported vaccination clinics

Since 2021, The City supported a variety of vaccination clinics to reach both mass audiences as well as more vulnerable communities.



Masks & health supplies

Throughout the pandemic, The City and its partners distributed much-needed supplies to citizens and communities.



Building future resilience

During the pandemic, CEMA convened an expert advisory Strike Team to discuss emerging issues, share information, and evaluate options for policies, communications, and other key decisions. Since then, this team has transitioned into a Public Health Task Force to maintain situational awareness and coordination on a range of public health issues.

CEMA, in collaboration with Agency members, updated the *Infectious Disease Stockpile Management Guide*. This document provides guidance on the acquisition and management of stockpiled essential equipment that will support workforce safety and continuity of services during an infectious disease event.

June heavy rainfall

In June 2022, CEMA and its Agency members came together to monitor forecasted heavy rainfall and prepare for the risk of river flooding in low-lying communities. The 100mm to 150mm of forecasted rainfall put tens of millions of dollars of public and private property and critical infrastructure at risk of flooding. A State of Local Emergency was declared as City crews, first responders, and partner agencies deployed temporary flood mitigation measures, including sandbags and berms. Unexpected high winds also resulted in downed power lines and trees adding to increased requests for service. Actual rainfall was lower than forecast as much precipitation fell as snow. However, The City was prepared with barrier deployments and mitigation measures introduced by The City since 2013.

By the numbers

2-DAY RAINFALL AMOUNT	5-DAY 311 STORM-RELATED CALLS	5-DAY 911 STORM-RELATED CALLS
80-100 MM	872 URGENT & PRIORITY	447 CALLS
 June monthly average is 80mm	 Same day call volume in 2021 was 292	 2.5X higher than average call volume

Proactive response

Early action allowed The City and Agency members to prevent flood and storm damages:

- Closed stormwater outfalls
- Lowered water levels in Glenmore Reservoir
- Deployed pumps to low-lying communities

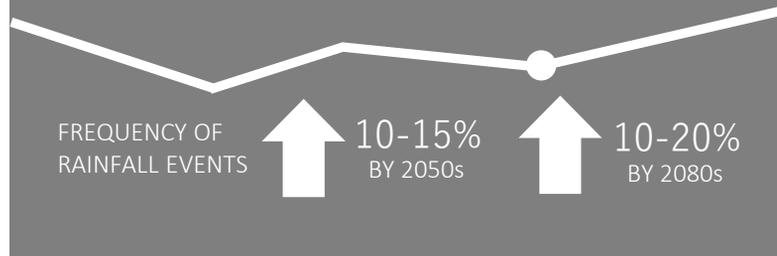
Mitigation pays off

While early coordinated monitoring and preventative response measures helped minimize damages, long-term mitigation projects played an essential role. The City and Government of Alberta investments in new flood mitigation infrastructure since 2013 has resulted in a reduction of flood damages of approximately \$93 million every year.

The combined and collective impacts of riverway and dam mitigation measures ensure Calgary is resilient to flood conditions today and ready to adapt to new conditions in the future.

The case for disaster risk reduction

Experts predict the risk of river flooding will increase with climate change. Shifting precipitation patterns will bring warmer springs, earlier melt of mountain snowpack, and more intense storms. Heavy rainfall and flooding are primary trigger events for other local risks, including critical infrastructure failures, dam breaches, and rail incidents.



Return on investment
Up to \$6 in savings
for every \$1 spent
on mitigation

CITY WILL BE PROTECTED FROM A
1:200*
YEAR FLOOD EVENT
PER CALGARY FLOOD RESILIENCE PLAN

FLOOD MITIGATION HAS RESULTED IN
55%
REDUCTION
IN FLOOD RISK TO THE CITY

SPRINGBANK RESERVOIR WILL SEE
70%
REDUCTION
IN ELBOW RIVER FLOOD RISK TO CITY

*2013 flood was 1:200

The 2022 City of Calgary Organization Realignment reached across all departments, business units, and service areas in The City. As a result, our Agency members moved and changed which meant we needed keep pace to ensure a consistent, continued level of preparedness. This work became a strategic priority for Emergency Management Operations. Although there has been organizational change, what has not changed is the expertise and efforts offered from the Agency when emergencies arise.



Adapting to the reorganization



Changes in Agency members representing select services

We shifted the Agency from business unit-level representation to a functional-based model. This change ensures all key services and groups are represented within the Agency and Emergency Operations Centre.

↑ 19%
NET NEW
AGENCY MEMBERS



New Agency members with limited emergency management experience

We have been working to deliver our training more efficiently and effectively to larger numbers of individuals, including new Agency members. Our annual exercises are aligned with Calgary's highest risks to ensure members are ready to respond.

↑ 35%
NEW AGENCY
REPRESENTATIVES

Plan forward

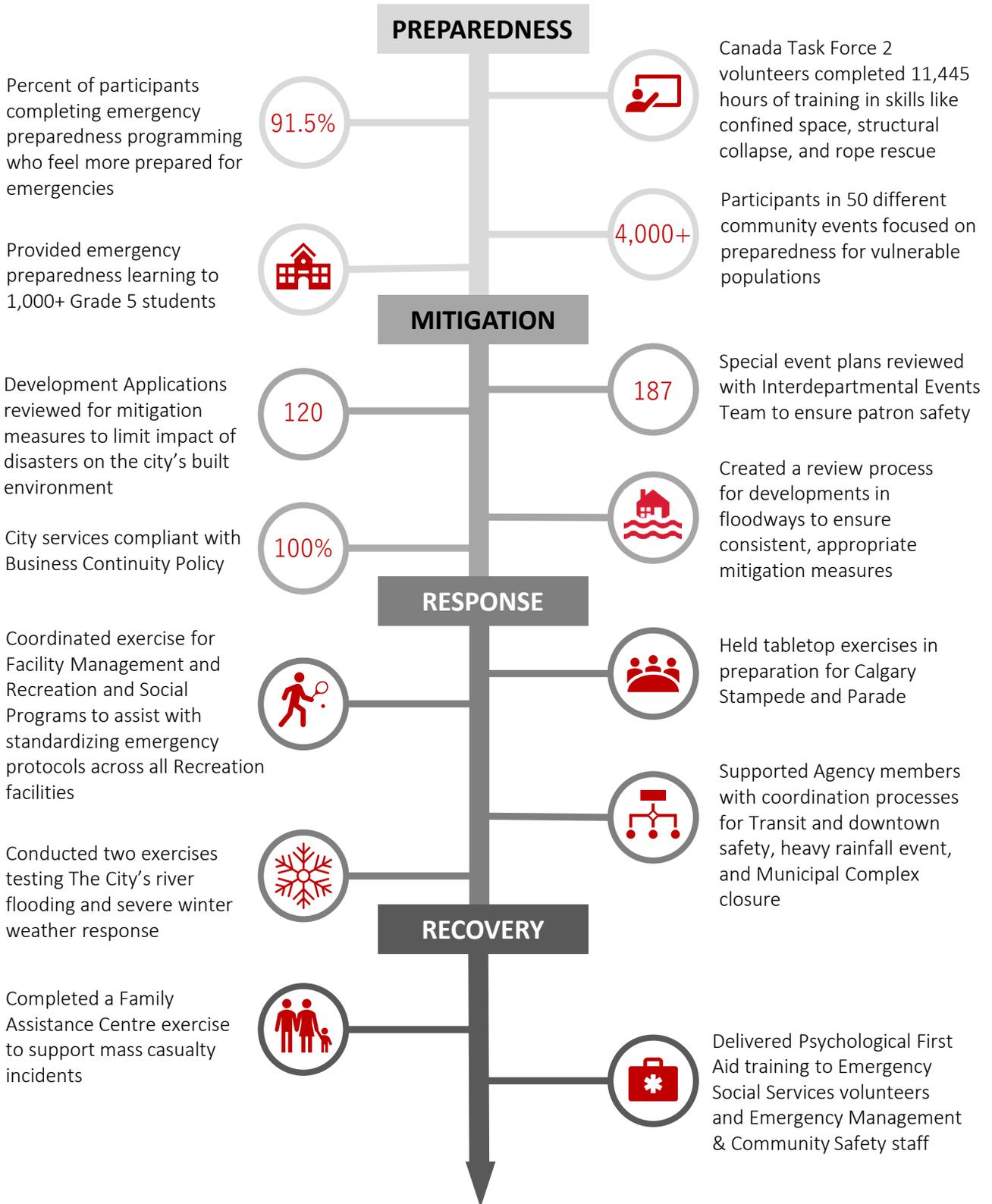
The Municipal Emergency Plan will undergo revisions and updates in 2023 to reflect these new organizational changes and further clarify the roles and responsibilities of Agency members.



Planning focus: Extreme heat & cold

The *Municipal Emergency Plan* contains a series of annexes that outline the plans to respond to Calgary’s highest disaster risks. Each annex identifies the thresholds and triggers that will be used to determine when a plan is activated along with key considerations and response activities for each type of emergency event.

<h2>Extreme Heat Plan</h2> 	<p>POTENTIAL TRIGGER</p> <p>DAYS WITH EXTREME WARNINGS IN 2022</p> <p>AT RISK POPULATIONS</p> <p>KEY ACTIONS</p>	<h2>Extreme Cold Plan</h2> 
<p>Daytime maximum temperatures for 2+ days are 29°C+ with a nighttime minimum temperature of 14°C+</p>		<p>Temperature or windchill is expected to reach -40°C for at least two hours</p>
<p>32</p>		<p>12</p>
<p>Citizens living alone without cooling systems in place</p> <p>Citizens on chronic disease registries</p>		<p>Unsheltered citizens</p>
<p>Providing information and maps for cooling locations, pools, spray parks, and public drinking fountains</p>		<p>Outreach and support to organizations supporting citizens experiencing homelessness</p> <p>Providing information and maps for overnight shelters and warming locations</p>
		



The Year Ahead



STRENGTHENING THE AGENCY

With many new Agency representatives resulting from the Corporate realignment, training will be a priority to ensure members working in the Emergency Operations Centre understand emergency management processes and procedures. We will also identify more opportunities for collaboration within Emergency Management & Community Safety, particularly between 911 and Emergency Management Operations.

SUPPORTING CLIMATE CHANGE ADAPTATION

CEMA will continue to support The City's Climate Resilience Strategy by collaborating with the Climate Team on shared priorities. We will continue to work to integrate climate adaptation principles and projected modelling into existing emergency management strategies and broader disaster risk reduction objectives.



FOSTERING CORPORATE RESILIENCE

The Corporate Business Continuity Program will undergo a significant update to ensure it reflects the organizational realignment. This will include a focus on onboarding, educating, and workshoping new business continuity elements in The City, a review and update of the Business Continuity Planning Policy, and a large-scale business continuity exercise in 2023.

BUILDING COMMUNITY RESILIENCE

We will focus on delivering community resilience programming that meets the needs of populations most vulnerable to disasters, including newcomers, older adults, Racialized community members, people with disabilities, and urban Indigenous community members.



ADVANCING CANADA TASK FORCE 2

A late 2022 recruitment campaign welcomed over 30 new Task Force members and 2023 will see additional targeted recruitment. New personnel coupled with lifting of in-person gathering restrictions that were in place during COVID-19 will drive a renewed focus on training in all areas, ensuring the team's readiness for any local, regional, provincial, or national event.



References

- ¹ AON (2022). 2021 Weather, Climate and Catastrophe Insight.
- ² Insurance Bureau of Canada (2021). 2021 Facts of the Property and Casualty Insurance Industry in Canada (43rd edition).
- ³ The City of Calgary (2022). 2022 Fall Survey of Calgarians.
- ⁴ The City of Calgary (2022). Disaster Risk Report 2022, Calgary Emergency Management Agency.