
REPORT NUMBER 004-2023-Infrastructure & Operations-Environment

DATE

PREPARED

December 19, 2022

FILE

MEETING DATE

January 9, 2023

SUBJECT

Climate Adaptation Update 2022

RECOMMENDATION

For information.

EXECUTIVE SUMMARY

Climate change is a significant threat for the City of Thunder Bay, and the threat continues to increase. Climate impacts include higher infrastructure costs; disrupted operations; aggravation of existing social issues; in addition to risks to the health, safety, and wellbeing of citizens.

The City of Thunder Bay Climate Adaptation Strategy: Climate-Ready City, is the municipality's guiding document for adapting to the impacts of climate change.

This Report provides an update on progress made in implementing the Strategy over the past year.

DISCUSSION

City Council declared a climate emergency on January 13, 2020, recognizing the urgent threat presented by the current and potential impacts of climate change. In the face of this challenge, the City of Thunder Bay recognizes the need for adaptation to reduce the unavoidable damages stemming from climate change.

Climate change is responsible not just for a rise in average global temperatures, but an increase in weather extremes and variations; a major risk and expense for municipalities. These changes magnify the existing infrastructure deficit by reducing expected lifespans of existing infrastructure and increasing the frequency of replacement. In addition, severe weather disrupts the local economy; damages the environment; and puts the population's health and wellbeing at risk. Investing in climate

adaptation is the most direct way to avoid or reduce future costs while mitigating risks to persons and property.

Effective climate adaptation requires considering social consequences. Climate change impacts are not fairly shared, and can make existing social problems worse. People who are Indigenous, elderly, newcomers to Canada, or with lower socioeconomic status are more likely to be exposed to climate hazards, while being less likely to be able to access resources to adapt, avoid, or bounce back. Work is needed and ongoing to adequately include these considerations into the Climate Adaptation Strategy. Without action, these disproportionate impacts limit the potential for progress within the City.

The City of Thunder Bay continues to experience climate impacts. Spring flooding in 2022 caused more than \$3 million in infrastructure damage in the City, a degree of flooding that would be considered a one in a hundred-year event based on “historic” climate conditions. This event follows other major flooding events in 2008, 2012, and 2016. Warm winters has led to the designation of Thunder Bay and area as a Lyme Disease risk area, as the species of ticks that carry the disease can now routinely survive our winters. Between 2021 and 2022, Thunder Bay experienced 28 days above 30° C, while the local historical average is only 2.7 days above 30° C a year, presenting a serious health risk particularly towards children, older adults, people living with chronic illness, and outdoor workers. Even if global action on reducing greenhouse gas emissions achieves its goals, these impacts are projected to continue to intensify for decades to come.

To address these challenges, The City’s Climate Adaptation Strategy is a long-term initiative that involves participation and engagement across all City Departments as well as collaboration amongst community stakeholders. It is a living document requiring ongoing effort to incorporate lessons learned, update best practices, and respond to experienced climate impacts. The Climate Adaptation Strategy complements the mitigation actions found in Climate Forward City: the Thunder Bay Net-Zero Strategy.

This Report provides an update on the Climate Adaptation Strategy relative to its seven Strategic Directions, identified below.

Strategic Direction Highlights

Integrate: Integrate climate adaptation into plans, policies, procedures, projects, and investment decisions.

1. The Asset Management Phase One Plan, approved by Council in December 2021, identified climate risks and sustainability considerations for the City’s core assets. As the City of Thunder Bay works through Phase two of the Asset Management Plan, climate risks are being identified along with potential mitigation and adaptation options for all assets. This will help inform decision-making and strategic long-term investments to reduce the infrastructure risks associated with climate change and capitalize on opportunities.

2. The Zoning By-law was passed pending appeals; implementing the City of Thunder Bay Official Plan which includes Climate Adaptation as an overarching approach.
3. Clean & Clear Yards By-law was passed in September 2022, incorporating “Natural Garden Areas” supporting greater use of native species and increased climate resilient habitat. Work continues on the Boulevard By-law to allow additional naturalization.
4. The development of a climate lens tool will be initiated in 2023, which will improve guidance for incorporating climate change considerations into municipal decision-making. This was identified as an action item in the Net-Zero Strategy and addresses a key action from the Climate Adaptation Strategy.

Assess Potential Threats: Understand the risks specific to climate change impacts.

1. Thunder Bay is piloting the newly created Regional Public Works Commissioners of Ontario (RPWCO) Climate Resilience Roadmap for Ontario Municipal Infrastructure and Systems. The pilot will assess the climate vulnerabilities of infrastructure and systems in an area of Thunder Bay, and will be used as a case study for the Roadmap.
2. Flood mitigation studies of the Intercity area were initiated to inform future infrastructure projects and outline large scale flood mitigation options.
3. Extreme weather events were identified as a priority risk in the corporations Enterprise Risk Management Initiative and is included in the Risk Analysis and Treatment Plan.
4. Corporate climate risk assessment will be renewed and reviewed in 2023 to help prioritize future adaptation actions.

Increase Resilience: Increase resilience of infrastructure and natural landscapes.

1. 800 trees were planted by the City in 2022, with a focus on areas lacking tree canopy cover.
2. The City partnered with the Lakehead Region Conservation Authority (LRCA) and the Thunder Bay District Stewardship Council supporting the environmental remediation of Fisherman’s Park West into a Climate Change Awareness Park; providing improved habitat, biodiversity, and opportunities for community learning.
3. The Boulevard Lake Dam was reopened following rehabilitation; improving resilience to storms and providing stormwater protection for downstream properties.
4. Rebate programs, including the residential drainage rebate and rain garden rebate, continue to be offered by the City through EcoSuperior to help citizens manage stormwater on their property.
5. Two green infrastructure facilities were constructed this year. A total of 28 green infrastructure facilities have been installed throughout the City, treating a catchment area of over 27 hectares. These facilities are in addition to 7 stormwater management ponds and flood storage systems that provide stormwater quality control to an additional 68 hectares of catchment area.

Inform and Equip: Provide information, tools and training on climate adaptation to facilitate and accelerate action.

1. EarthCare continues to deliver an information session through Corporate Orientation sessions with new city employees to provide education and training from a climate change perspective.
2. The City partnered with Lakehead University to develop a voluntary local review of the UN Sustainable Development Goals. The resulting report published indicators tracking environmental, economic, and social conditions throughout the City of Thunder Bay.
3. The City of Thunder Bay partnered with local secondary schools and EcoSuperior to introduce students to green infrastructure benefits and support the schools in constructing their own rain gardens.
4. The Thunder Bay Climate Change Connection website (climatechangetbay.com) provides citizens and organizations with a set of locally relevant resources related to Climate Change and Adaptation. This web site is maintained and promoted by EarthCare Thunder Bay.
5. EarthCare continues to engage with the public via booths, presentations, and public events.

Finance: Plan for the financing and long-term implementation of adaptive actions.

1. \$2 million was received through Northern Ontario Heritage Fund, and \$1.7 million was received through the Canada Cultural Spaces fund for the Centennial Botanical Conservatory Renewal, which will support creation of production greenhouses supplying the City's low impact developments and other green infrastructure; and improving public access to learning opportunities.
2. Public Safety Canada is contributing up to \$250,000 towards the InterCity Drainage Study - Phase 2 project under Intake 6 of the National Disaster Mitigation Program (NDMP).
3. Funding through the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health was received to support two projects: \$85,000 supporting the pilot of the RPWCO Climate Resilience Roadmap for Ontario Municipal Infrastructure and Systems, and \$30,000 towards climate-related emergency exercises.
4. ICLEI Canada committed \$15,000 towards an engagement project for local secondary schools on green infrastructure.
5. Thunder Bay continues to receive funds through the National Disaster Mitigation and Adaptation Fund (DMAF) including a \$13.1 million commitment for a Community Flood Mitigation Project to significantly upgrade Boulevard Dam and the stormwater system throughout Thunder Bay.
6. Letters of support were provided for projects seeking funding and supporting climate adaptation in Thunder Bay. Organizations included EcoSuperior, Lakehead University, Lakehead Region Conservation Authority, and Confederation College.
7. External funding will continue to be actively pursued to support updates to the Climate Adaptation Strategy this year.

8. Canada's National Adaptation Strategy was released in November 2022 and included the dedication of funds for municipal adaptation initiatives through the DMAF and the Federation of Canadian Municipalities Green Municipal Fund. These Federal commitments represent future opportunities for funding adaptation actions the City could access.
9. Grant applications are enabled by priority areas detailed in the City of Thunder Bay's Corporate Strategic Plan, with past applications supported through Climate Adaptation being explicitly listed as a Strategic plan priority. Grant applications for adaptation initiatives are additionally supported through references to actions listed in the Climate Adaptation Strategy.

Network & Collaborate: Investigate opportunities to increase the resiliency of the region through networks and strategic collaboration.

1. The City is participating in numerous networks and programs including, the Lake Superior Living Labs Network, the Risk Return on Investment Tool Municipal Advisory Committee, the Regional Public Works Commissioners of Ontario Climate Change Subcommittee, the Great Lakes Climate Adaptation Network, the ICLEI Advancing Adaptation program and ICLEI Building Adaptive and Resilient Communities.
2. The City continues to collaborate and network with other communities throughout Ontario and Canada. EarthCare has been invited to present on climate adaptation successes and lessons learned through conferences, webinars, and public gatherings.

Respond and Recover: Plan for efficient response and recovery to extreme weather events and disasters.

1. Municipal emergency exercises for 2021 and 2022 focused on climate impacts, preparing regional decision-makers to respond effectively to future events.
2. The Municipal Emergency Operations Control Group is in the process of updating the current Emergency Response Plan for the Corporation.
3. The Infrastructure and Operations Department reviewed and updated their departmental Emergency Response Plan.
4. The Thunder Bay COVID-19 Severe Weather Response Plan is in place for communication and coordination to support needs of vulnerable populations during severe weather events.

Climate Change Indicators

Twenty (20) key indicators continue to be collected to measure success and track how the City and community are preparing for, responding to, and recovering from priority climate change impacts. The 2021 indicators are the sixth set of data collected and are measured against the 2016 baseline year. The indicators were developed to illustrate trends, monitor impacts and track progress made on Adaptation Strategy goals.

Fewer weather-related events were experienced in 2016 to 2021 in comparison to previous years; as such the baseline data (in some cases, zero data) may be skewed. In addition, the COVID-19 pandemic directly impacted some of the indicators, such as internal and external engagement due to cancellation of in person events, as well as the evacuees hosted indicator, as requests for the city to host groups were initially denied due to capacity concerns during the pandemic response.

Indicators will continue to be collected over the long-term and will provide the ability to analyze trends and help to inform future decisions.

LINK TO EARTHCARE SUSTAINABILITY

This Report supports Goal 4 of the EarthCare Sustainability Plan 2014-2020 to “Build community resilience to reduce the risks inherent in climate change, and take advantage of opportunities for sustainable initiatives associated with current and future impacts of climate change” and is an outcome of Corporate Action 4.B.b. to “Develop a Climate Adaptation Strategy to support existing adaptive actions that build resilience and address vulnerabilities”.

FINANCIAL IMPLICATION

Climate impacts are a significant and growing financial risk to Canadian Municipalities. Severe weather events across Canada caused 1.9 billion a year in average annual insured losses between 2008 and 2018, compared to average annual insured losses of \$0.4 billion per year from 1983 to 2007 (inflation adjusted). Uninsured losses are estimated to be higher.

Canada’s National Adaptation Strategy estimates that every dollar invested in adaptation saves eight dollars in future costs.

CONCLUSION

The City of Thunder Bay continues work to adapt to the impacts of climate change. The costs of not investing in adaptation are significant; and affect infrastructure, social functioning, and public safety.

Work has included changes to policies, adaptations in infrastructure design, considerations in city planning, and ongoing community education and collaboration.

The City of Thunder Bay Climate Adaptation Strategy: Climate-Ready City guides adaptation efforts within the City, complementing the climate mitigation actions in the Net-Zero Strategy.

BACKGROUND

A Climate Emergency was declared by City Council in January 2020.

The City of Thunder Bay Climate Adaptation Strategy developed by EarthCare Thunder Bay was adopted by City Council in 2015, 184/2015 (Infrastructure and Operations).

A presentation on the progress of the development of the Climate Adaptation Strategy was presented to City Council on February 2, 2015.

A call to action to climate change adaptation from the Great Lakes and St. Lawrence Cities Initiative was answered by Mayor Keith Hobbs on April 16, 2014.

Climate adaptation was first recognized in the 2012 EarthCare Annual Report to Council.

REFERENCE MATERIAL ATTACHED

Attachment A: 2021 Climate Adaptation Indicators

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