Temperature Rising:
A Scoring Tool to Assess Extreme Heat Preparedness in Canadian Municipalities

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UNIVERSITY OF WATERLOO

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All findings and recommendations in this study are those of the Intact Centre on Climate Adaptation.

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About This Study

This Framework was made possible, in part, by the financial support of the Standards Council of Canada, as part of the Standards to Support Resilience in Infrastructure Program.

This study responds to the urgent need for action to address extreme heat in Canadian municipalities and better protect the health and well-being of residents. It was developed through a review of Canadian and international best practices and input from expert reviewers with experience in extreme heat research, policy, and on-the-ground action.

The scoring tool is designed to assess and quantify the state of municipal preparedness for extreme heat and identify initiatives that can reduce heat risk. It is intended to be practical, user-friendly, and freely available for use by municipalities and their partners, including public health authorities, social and community services, community-based and non-profit organizations, infrastructure partners, provincial and territorial governments, federal partners, the private sector, and employers.

Results from the tool can guide planning, investment, and collaboration to strengthen heat resilience across Canada, support public health authorities in developing or updating Climate Change and Health Vulnerability and Adaptation Assessments, including Heat Vulnerability and Adaptation Assessments, and advance progress under the Health Dimension of Canada's National Adaptation Strategy (2023).

Disclaimer

All dollar figures are in Canadian dollars.

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Executive Summary

Extreme heat is an increasingly urgent and potentially lethal climate risk facing residents and communities across Canada. As the climate warms, heat waves are becoming more frequent, longer, and intense. Canada is warming at approximately twice the global average, with Northern regions warming even faster. Extreme heat is already Canada's deadliest weather-related hazard even with **heat-related illness and death remaining substantially underreported.**

Municipalities are on the front lines of protecting residents from extreme heat. Although heat-related illness and death are largely preventable, some groups remain particularly vulnerable, including:

- **older adults;**
- **people with chronic illnesses;**
- **pregnant women;**
- **infants and young children;**
- **individuals living alone;**
- **residents with limited or no access to cooling;**
- **outdoor workers;**
- **low-income individuals; and**
- **individuals experiencing homelessness.**

The 2021 heat dome in British Columbia, which resulted in 619 heat-related deaths, demonstrated the consequences of inadequate preparedness. Had this event coincided with prolonged power outages, heat-related mortality could have more than doubled, particularly for residents who rely on air conditioning, mechanical ventilation, elevators, or other building systems to remain safe indoors.

Climate projections indicate that extreme heat will increase substantially across Canada over the coming decades. **By mid- to late-century, under a low-emissions scenario, many Canadian cities are projected to experience at least two to three times as many days above 30°C per year, on average, compared with historical conditions.** In parts of Canada, heat waves are also projected to occur more often, last longer, and extend from late spring into early fall. These changes will increase the need for municipalities to prepare for longer and more complex periods of heat risk.

In anticipation of increasing extreme heat risk across Canada, the Intact Centre on Climate Adaptation has developed an **Extreme Heat Preparedness Scoring Tool**.

This tool is designed to help medium- to large-sized Canadian municipalities (more than 50,000 residents), and their partners (e.g., public health authorities, community-based groups, social service agencies), to assess and quantify preparedness to manage extreme heat, and to take action to limit exposure.

For smaller communities, the tool can provide guidance to ensure basic heat preparedness measures are in place (e.g., checking on elderly who live alone).

Extreme heat responsibilities are often distributed across municipal departments and external partners, making it difficult to understand overall readiness or identify priority gaps. The scoring tool addresses this challenge by providing a **structured assessment framework that translates complex, multi-sectoral efforts into a clear picture of heat preparedness**.

The tool is organized into **eight assessment categories**, each with criteria and a scoring framework to evaluate municipal preparedness. The categories reflect best practices drawn from heat adaptation literature, municipal experience, and expert guidance from heat specialists. Together, these categories span the major components of municipal heat risk management.

1. Governance

Assesses leadership, coordination, funding, partnerships, data sharing, and accountability for sustained heat risk reduction.

2. Assessing Extreme Heat Health Risk

Examines understanding of heat exposure, susceptible populations, and local actions to reduce heat-related illness and death.

3. Heat Alerts, Communication, and Municipal Employee Protocols

Evaluates heat warning communication, public heat-health guidance, and protocols to protect municipal employees.

4. Community Mobilization and Response

Considers pre-season coordination and response measures that protect susceptible populations during extreme heat events.

5. Green Infrastructure

Considers the use of urban forestry and green infrastructure to reduce heat, manage stormwater, and support equitable resilience.

6. Existing Buildings

Assesses actions to reduce indoor heat risk in existing buildings, including cooling, resident protections, long-term care, backup power and alignment with Health Canada's 26˚C upper indoor temperature guidance.

7. New Buildings and Properties

Evaluates whether new development is designed to reduce overheating, outdoor heat accumulation, and future heat vulnerability.

8. Urban Design

Assesses how planning, streets, parks, shade, greenspace, and development controls reduce heat exposure in outdoor spaces.

The scoring framework was developed through a collaborative process. The categories and criteria were informed through a structured review of municipal climate adaptation and heat action plans from Canada and comparable international jurisdictions, and best-practice guidance on heat adaptation. **More than 80 subject-matter experts from more than 45 organizations** contributed to development of the tool and beta testing. This process strengthened the tool's rigour, usability, and practical relevance.

Each assessment question utilizes predefined criteria to enable municipalities and partners to calculate preparedness scores, benchmark progress over time, and identify where policy, funding, or capacity supports are needed.

The next stage of this work will apply the scoring tool to assess the extreme heat preparedness of 30 of Canada's largest cities. This assessment will generate comparable preparedness scores, identify areas of strength and opportunities for improvement, and provide a practical roadmap to help municipalities and their partners prioritize actions that reduce heat risk for residents.

In an era of rapidly intensifying heat risk, this tool offers Canadian municipalities and their partners a practical way to move from awareness to action—supporting proactive, equitable, and coordinated efforts to reduce extreme heat risk, protect health, and save lives.

Introduction

1

1.1 Extreme Heat Risks to Life and Health and the Need for Urgent Action

Extreme heat is recognized as one of the most urgent climate risks facing communities across Canada (ECCC, 2023). It is often called the "**silent killer**" because it can cause severe health impacts without the visible physical damage typically associated with floods, storms, or wildfires. Extreme heat has already caused preventable illness and death, strained health and emergency systems, and exposed weaknesses in housing, infrastructure, and social supports. **While communities cannot prevent near-term increases in extreme heat driven by climate change, they can reduce harm through preparedness, planning, and targeted adaptation.**

Extreme heat refers to unusually high temperatures relative to local seasonal norms, often lasting several days and sometimes combined with high humidity and limited overnight cooling (Environment and Natural Resources, 2026). In Canada, heat warnings are issued when region-specific temperature thresholds are reached for two or more consecutive days and nighttime temperatures remain elevated, providing little relief from heat stress (ECCC, 2025; Environment and Natural Resources, 2026).

Climate change is driving more frequent, severe, and intense extreme heat events, contributing to rising heat-related illness and mortality worldwide (IPCC, 2022). **As global temperatures continue to increase, the frequency and severity of heat events will intensify, with much of this warming already locked in on near- to mid-term timescales** (Figure 1) (climateatlas.ca, n.d.; ECCC, 2019; IPCC, 2021).

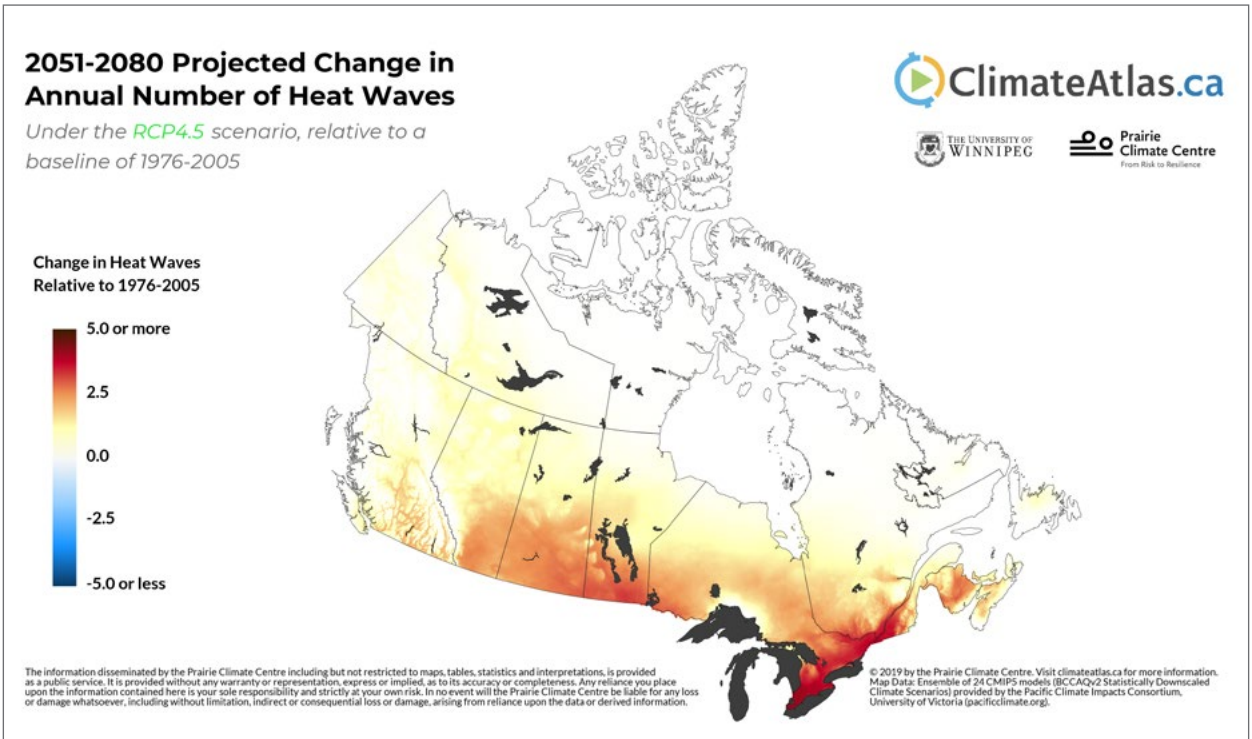


Figure 1: 2051-2080 projected change in annual number of heat waves, under RCP4.5 scenario, relative to a baseline of 1976-2005 (Source: climateatlas.ca)

Extreme heat presents a particular challenge for Canada's cities and towns because urban areas can intensify heat exposure (Eyquem and Feltmate, 2022). Buildings, roads, parking lots, and other hard surfaces absorb and retain heat, contributing to the **urban heat island effect**. These conditions increase outdoor heat exposure, reduce nighttime cooling, and can make it more difficult for buildings to cool down during heat events.

Indoor overheating is also an increasing health concern. Health Canada now recommends an upper indoor temperature limit of 26˚C to protect older adults from heat-related illness and death, noting that sustained exposure to indoor temperatures between 26˚C and 31˚C, especially overnight, should be avoided whenever possible (Health Canada, 2026).

Extreme heat is Canada's deadliest weather-related hazard, responsible for more illness and fatalities than all other extreme weather events combined (Health Canada, 2024, 2025). Exposure to extreme heat can cause dehydration, heat cramps, heat exhaustion, and heat stroke, and can worsen underlying cardiovascular, respiratory, renal, metabolic, and mental health conditions, increasing the risk of hospitalization or death (Ebi et al., 2021a). Heat-related illness and mortality are also widely underreported, meaning the true health burden is likely greater than documented (Health Canada, 2025; Vicedo-Cabrera et al., 2021).

Recent heat events demonstrate the substantial human toll of heat in Canada. The 2021 British Columbia heat dome resulted in 619 heat-related deaths (BC Coroners Service, 2022). Earlier events also caused significant mortality, including approximately 110 heat-related deaths in British Columbia in 2009 and an estimated 280 and 86 deaths during Quebec heat waves in 2010 and 2018, respectively (Bustinza et al., 2013; Henderson et al., 2022a; Lebel et al., 2019).

Evidence from 12 of Canada's largest cities found significantly elevated mortality during extreme heat events in most cities, further demonstrating that urban Canada faces a serious public health risk (Quick, 2024).

These risks are not evenly distributed across communities and reducing them requires local action that identifies who is most at risk, where exposure is greatest, and which protective measures can be implemented before, during, and after heat events.

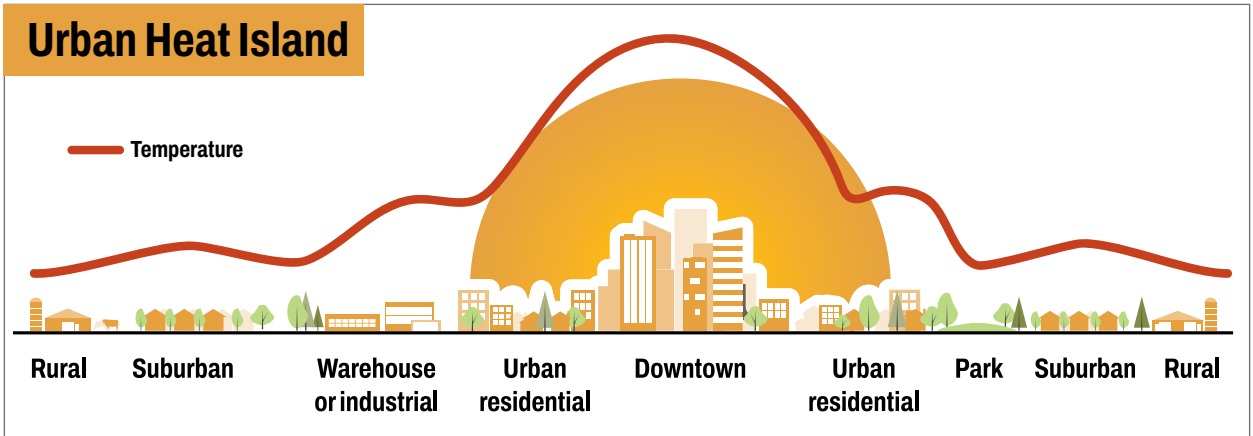


Figure 2: Urban heat island effect, showing higher temperatures in densely built areas and lower temperatures in greener suburban and rural areas.

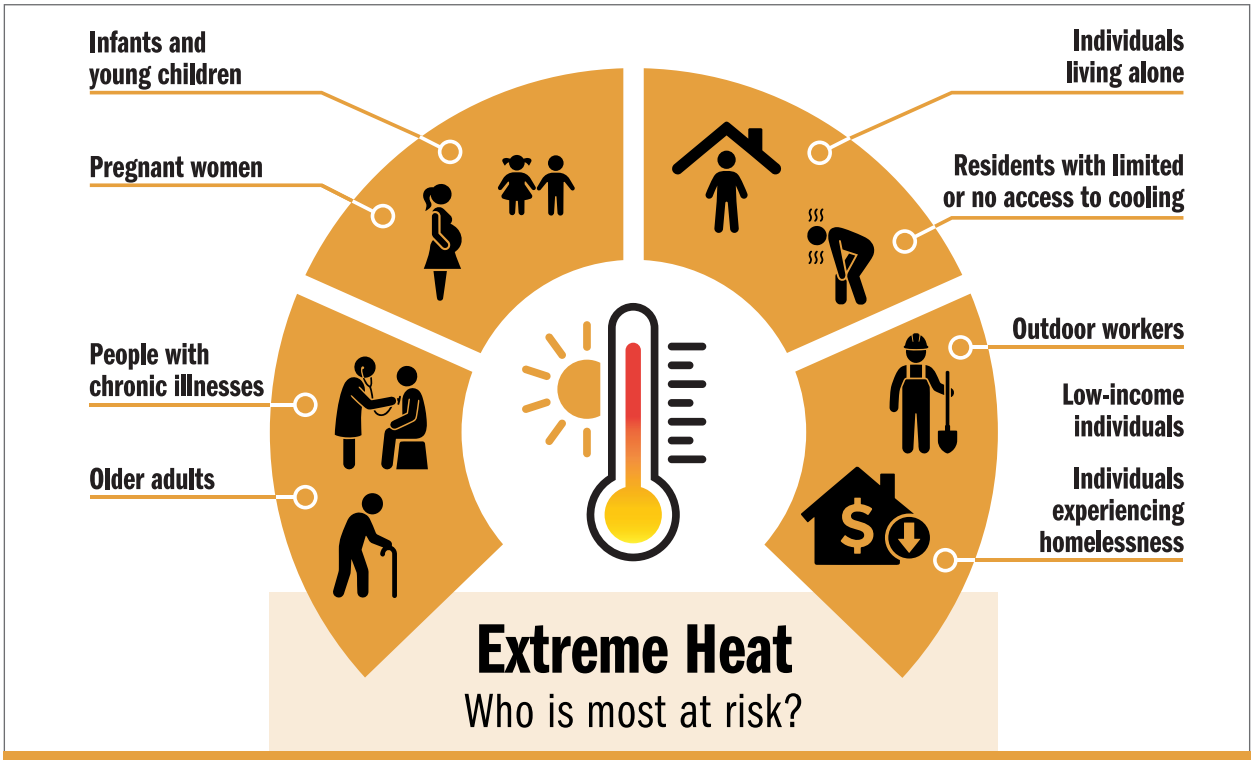
1.2 Municipalities on the Front Lines

As temperatures rise and heat waves become more frequent, longer, and more intense, **municipalities are on the front lines of protecting residents.**

Extreme heat is manageable and heat-related illness and death can be prevented. However, extreme heat remains a major public health challenge, affecting communities differently and placing disproportionate strain on people who are most vulnerable.

Extreme heat can affect everyone; however, certain groups face significantly higher risk of heat-related illnesses, including:

- older adults;
- people with chronic illnesses;
- pregnant women;
- infants and young children;
- individuals living alone;
- residents with limited or no access to cooling;
- outdoor workers;
- low-income individuals; and
- individuals experiencing homelessness (Ebi et al., 2021a).



Source: Adapted from a Beat the Heat graphic (LinkedIn post, 2025). Illustration redrawn and redesigned by the Intact Centre on Climate Adaptation.

Even people with access to mechanical cooling, such as air conditioners or heat pumps, can become vulnerable during extended power outages (Stone et al., 2023). **Without proactive, protective action, extreme heat can threaten health and well-being and deepen existing social and health inequities.**

Protecting residents from extreme heat is a shared responsibility. Municipalities play a central role in reducing heat risk through:

- planning;
- urban and infrastructure design;
- public communication;
- heat response during heat waves, such as activating heat alerts, opening cooling centres, splash pads, and pools, conducting targeted outreach to susceptible populations; and
- long-term heat risk reductions, such as upgrading buildings and housing, and strengthening social networks.

While governance and collaboration across municipal departments are essential, municipalities cannot address this challenge alone. Effective protection from extreme heat requires a **whole-of-society approach**, with coordinated action across governments, public health authorities, community-based organizations, social service agencies, housing providers, the private sector, and residents. This includes:

- **Federal and provincial/territorial governments:** supporting local action through policies, funding, and technical guidance that strengthens municipal capacity.
- **Public health authorities, community-based groups, social service agencies, and housing providers:** helping to assess risk and design and deliver adaptation interventions that reach susceptible populations and reflect local needs.
- **The private sector:** supporting short-term heat response, such as offering cooling spaces, protecting outdoor workers, and amplifying heat-alert communication, while investing in long-term resilience through building retrofits, green infrastructure, grid reliability, and collaborative planning.

As municipalities increasingly recognize extreme heat as a growing and complex risk, action is required across a wide range of policy areas, from emergency response and public health to land-use planning and urban design. However, responsibilities are often distributed across departments and partners, and actions may be implemented incrementally or in isolation, making it difficult to understand overall preparedness or identify priority gaps. **This creates a need for a practical, consistent assessment approach that helps municipalities and their partners take stock of current efforts, identify gaps, and prioritize action.**

26°C

The recommended upper indoor temperature limit from Health Canada.

1.3 Purpose and Value of a Scoring-Based Assessment

This report presents a scoring tool to assess and quantify the state of preparedness of medium- to large-sized Canadian municipalities to limit extreme heat risk.

The tool is designed to help municipalities and their partners understand their current level of readiness, identify areas of strength and opportunities for improvement, and support informed decision-making.

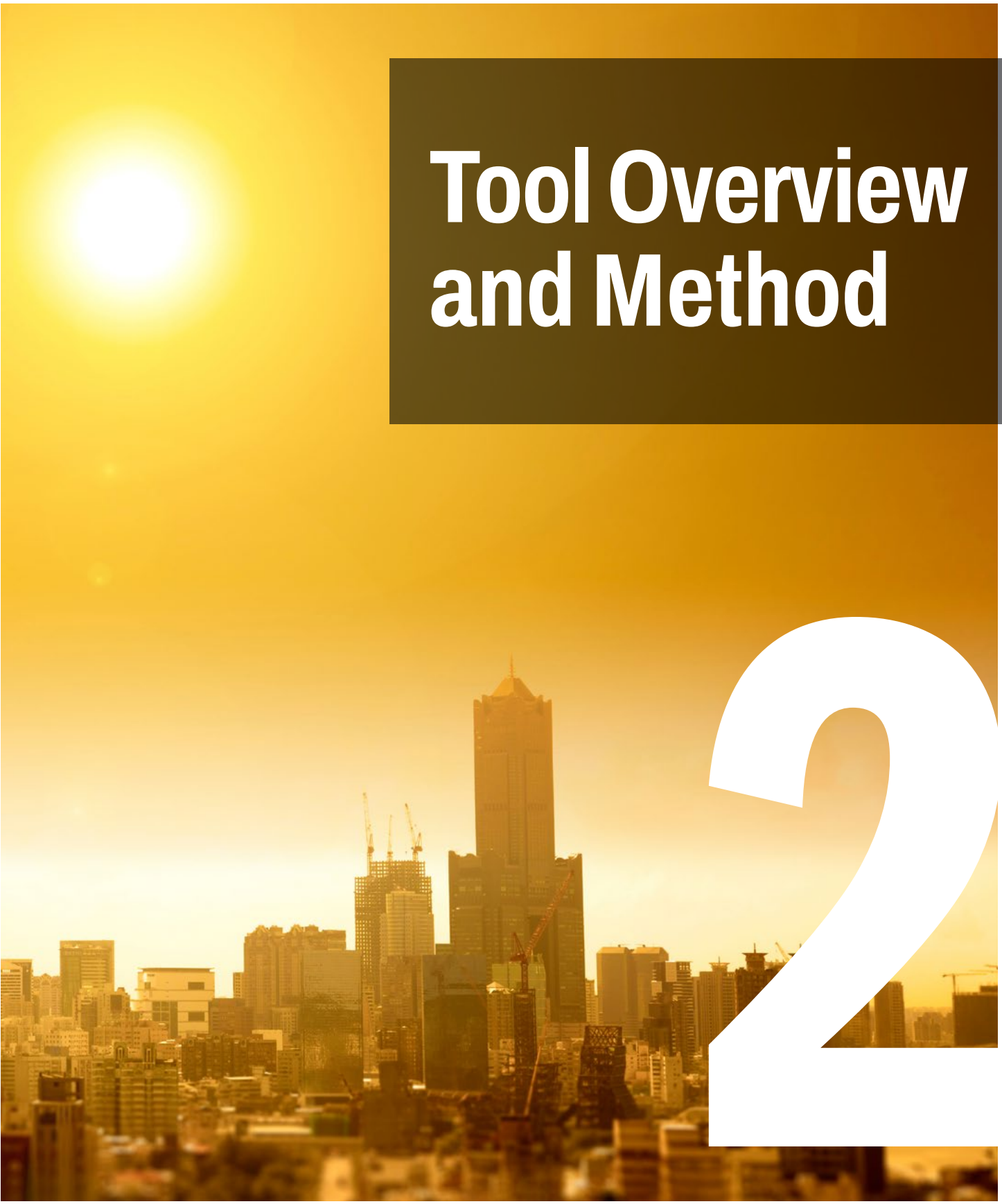
Taking action and strengthening existing initiatives requires a clear understand of the adaptation measures available, and the extent to which those measures are already in place. This includes identifying where progress is underway, where protective measures are being implemented, and where additional effort, investment, or coordination may be needed.

Given the breadth of partners and sectors involved, and the varying levels of maturity across different initiatives, **municipalities need a practical, standardized method to take stock of their efforts in a consistent and comprehensive manner**. A scoring-based assessment can support this process by translating complex, multi-sectoral actions into a clear picture of preparedness, highlighting strengths, identifying gaps, and enabling comparisons over time. It can also support dialogue across departments and with external partners, providing a shared foundation for planning, investment, and implementation.

1.4 Definition of Key Terms

This report and scoring tool use technical, heat policy, and adaptation-related terms. Definitions of key terms are provided in the Appendix.

Tool Overview and Method



2

2.1 Overview of Extreme Heat Preparedness Scoring Tool

This scoring tool is designed to help municipalities and their partners better prepare for extreme heat and reduce risk to residents. It builds on the findings of the Intact Centre on Climate Adaptation's 2022 report, Irreversible Extreme Heat: Protecting Canadians and Communities from a Lethal Future, which found that many major Canadian cities are already exposed to potentially lethal extreme heat and will face steadily increasing heat risk by 2050.

While the need for action is apparent, the extent to which Canadian municipalities are recognizing and addressing extreme heat risk remains unclear. Some municipalities and their external partners—including public health authorities, community-based groups, social service agencies, housing providers, federal and provincial/territorial governments, and the private sector—may already be aware of the risks they face and have begun implementing measures to protect residents, while others may be at a much earlier stage of understanding and action.

This scoring tool enables municipalities and partners to assess and quantify their current level of preparedness for extreme heat. By evaluating key dimensions ranging from governance and risk assessment to community response, green infrastructure, buildings, and urban design, the tool provides a structured way to identify areas of progress and gaps in greater detail and begin prioritizing measures to strengthen heat resilience. **The goal is to establish a clear benchmark of current readiness and motivate additional action that improves heat resilience.**

2.2 Applicability

The scoring tool is best suited for **medium- to large-sized municipalities**, with more than 50,000 residents, where the technical and administrative capacity, data availability, and cross-sector coordination required for comprehensive heat risk reduction are more likely to be present.

This population threshold is broadly consistent with Statistics Canada's population centre classifications, which define medium population centres as 30,000 to 99,999 residents and large urban centres as 100,000 or more residents (Statistics Canada, 2022). The greater than 50,000 threshold reflects the level of municipal capacity generally needed to coordinate across public health, emergency management, land-use planning, infrastructure, communications, community organizations, and external partners.

Research shows that smaller and less-resourced municipalities often face structural constraints that limit their ability to undertake comprehensive, multi-indicator adaptation assessments. These constraints include limited staff capacity, financial resources, data availability, and analytical capacity (Bausch & Koziol, 2020; Fila & Fünfgeld, 2023; Fila et al., 2024). Larger jurisdictions are more likely to have the systems needed for heat preparedness, including heat action plans, vulnerability assessments, surveillance and evaluation mechanisms, and cross-sector coordination, although implementation can remain uneven even in large cities (Errett et al., 2023; Randazza et al., 2023; Simpson et al., 2026).

619

Heat-related deaths occurred during the 2021 British Columbia heat dome.

Smaller municipalities and rural communities will find value in the tool as a structured reference for learning, priority-setting, and engagement. Many of the assessment categories and questions reflect broadly applicable heat adaptation interventions, governance approaches, and partnership models. However, where technical capacity is limited, data are unavailable, or actions are informal, a composite preparedness score may not accurately reflect local progress. Future work could build on this tool to develop a complementary framework tailored to small municipalities and rural communities.

2.3 Scoring Tool Structure

This scoring tool is organized into a set of categories and corresponding assessment questions that evaluate the extent to which municipalities and their partners are prepared to reduce extreme heat risk for residents.

There are eight categories:

1. Governance
2. Assessing Extreme Heat Health Risk
3. Heat Alerts, Communication, and Municipal Employee Protocols
4. Community Mobilization and Response
5. Green Infrastructure
6. Existing Buildings
7. New Buildings and Properties
8. Urban Design

Detailed descriptions of the eight categories are presented below. The rationale and methodology for their selection are outlined in Section 2.4.

1. Governance

Heat governance refers to the coordinated functioning of actors, institutions, and assets across multiple timescales, from early warning and emergency response to seasonal preparedness and long-term risk reduction. Core functions include cross-sector planning, clear roles and responsibilities, data integration, learning, and accountability (UNDRR et al., 2025b).

Governance is foundational to extreme heat preparedness because heat risk spans multiple sectors, including public health, emergency management, land-use planning, housing, infrastructure, labour protection, community services, and energy systems (UNDRR, 2025a). Effective heat risk reduction requires mechanisms that align actors, mandates, resources, and investments before heat events occur (UNDRR et al., 2025b). Without these mechanisms, municipalities may remain focused on short-term emergency response, rather than reducing underlying exposure and vulnerability.

Governance shortcomings, including fragmented policies, reactive crisis response, unclear leadership, and weak data integration, are among the most persistent barriers to effective heat risk reduction (UNDRR et al., 2025a; UNDRR et al., 2025b). Heat action plans, vulnerability assessments, and early warning systems are only effective when embedded in governance arrangements that enable coordination, continuity, and performance improvement over time.

Including governance as an assessment category allows the tool to distinguish between municipalities with some heat-related activities and those with the organizational capacity to sustain, coordinate, and scale equitable heat risk reduction over time (UNDRR, 2025b).

2.

Assessing Extreme Heat Health Risk

Assessing extreme heat health risk is foundational to effective planning, response, and mitigation. To protect residents and strengthen heat resilience, municipalities and their partners need to understand how heat is experienced across the community. This includes examining outdoor temperature patterns, identifying neighbourhoods with elevated heat exposure, and assessing where susceptible populations are concentrated and where the risk of heat-related illness and death is greatest (Health Canada, 2011).

This assessment is particularly important because **extreme heat does not affect all populations equally**. Some groups are physiologically more vulnerable, including pregnant women, young children, older adults, and people with pre-existing chronic conditions. Others face heightened risk due to social or material circumstances that increase exposure, limit protective action, or restrict access to cool spaces, including people who are unhoused, people living on low incomes, newcomers, people who are socially isolated or have mobility challenges, and those who work outdoors or in hot indoor environments (INSPQ, 2021).

The consequences of failing to assess heat risk are well documented. During the 2021 heat dome in British Columbia, mortality rates were much higher among older people and people living on low incomes, underscoring how heat interacts with existing inequities to produce unequal outcomes (Henderson et al., 2022b).

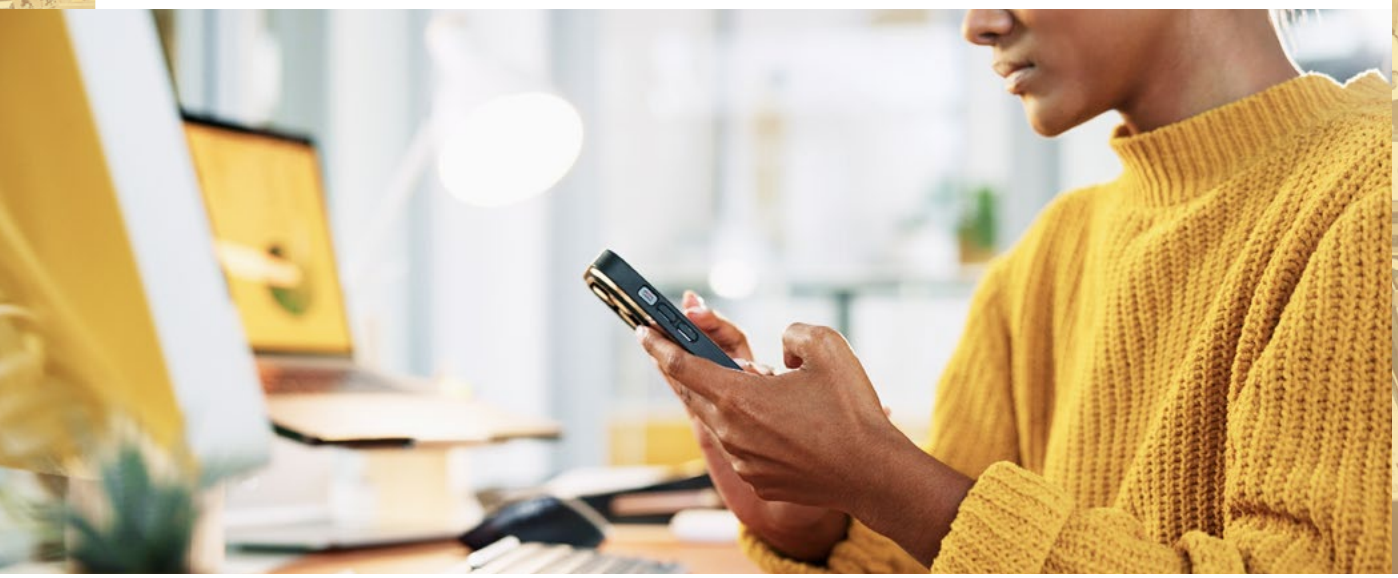
3.

Heat Alerts, Communication, and Municipal Employee Protocols

Heat alerts and effective communication are foundational components of municipal extreme heat preparedness. In Canada, Environment and Climate Change Canada, in collaboration with provincial and territorial governments, uses region-specific heat warning thresholds that reflect local climate conditions and population acclimatization (Goulding and Loftus, 2025).

Because heat-related health outcomes are strongly influenced by timely warnings, behavioural responses, and adaptive actions, municipalities and public health agencies play a critical role in communicating clear, actionable information about heat-health risks, populations at greatest risk, and protective measures that individuals, caregivers, employers, and organizations can take to reduce harm (Ebi et al., 2021b; Health Canada, 2011; INSPQ, 2021). **When well designed and targeted, heat alert and communication systems can increase risk awareness, prompt protective behaviours, support outreach to susceptible populations, and activate coordinated community and service-provider responses.**

This category assesses whether municipalities receive and communicate heat warnings effectively, provide accessible and targeted heat-health guidance to residents and partners (for example, see Figure 3 on page 24), and protect municipal employees through heat protocols and training. These elements are important indicators of municipal readiness to reduce heat-related illness and death.



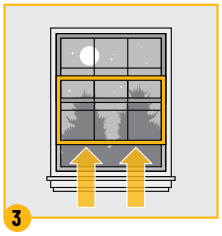
Three Steps to Cost-Effective Home Heat Protection

Step 1: Plan ahead to keep cool

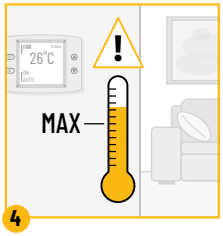
Do-it-yourself, $0

1. Help vulnerable neighbours, family, friends prepare and arrange to check on them during heat events.

2. Sign up for heat alerts on your phone (e.g., WeatherCan, Alertable).



3. Improve indoor air circulation with portable or ceiling fans, and naturally ventilate your home by opening windows and doors, particularly at night.

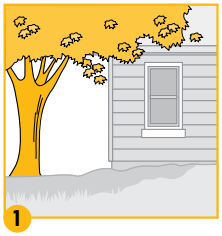


4. Monitor indoor temperature to protect residents from unsafe heat.

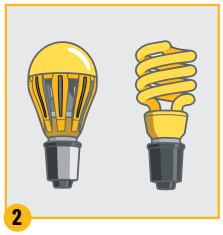
5. Temporarily arrange to work or sleep in cooler rooms (e.g. basement).

Step 2: Complete simple upgrades

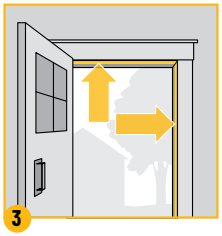
Do-it-yourself, for under $500



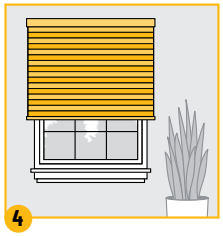
1. Plant and maintain shade trees, especially along south, east and west facing walls.*



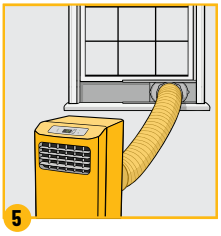
2. Choose energy efficient lights that produce less "waste" heat.



3. Improve home insulation and air tightness (e.g., draft strips).



4. Install blinds, heat-resistant curtains, or films on windows.

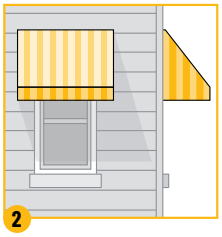


5. Use a portable AC to help increase air circulation.

Step 3: Complete more complex upgrades

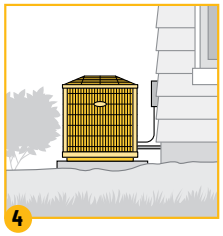
Work with a contractor, for over $500

1. Convert paved areas to vegetation which absorbs less heat and more water.*

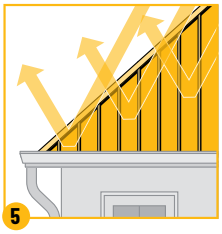


2. Shade windows with outdoor shutters and awnings.

3. Install windows and doors that have a low Solar Heat Gain Coefficient (let less heat in).



4. Install and maintain a heat pump or air conditioning unit.



5. Apply cool roof coatings and use infrared-reflective paint on sun-exposed exterior walls.

* Seek local advice on appropriate native species, and, in places at risk of wildfire, consider FireSmart™ guidance.

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Scan the code or click the link for additional resources at www.intactcentre.ca

Figure 3: Three Steps to Cost-Effective Home Heat Protection. (Intact Centre on Climate Adaptation, n.d.)

4. Community Mobilization and Response

Community mobilization refers to the proactive, pre-season activities undertaken to prepare communities for extreme heat events and to strengthen the networks needed for effective response. This includes building awareness of heat-related health risks, engaging and coordinating community organizations, training frontline staff and volunteers, and establishing protocols that can be rapidly activated during heat events.

Community response refers to actions taken during extreme heat events to reduce exposure and protect health, particularly for populations at greatest risk. These actions may include:

- opening and staffing cooling spaces;
- extending access to pools, splash pads, and other public cooling amenities;
- distributing water, cooling supplies, and heat-health information;
- conducting proactive outreach or heat check-ins; and
- coordinating services through community-based organizations, social service providers, and public health agencies.

When timely, targeted, and well-coordinated, these measures can reduce heat-related illness and death, especially among older adults, socially isolated people, and others who may face barriers to accessing cooling independently (Bassil & Cole, 2010; Toloo et al., 2013).

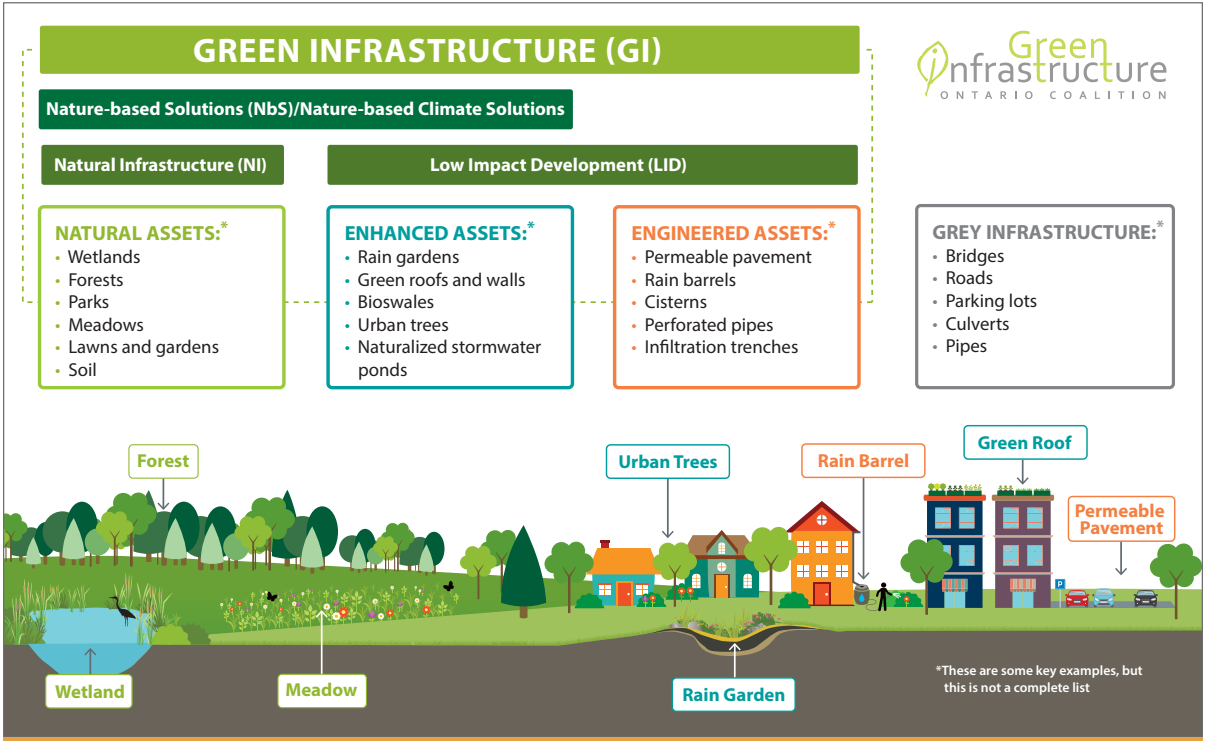
Including community mobilization and response as an assessment category recognizes that heat outcomes depend on local capacity to translate warnings into protective action. Municipalities that invest in sustained community partnerships and coordinated response mechanisms are better positioned to support high-risk populations, adapt interventions to local needs, and respond effectively as conditions escalate.

5.

Green Infrastructure

Green infrastructure refers to networks of natural and semi-natural features integrated into the built environment, including urban forests, parks, green roofs and walls, tree-lined streets, bioswales, rain gardens, and permeable pavements. Unlike conventional grey infrastructure, green infrastructure uses vegetation, soil, and natural processes to provide environmental and social benefits, including stormwater management, cooling, air quality improvement, biodiversity, and more livable public spaces (Health Canada, 2020b).

Green infrastructure is a key strategy for reducing heat risk in cities because it mitigates the urban heat island effect through shading, evapotranspiration, and the replacement of heat-absorbing surfaces such as asphalt and concrete. These measures can reduce ambient and surface temperatures, lowering both outdoor and indoor heat exposure. This is particularly important in dense neighbourhoods, where urban heat islands can sustain elevated temperatures, especially at night when cooling is critical for human health (Health Canada, 2020b; Seltenrich, 2023; Tong et al., 2021).



Source: Adapted from Green Infrastructure Ontario Coalition, What Is Green Infrastructure? infographic (2021).

5. Green Infrastructure (continued)

Green infrastructure also provides long-term, multifunctional benefits beyond heat reduction. Greening measures have been associated with improved mental health, reduced stress, healthier birth outcomes, and lower rates of premature mortality (Crouse et al., 2017; Gascon et al., 2016; Markevych et al., 2017). **By prioritizing green infrastructure investments in neighbourhoods with high heat exposure and higher concentrations of heat-vulnerable populations, municipalities can reduce risk while advancing health equity** (Ebi et al., 2021b).

In communities exposed to wildfire risk, urban forestry, green infrastructure, and vegetation-based shading measures should be designed, located, and maintained to reduce heat without increasing wildfire risk. Plant selection, density, spacing, proximity to buildings, pruning, and the management of dead or combustible vegetation should align with FireSmart™ guidance and local wildfire risk assessments.

Including green infrastructure as an assessment category recognizes the role of urban forests, parks, permeable surfaces, and other nature-based measures in creating durable, health-protective, and climate-resilient urban environments.

6. Existing Buildings

Retrofitting existing buildings for heat resilience involves modifying the current building stock to reduce indoor peak temperatures, limit dangerous overheating, maintain safer conditions during hot days and nights, and prevent cascading risks during power outages. Retrofits can include **passive measures**, such as improved roof and wall insulation, reflective or cool roof coatings, window shading and awnings, and enhanced natural ventilation, as well as **active measures** such as efficient mechanical cooling systems and reliable backup power.

Recent extreme heat events have shown that building design, materials, and operation are critical determinants of indoor temperatures. During the 2021 British Columbia heat dome, indoor temperatures in many homes reached an estimated 30˚C to 40˚C, as outdoor temperatures remained high at night, buildings were not designed for sustained heat, and air conditioning was limited in the greater Vancouver area (Henderson et al., 2022b). The same event demonstrated the lethal consequences of unsafe indoor heat: 98% of the 619 heat-related deaths occurred inside homes, with higher death rates among low-income populations and in homes that lacked air conditioning (BC Coroners Service, 2022; Henderson et al., 2022b).

Both passive and active cooling measures should be considered for existing buildings. Following the BC heat dome, the Chief Coroner of British Columbia recommended that retrofit programs include both passive and active cooling measures, with rebates targeted to low-income households and the least energy-efficient residential building stock (BC Coroners Service, 2022). Passive cooling can moderate indoor temperatures, reduce reliance on mechanical cooling, and provide baseline protection during power outages.

Power outages during extreme heat can create compounded risks, particularly for people living in multi-unit residential buildings (MURBs). During a prolonged outage, residents may lose mechanical ventilation, air conditioning, running water, and elevator access, creating dangerous conditions for people who cannot use stairs. Modelling research suggests that heat-related mortality can more than double when a multiday blackout coincides with heat wave conditions (Stone et al., 2023).

While building codes and standards generally address backup power for emergency evacuation, they often do not address the need to protect occupants from extreme heat during prolonged outages. Toronto's voluntary Minimum Backup Power Guidelines for MURBs, introduced in 2016, provide one example of how municipalities can begin to address this gap by identifying backup systems needed to support occupants during extended outages (City of Toronto, 2016).

6. Existing Buildings (continued)

Preparedness for extreme heat should also address unsafe indoor temperatures in existing housing.

In Canada, minimum indoor temperature standards exist for cold, but there are generally no equivalent maximum indoor temperature requirements to protect residents from extreme heat (Chief Public Health Officer of Canada, 2022).

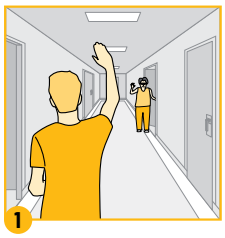
Health Canada now recommends an upper indoor temperature limit of 26˚C to protect older adults from heat-related illness and death, framing this threshold as a health-protective action level rather than a comfort target (Health Canada, 2026). However, in the absence of national indoor temperature requirements, some municipalities have begun acting independently through landlord education (for example, see Figure 4 on page 30), tenant protection measures, and maximum indoor temperature bylaws. For example, the City of New Westminster, BC, has adopted bylaws requiring landlords to maintain at least one room at or below 26˚C overnight during summer months (Vanderdeen, 2026).

Including existing buildings as an assessment category recognizes that indoor conditions are a major determinant of heat-related illness and death. Assessing building retrofits, access to cooling, tenant protections, long-term care requirements, and backup power provides insight into whether existing buildings can maintain safer conditions during extreme heat and protect residents at greatest risk.

Three Steps to Cost-Effective Apartment and Condo Heat Protection

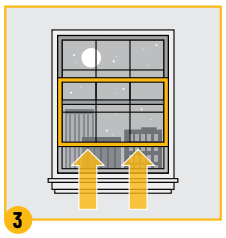
Step 1: Plan ahead to keep cool

Do-it-yourself, $0-$100

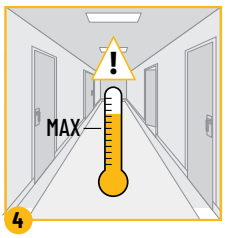


1 Help vulnerable neighbours, family, friends prepare and arrange to check on them during heat events.

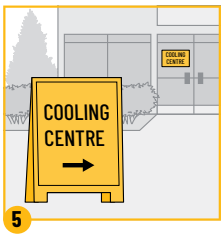
2 Sign up for heat alerts on your phone (e.g., WeatherCan, Alertable).



3 Improve indoor air circulation with portable or ceiling fans, and naturally ventilate your unit by opening windows and doors, particularly at night.



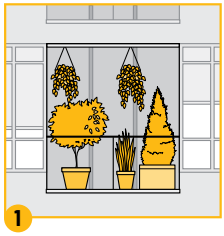
4 Monitor indoor temperature to protect residents from unsafe heat.



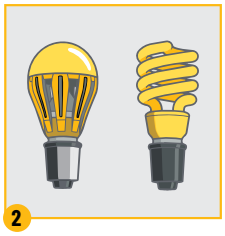
5 Arrange to spend time in a cooler space (e.g., shared cooling space).

Step 2: Complete simple upgrades

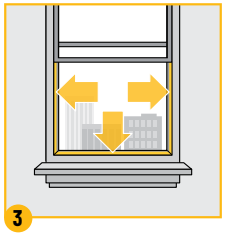
Do-it-yourself, for under $500



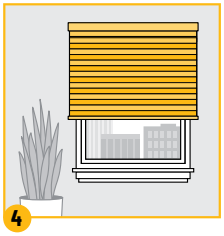
1 Green your balcony or deck with potted, hanging and climbing plants.*



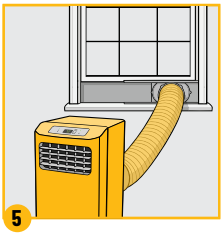
2 Choose energy efficient lights that produce less "waste" heat.



3 Improve unit insulation and air tightness (e.g., draft strips).



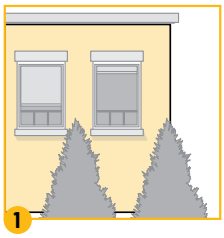
4 Install blinds, heat-resistant curtains, or films on windows.



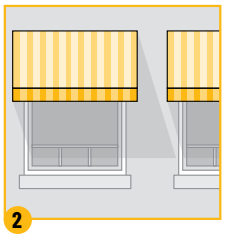
5 Use a portable AC to help increase air circulation.

Step 3: Complete more complex upgrades

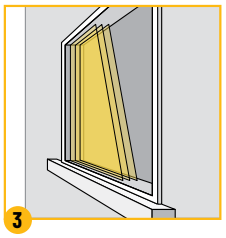
With building managers, for over $500



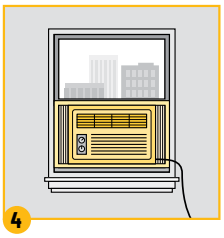
1 Paint unit walls with white paint or light colours.



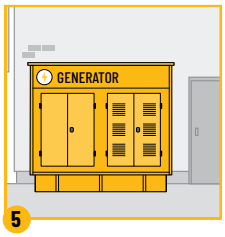
2 Shade windows with outdoor shutters and awnings.



3 Install windows and doors with low Solar Heat Gain Coefficients, that let less heat in.



4 Install and maintain a heat pump or air conditioning unit.



5 Plan for back-up power, with adequate fuel supply, during outages in multi-unit buildings and critical facilities.

* In places at risk of wildfire, the use of green infrastructure must be considered alongside FireSmart™ guidance.

Note: For any upgrades, check with your landlord or strata.

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Scan the code or click the link for additional resources at www.intactcentre.ca

Figure 4: Three Steps to Cost-Effective Apartment and Condo Heat Protection. (Intact Centre on Climate Adaptation, n.d.)

7. New Buildings and Properties

The design and layout of new buildings and properties play a critical role in shaping long-term heat exposure and vulnerability within cities. **Decisions made at the development stage**, such as building orientation, materials, façade design, ventilation strategies, shading, tree canopy preservation, and surface permeability, **directly influence how much heat is absorbed, stored, and released into surrounding areas and indoor spaces** (Almashhour & Alzaatreh, 2025; Health Canada, 2020b; Oke, 1982).

New buildings and properties are one of the strongest leverage points municipalities have to reduce future heat risk because they lock in physical conditions for decades. Poorly designed developments can create long-term heat burdens that require costly retrofits or ongoing emergency interventions, while heat-resilient design can provide durable protection at relatively low incremental cost when incorporated early (Hayes et al., 2022; Health Canada, 2020b; Oke, 1982).

Heat-resilient design can reduce indoor overheating and outdoor heat accumulation through measures such as:

- exterior solar shading,
- high-performance building envelopes,
- green or cool roofs,
- natural ventilation,
- reflective or permeable surfaces, and
- tree planting.

High-efficiency mechanical systems, such as heat pumps, can also provide cooling while improving energy efficiency and reducing emissions. Together, these measures can reduce reliance on mechanical cooling, limit peak electricity demand during heat waves, and help prevent future heat vulnerability as urban areas grow and densify.

Including new buildings and properties as an assessment category recognizes that preparedness for extreme heat depends not only on managing existing risks, but also on avoiding the creation of new ones. Assessing how heat-resilient design is regulated, guided, and incentivized provides insight into whether future development will increase or reduce heat vulnerability.

8. Urban Design

Urban design refers to the physical layout and spatial organization of buildings, streets, public spaces, and landscapes, and how these elements shape environmental conditions and human experience. It includes factors such as:

- street orientation and width,
- building height and spacing,
- surface materials,
- tree canopy and green space distribution,
- access to shade, and
- the presence of water features.

Together, these design decisions influence local air and surface temperatures, wind flow, solar exposure, and the accumulation or dissipation of heat at neighbourhood and city scales (Health Canada, 2020b; Johansson, 2006; Oke, 1982; Oke, 1988).

Urban design can either amplify or reduce the urban heat island effect. Dense concentrations of heat-absorbing materials, limited vegetation, wide unshaded streets, and constrained airflow can trap heat during the day and limit nighttime cooling, increasing outdoor and indoor heat exposure. In contrast, heat-responsive urban design strategies, such as well-distributed tree canopy, connected green spaces, shaded pedestrian networks, permeable and reflective surfaces, and street layouts that support ventilation, can reduce radiant heat, lower ambient temperatures, and improve thermal comfort (Oke, 1988; Johansson, 2006; Chen et al., 2024; Turner et al., 2023). These measures reduce health risks during extreme heat events and support safer mobility, social interaction, and access to cooling in public spaces (Health Canada, 2020b; Turner et al., 2023; WHO, 2016).

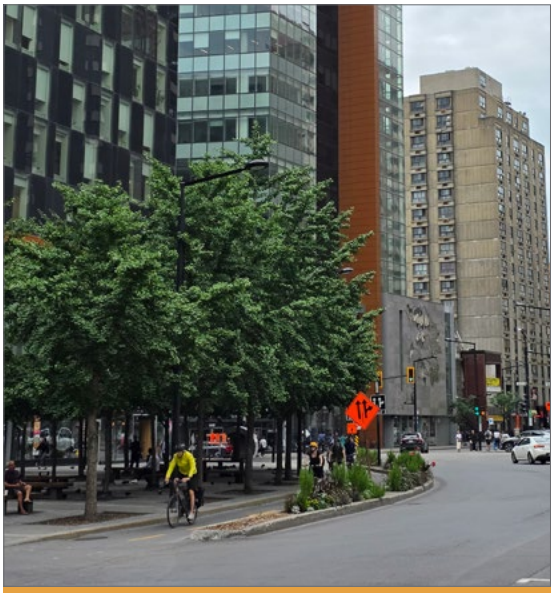


Photo: Dr. Anabela Bonada, Intact Centre on Climate Adaptation

Including urban design as an assessment category recognizes that heat resilience cannot be achieved solely at the building or household level. Even well-designed buildings are affected by the surrounding urban context. Assessing urban design helps municipalities evaluate whether public spaces, transportation routes, neighbourhood layouts, and long-term planning frameworks support safer outdoor conditions during extreme heat, particularly for people who rely on walking, transit, or public space.

2.4 Tool Development

The categories included in this extreme heat preparedness scoring tool were selected based on a structured review of municipal climate change and heat adaptation strategies and plans from Canadian and international jurisdictions with comparable climatic, governance, and socio-economic contexts. The jurisdictions included: Vancouver; Calgary; Edmonton; Winnipeg; Toronto; Waterloo; Ottawa; Montreal; New York, NY; Chicago, IL; Phoenix, AZ; Miami, FL; Los Angeles, CA; Sydney, Australia; Melbourne, Australia; Paris, France; and Athens, Greece, among many others.

The review included climate adaptation and heat action plans, urban forest and green infrastructure strategies, community outreach and public health plans, resilient building and land-use plans, official community plans, transportation adaptation plans, and emergency management plans. Best-practice guidance on individual heat adaptation measures was also reviewed, including heat vulnerability and adaptation assessments, heat alert and response systems, urban greening, cool roofs, heat check-ins, and backup power.

Across the literature, extreme heat is consistently framed as a multidimensional risk requiring coordinated action across governance levels, public health, community engagement, emergency response, and the built and natural environments (UNDRR, 2025b). The selected categories represent recurring and well-established domains of shared responsibility, where evidence indicates that targeted interventions can **meaningfully and practically reduce heat exposure, vulnerability, and health impacts for residents.** They capture both enabling conditions for action, such as governance structures and heat-health risk assessment, and tangible interventions, such as community response, green infrastructure, building retrofits, and heat-resilient urban design.

The categories were reviewed and vetted by subject-matter experts participating in the study (see Section 2.5). The categories were not selected to represent an exhaustive inventory of all possible heat-related actions, but to focus on areas where municipalities and their partners can have meaningful influence and where improvements are observable, measurable, and linked to better outcomes for residents.

The assessment questions within each category were developed from the literature review and validated with subject-matter experts. Some categories include multiple assessment questions, reflecting the breadth and diversity of meaningful actions within those domains.

!

2 to 3 times

more days above 30°C projected for many Canadian cities by 2080.

2.5 Selection of Subject Matter Experts

Subject-matter experts were engaged to review the scoring tool and provide feedback to strengthen its rigour, clarity, and usability. Key domains of heat-related knowledge and practice were identified to reflect the multidimensional nature of extreme heat risk and response, including public health, heat physiology, health care, housing and indoor temperature standards and guidelines, municipal operations, infrastructure, emergency management, urban planning and design, engineering, building codes and standards, energy resilience, nature-based solutions, environmental law, insurance, risk assessment, regional climatology, and climate change adaptation.

Experts were selected primarily from Canada, with additional international experts included to provide complementary perspectives from other jurisdictions. Their input helped ensure that the scoring tool reflects current best practice, captures the breadth of meaningful municipal action on extreme heat, and is grounded in interdisciplinary expertise.

In total, **more than 80 reviewers representing over 45 organizations provided structured feedback on the first iteration of the scoring tool** (see Acknowledgements). Following this review, a subset of experts from key practice domains, including public health, municipal operations, housing, energy resilience, and urban planning, participated in a beta-testing phase. Beta testing involved working through the tool in a test-case format to evaluate its content, logic, flow, and clarity from a user perspective. Feedback informed targeted refinements to question wording, scoring structure, and guidance, helping ensure that the tool is both technically sound and practical for use by municipalities and their partners.

2.6 Scoring Calculation

Each assessment question includes **pre-defined answer** choices aligned with performance levels ranging from A, high performance, to E, low performance. Municipalities, working with public health, community organizations, and other external partners, select the performance level that best reflects current practice for each question. Letter grades are then converted to numerical scores from 1 to 5: A = 5, B = 4, C = 3, D = 2, and E = 1.

To calculate a category-level score, the numerical scores for all questions within that category are summed and averaged. All questions within a category are weighted equally.

To calculate an overall municipal preparedness score, the scores for all eight categories are averaged. Each category is weighted equally.

Extreme Heat Preparedness Scoring Tool

3

The following tables, organized by category, comprise the extreme heat preparedness scoring tool. In areas exposed to wildfire risk, vegetation, landscaping, and shade structures should be designed, located, constructed, and maintained in accordance with FireSmart™ guidance and local wildfire risk assessments.

1. Governance

1.1 How is extreme heat recognized within municipal policy, planning, and action?

SCORE	DESCRIPTION
A	Understood as part of broader **systemic challenges** - such as urbanization, housing affordability, inequality, and climate change.
B	**Integrated into broader** disaster risk reduction and climate adaptation strategies.
C	**Recognized** as a growing public health and resilience issue.
D	Recognized **only** during extreme heat events.
E	**Not** recognized.

1.2 To what extent is leadership for extreme heat defined and sustained?

SCORE	DESCRIPTION
A	In addition to levels D, C and B, governance is maintained following leadership changes, since **resilience is embedded in official plans and formal policies, protocols, and procedures**.
B	**Formal leadership structure is established** (e.g., a heat officer, heat office, interdepartmental heat committee, multi-stakeholder heat working group) with clearly defined responsibilities and decision-making authority.
C	The city is planning to establish a **formal leadership structure** and is presently working on clarifying the associated responsibilities.
D	Informal or emerging leadership **is defined and assumes responsibility** during extreme heat events.
E	**No** designated leadership or clear accountability exists.

1.3 What is the approach to managing extreme heat - from reactive to proactive response?

SCORE	DESCRIPTION
A	The approach is **proactive, enabling long-term risk reduction**. Comprehensive anticipatory strategies (e.g., climate-resilient urban design/planning, nature-based solutions, heat-resilient housing and infrastructure) are in place and integrated across sectors and governance levels.
B	**Heat Action Plans** are developed and implemented, and the heat alerting system is strengthened to better reach vulnerable groups through multimodal messaging.
C	Initial components of a **Heat Alert and Response System** are developed, along with seasonal public engagement and small pilot outreach projects.
D	Responses are mainly **reactive and crisis-driven**, with limited public engagement or communication on heat risks.
E	There is **no response** to heat risk.

1.4 What is the degree of collaboration to address extreme heat across internal departments and with external partners?

SCORE	DESCRIPTION
A	Formal, structured partnerships across departments and with external organizations, relevant sectors, civil society and levels of government. **Collaboration is structured, strategic, and leads to joint programs and policy innovation**.
B	Routine, inter-departmental coordination and structured partnerships with external organizations are in place. **Joint initiatives are underway**, and collaboration is becoming routine.
C	Informal partnerships, pilot-level or project-specific collaborations **across some** departments and with external organizations.
D	Efforts occur in department silos, with **inconsistent or little** coordination and information sharing.
E	**No collaboration of any kind**. Heat-related activities occur in isolation.

1.5 How is relevant extreme heat data shared to support decision making?

SCORE	DESCRIPTION
A	Data is shared through **centralized systems that support real-time decision making**.
B	**Data is shared** routinely across departments and with external partner organizations to support planning, decision making, and evaluation.
C	Data is shared in **limited** or project-specific contexts. Sharing is situational rather than routine.
D	Data is **not shared** across departments or with external partners; it remains siloed.
E	Data is **not collected**, maintained, or accessible in a usable form. There is no basis for sharing or analysis.

1.6 What level of funding and resourcing is in place to support extreme heat governance?

SCORE	DESCRIPTION
A	**Permanent funding and dedicated staffing** support systemic heat risk management.
B	**Multi-year funding** and dedicated staffing provide stability for heat programs and initiatives.
C	Project-based or **short-term funding** and staff capacity support early initiatives.
D	There is **limited funding**, staff capacity, and infrastructure to address heat impacts.
E	There is **no funding**, no staff capacity, and no infrastructure.

1.7 How are monitoring, evaluation and learning carried out for heat programs and initiatives?

SCORE	DESCRIPTION
A	Monitoring and evaluation are ongoing and routine. **Learning is adaptive and iterative, with lessons regularly shared across departments, partners, and stakeholders**. Governance structures and practices evolve continuously based on new insights, evidence, and emerging challenges.
B	Monitoring and evaluation are ongoing and routine. Lessons learned **are consistently integrated** into planning, decision-making, and program adjustments, reinforcing continuous improvement.
C	Programs have clear goals and indicators, but monitoring, evaluation, and learning occur **inconsistently**.
D	Evaluation occurs **sporadically** or mainly after crises or major events. Success metrics are unclear and learning is limited, with few changes to ongoing practices.
E	**No** monitoring or evaluation takes place.

Health Canada Resources for Heat-Health Vulnerability Assessments:

- Adapting to Extreme Heat Events: Guidelines for Assessing Health Vulnerability
- Climate change and health vulnerability and adaptation assessments: A knowledge to action resource guide
- Climate change and health vulnerability and adaptation assessments: Workbook for the Canadian health sector

2. Assessing Extreme Heat Health Risk

2.1 How has the municipality assessed the heat-health vulnerability of the community?

SCORE	DESCRIPTION
A	Using the results of the Assessment developed in level B, the municipality creates and/or revises policies and plans related to municipal response and community heat resilience. **The Assessment is reviewed and updated regularly**, such as every five years or when major new risks, data, or events emerge, to reflect evolving heat risks, shifts in population vulnerability, changes in community infrastructure, new health evidence, and ongoing policy, planning, and funding needs.
B	Building on the research, mapping, and activities described in levels D and C, the municipality has worked with the local public health agency and community partners to complete one of the following: ▪ a Climate Change and Health Vulnerability and Adaptation Assessment; or ▪ an **Extreme Heat and Health Vulnerability Assessment**. The assessment identifies: ▪ how extreme heat is experienced locally, including current and projected heat exposure. ▪ populations, neighbourhoods, and settings at greatest risk of heat-related harm. ▪ local actions needed to reduce exposure, strengthen preparedness, and protect people most at risk during extreme heat events.
C	The municipality has worked with the local public health agency to **assess and map heat exposure and population vulnerability**. Using tools such as the HealthPlan.City, Climate Insight, in-house geospatial tools, socio-demographic data, and health data, the municipality has identified: ▪ areas/locations of high heat exposure; ▪ neighbourhoods where high heat exposure overlaps with high concentrations of one or more susceptible populations; and ▪ community amenities such as community centres, libraries, pools, splash pads and parks, that could be used by residents for respite from extreme heat.
D	The municipality has **conducted basic research** to identify: ▪ outdoor temperatures experienced in the past and expected in the future; ▪ individuals and populations that are generally most sensitive or susceptible to harm from extreme heat; and ▪ actions that can be taken at a local level to protect residents and visitors from extreme heat.
E	The municipality **has not assessed** the vulnerability of the community to the health risks of extreme heat.

3. Heat Alerts, Communication, and Municipal Employee Protocols

Additional Considerations

Provincial/territorial occupational health and safety requirements can strengthen protection for workers across the community, including municipal, private sector, contract, and migrant workers. Municipalities may wish to document whether provinicial or territorial legislation, regulations, standards, or guidelines require employers to assess heat exposure, train workers, develop heat stress prevention plans, implement heat-protective protocols, and update requirements to reflect changing climate conditions.

3.1 To what extent has the municipality established and implemented extreme heat protocols and training to educate and protect municipal employees?

SCORE	DESCRIPTION
A	In addition to levels D, C and B, the municipality, in consultation with employees and/or their representatives, conducts a **post-season review** of the classification of workers by potential exposure, protocols and training, and makes recommendations for the next season.
B	The municipality has **implemented extreme heat protocols** for municipal employees in applicable tasks, situations, and positions. Protocols include flexible schedules, more frequent breaks, access to drinking water, cooling stations, cooling equipment, and clear procedures for responding when an employee shows signs of heat stress.
C	The municipality **has trained municipal employees** on health risks, signs and symptoms of heat stress, applicable extreme heat protocols, response actions, susceptible populations, and protective actions for themselves, colleagues, families, and members of the public.
D	The municipality, in consultation with municipal employees and/or their representatives, has **assessed and identified** protocols needed to keep employees safe during extreme heat. These may include: ▪ flexible schedules, more frequent breaks, access to drinking water and cooling stations, and ice vests; ▪ tasks, situations and/or positions that are subject to various extreme heat protocols; ▪ how protocols are to be enforced; and ▪ actions to be taken if an employee is experiencing symptoms of heat stress.
E	The municipality **has not developed** protocols or training to protect municipal employees from extreme heat.

3.2 How does the municipality communicate heat warnings, heat-health risks, and protective actions to staff, community partners, and residents in an accessible and effective manner?

SCORE	DESCRIPTION
A	In addition to the actions described in levels D, C, and B, the municipality convenes **post-season meetings** with public health, community partners, and community organizations to review how the education and communications plan was implemented during the heat season and how it can be **improved for future heat seasons**. Findings are documented and used to update the plan.
B	In addition to levels D and C, the plan's educational materials and media messages have been developed to **effectively influence the behaviour of susceptible populations** in the community. The educational materials and messages: ▪ are clearly and concisely communicated in appropriate formats (e.g., fridge magnets, posters, flyers etc.); ▪ reflect the lived experience and needs of the susceptible populations, ▪ have been translated into languages used by susceptible populations and provided in accessible formats; ▪ are delivered by people who are trusted by the various susceptible populations.
C	The municipality has worked with public health, community partners, and community organizations that serve or represent susceptible populations to develop and implement an Education and Communications Plan for extreme heat. This plan **includes educational materials and media messages** that explain: ▪ health risks associated with extreme heat; ▪ individuals and populations most susceptible to harm; and ▪ actions people can take to protect themselves, their families, and their neighbour from extreme heat.
D	The municipality has **established a process** for receiving Heat Warnings from Environment and Climate Change Canada (ECCC) or another reputable organization, **and disseminating those messages** to municipal staff, community partners such as schools, childcare facilities, long-term care facilities and hospitals, and the community at large.
E	The municipality **does not have a process** for receiving Heat Warnings or communicating heat-health messages to staff, community partners, or residents.

4. Community Mobilization and Response

4.1 How does the municipality mobilize community partners and deliver supports to protect susceptible populations during extreme heat events?

SCORE	DESCRIPTION
A	In addition to the actions described in levels D, C, and B, the municipality convenes **post-season meetings** with community partners. The purpose is to review implementation of the Community Response Plan during the heat season and identify improvements for future heat seasons. **Findings are reported to Council annually**.
B	In addition to levels C and D, during extreme heat, the municipality and its partners **provide susceptible populations with**: ▪ free transit passes; ▪ pop-up cooling hubs with shade, ice and drinking water in under-serviced neighbourhoods with susceptible populations or unhoused populations; and ▪ an air conditioning program with annual funding that provides air conditioners and/or heat pumps to low-income residents.
C	The municipality **has developed a Community Response Plan** and convenes pre-season meetings with public health, community partners, and community organizations to organize, coordinate, and prepare for the heat season. During extreme heat events, the municipality, community partners and community organizations provide susceptible populations with information about, and free access to: ▪ public swimming pools, splash pads, parks; ▪ community centres, cooling centres, and cooling rooms in apartment buildings that provide cool air, water, comfortable seating, and bathrooms; and ▪ drinking water.
D	The municipality is working with public health, community partners such as schools, childcare facilities, long-term care facilities, and hospitals, and community organizations that serve or represent susceptible populations, **to develop a Community Response Plan** (or 'Heat Response Plan', 'Heat Relief Strategy' or similarly named plan) to protect the lives of susceptible populations.
E	The municipality **does not** have a coordinated community response plan or process to protect susceptible populations during extreme heat events.

Check-In Programs offered in some cities:

- Vancouver's Resilient Neighbourhood Program
- New York's Be a Buddy Program
- Paramedics in the Mobile Integrated Health Program, run by Hamilton, check in on registered clients during extreme heat.

4.2 To what extent are heat check-ins provided for people in the community who are at high risk of harm from extreme heat?

SCORE	DESCRIPTION
A	In addition to levels D, C, and B, the municipality convenes a **post-season meeting** with its partners to review implementation of the heat check-in program, identify improvements for future heat seasons, and update the program based on lessons learned.
B	Provincial/territorial partners and/or the municipality **provide grants and support** to community groups to educate and coordinate volunteers who check in on individuals at high risk of harm during extreme heat events. The provincial/territorial partner, municipality, and/or community partners also provide **targeted check-ins** through mobile outreach services, phone calls, or other direct contact with people at high risk of harm.
C	The municipality and/or its partners **have developed, and are implementing, an extreme heat check-in program** that mobilizes community groups and volunteers to check in on individuals at high risk of harm during extreme heat events.
D	The municipality has **convened meetings** with public health, its provincial/territorial partner, community partners such as hospitals and paramedics, and community organizations that serve or represent susceptible populations, to discuss how to coordinate and support extreme heat check-ins for individuals at high risk of harm during extreme heat events.
E	The municipality **has not taken steps** to support or encourage extreme heat check-ins.

5. Green Infrastructure

5.1 How does the municipality use urban forestry to reduce heat risk?

SCORE	DESCRIPTION
A	In addition to the actions described in levels D, C, and B, the municipality has a **comprehensive, strategic Urban Forest Program** with continuous improvement. The program includes: ▪ fully mainstreamed urban forestry that is strategic (with equity-focussed planting), data-driven and designed to reduce heat risk; ▪ integration into climate plans, resilience strategies, and land-use planning • e.g., Official Community Plan or equivalent plan is supported with High Performance Development Standards or Green Building Standards that require the protection of trees or the planting of new trees when new properties are developed ▪ regular monitoring/assessments of tree canopy; ▪ annual reporting on progress (against targets), provided to council; and ▪ long-term funding mechanisms in place.
B	**A Formalized Urban Forest Program** exists, with: ▪ interdepartmental coordination (e.g., planning + public works + parks) ▪ regular operations include planting, maintenance, monitoring, and protecting trees when development occurs ▪ prioritizes neighbourhoods with high air temperatures and a high concentration of sensitive or susceptible populations; ▪ dedicated staff and budgets ▪ external funders engaged; and ▪ routine partnerships with community groups, utilities, NGOs, or researchers. On private property: ▪ planting of trees is promoted; ▪ bylaws prohibit cutting of trees without approval/permit; and ▪ free shade trees are given to the public for planting.
C	An **Urban Forest Program** is being developed in consultation with public health, community partners, community organizations that serve or represent susceptible populations, and other relevant partners. The strategy or plan: ▪ recognizes the benefits of urban greening, including reducing urban heat; ▪ measures tree canopy through mapping or an inventory of existing canopy; ▪ sets targets for increasing tree canopy; ▪ identifies priority neighbourhoods for planting, based on heat exposure and population vulnerability; ▪ establishes a workplan with milestone dates; and ▪ identifies annual funding needs. The municipality also provides education to private property owners on the benefits of greening properties, including health benefits, energy savings, and heat reduction.
D	**Some** tree planting, planning, protection, or maintenance occurs, but activities are informal, ad hoc, project-based, or limited to specific departments, such as parks, roads, or public works. Early efforts may include small pilots, such as neighbourhood tree planting, school partnerships, or collaborations with community groups.
E	**No** Urban Forest Program or coordinated tree-related activities exist.

5.2 How does the municipality use green infrastructure (natural systems like plants, soils and porous materials) along street rights-of-way and public lands, for stormwater management and cooling co-benefits?

SCORE	DESCRIPTION
A	In addition to the actions described in levels D, C, and B, the municipality has a **comprehensive, strategic green infrastructure program** that is regularly monitored, evaluated, and improved. Progress is reported to Council annually, and long-term funding mechanisms are in place to support implementation, maintenance, and expansion.
B	The **Green Infrastructure Stormwater Management Plan** is being implemented. Implementation prioritizes neighbourhoods with high flood risk, high heat exposure, and high concentrations of populations at risk of harm from extreme heat. **Incentives** (e.g., tax relief, grants, rebates, etc.) are offered for retrofits for green infrastructure for stormwater management on private property.
C	Building on policy direction in the Official Community Plan and relevant master plans, the municipality **has developed a Green Infrastructure Stormwater Management Plan** in consultation with public health, community partners, community organizations that serve or represent susceptible populations, residents, and other parties. It includes: ▪ design standards and guidelines ▪ prioritization of neighborhoods with high flood risk and a high concentration of susceptible populations ▪ defined responsibilities and coordination across departments and with partner organizations; and ▪ coordination with other departments and municipal programs (land use planning, climate adaptation, stormwater management, etc.). The municipality has **provided education to the private sector and residents** on the value green infrastructure for stormwater management and cooling.
D	The municipality is **exploring opportunities** for green infrastructure for stormwater management and cooling co-benefits. This may include: ▪ staff discussions; ▪ consultations with community partners and residents; ▪ initial research or scoping; ▪ early pilots that may include: • small-scale green infrastructure projects – for example, rain gardens that include a mix of trees, flowers, shrubs and grasses; bioswales; and tree trenches in the public right-of-way (ROW) • larger green infrastructure practices, such as constructed wetlands, permeable pavements, holding ponds, and subsurface storage for stormwater, on public properties ▪ partnerships with public health, community agencies, non-profit organizations, researchers, and/or private sector organizations; and ▪ recognition of co-benefits (water management and cooling)
E	Municipality **does not use** green infrastructure for stormwater management and cooling co-benefits, on street rights-of-way and public lands.

6. Existing Buildings

6.1 How does the municipality implement and support cool roofs on existing municipal-owned buildings?

SCORE	DESCRIPTION
A	A comprehensive, integrated, and **equity-focused Cool Roof Program** is in place for municipally owned buildings. The program includes: ▪ a long-term implementation plan with timelines and budgets; ▪ prioritizes buildings with high heat exposure and vulnerable occupants; ▪ monitors performance such as indoor temperature and energy savings; and ▪ uses results to support continuous improvement. The municipality has also adopted a bylaw requiring owners of other public and privately owned buildings with low-slope or no-slope roofs to install a cool roof when replacing an existing roof.
B	A **formal cool roof policy and design guidelines and standards** have been developed to guide retrofits for existing municipally owned buildings. The policy includes: ▪ all eligible municipal buildings have been assessed for cool roof retrofits, implementation is underway across municipal buildings, and staff have guidance, training, and procurement pathways to support implementation; ▪ cool roofs are integrated into broader climate adaptation, energy management, and/or heat-risk reduction strategies; and ▪ a formal incentive program, such as tax relief, grants, or rebates, is operational to support cool roof implementation on other public and privately owned existing buildings.
C	The municipality has **developed** an approach for cool roofs, for municipally owned buildings, which includes: ▪ one or more **pilot cool roof retrofits** may be underway or completed on selected **municipal buildings**; ▪ draft guidelines or standards have been prepared, in consultation with community partners and stakeholders. In addition, the municipality **is developing a financial incentive program** to encourage implementation of cool roofs as a replacement for dark roofs, for other public and privately owned buildings. Incentives may include tax relief, grants, and/or rebates.
D	The municipality is **beginning to explore** the use of cool roofs. Preliminary research on materials, costs, and benefits is underway. Education on the benefits of cool roofs is provided to other building owners (public and private).
E	The municipality does **not** implement or support cool roofs as a heat reduction approach for its own existing buildings.

6.2 How does the municipality support upgrades to existing buildings that improve heat resilience through passive cooling measures and energy-efficient mechanical cooling, beyond cool roofs?

SCORE	DESCRIPTION
A	In addition to the actions described in levels D, C, and B, **a comprehensive, strategic program with continuous improvement** exists to upgrade residences and buildings, for passive cooling techniques and mechanical cooling with: ▪ joint municipal, and/or provincial/territorial and federal oversight; ▪ regular monitoring and assessment of the program; ▪ annual reporting on progress; ▪ dedicated multi-year funding; ▪ an equity-focused approach with high coverage for low-income households and buildings; ▪ annual release of funds and rapid approvals; and ▪ clear and simple eligibility, with automatic enrolment for households already in income-qualified programs (e.g., provincial programs such as the Ontario Drug Benefit or Ontario Works, or the CleanBC Income Qualified Program in British Columbia). **Examples** of upgrades provided in level D.
B	The municipality, in collaboration with provincial/territorial and federal governments, **provides rebates, grants, or other financial incentives** to: ▪ low-income households and/or privately owned, low-income multi-unit residential buildings; ▪ incentives support building upgrades that improve heat resilience, including passive cooling measures and mechanical cooling, such as high-efficiency heat pumps; ▪ general energy-efficiency, low-carbon, and/or renewable energy upgrades may also be supported; ▪ the level of coverage, access, scale, and eligible upgrades are determined by the participating levels of government; and ▪ the program includes a reasonably simple application process, multilingual materials, and clear prioritization for low-income households and buildings. Examples of eligible upgrades are provided in level D.
C	The municipality **is working with** other jurisdictions, such as the province/territory and federal government, and consulting with public health, community partners, and community organizations that serve or represent susceptible populations, to provide rebates, grants, or other financial incentives to organizations including: ▪ affordable, supportive, and/or cooperatively owned housing, including Multi-Unit Residential Buildings (MURBs); and ▪ publicly owned and/or non-profit organizations providing public, cultural, or community services (e.g., long-term care, health care facilities, schools). These incentives support building upgrades for heat resilience, including passive cooling measures and mechanical cooling, such as high-efficiency heat pumps. Other general energy-efficiency, low-carbon, and/or renewable energy upgrades may also be supported. The level of coverage, access, scale, and eligible upgrades are determined by the municipality and collaborating jurisdiction(s). Examples of upgrades provided in level D.

SCORE	DESCRIPTION
D	The municipality **has begun upgrading existing, municipally owned buildings** (including LTC facilities) for heat resilience, with **passive cooling** techniques and **mechanical cooling** (high-efficiency heat pumps). Other general energy-efficiency, low-carbon, and/or renewable energy upgrades may also be supported. Examples of upgrades include: ▪ heat pumps for space conditioning (heating and cooling); ▪ other HVAC system upgrades, such as advanced ventilation, smart controls, variable-speed components, and zoning systems; ▪ building envelope upgrades, such as weather stripping and air sealing; ▪ window and door upgrades that minimize solar heat gain (low solar heat gain coefficient); ▪ external solar shading; ▪ lighting upgrades, such as energy-efficient LED lighting; ▪ renewable energy installations, such as solar PV panels or other renewable energy systems; and ▪ building electrification, such as transitioning from natural gas to electric systems when replacing existing gas-fired equipment.
E	**No effort or support** exists to upgrade existing buildings with passive or mechanical cooling.

6.3 How do the municipality and province/territory protect renters from unsafe indoor temperatures in multi-unit residential buildings?

SCORE	DESCRIPTION
A	The province/territory **has legally declared cooling to be a vital service**, analogous to heat, electricity, or water, enabling stronger action to protect tenants from unsafe indoor temperatures. The municipality meets all criteria for B and, in addition has adopted a maximum indoor temperature bylaw, aligned with health-protective guidance, **including Health Canada's recommended 26°C upper indoor temperature limit** for older adults, that requires landlords to maintain at least one cool room or safe cooling area in each rental unit or living space during extreme heat. **Enforcement is proactive** and includes routine inspections, seasonal compliance checks, priority inspections in vulnerable buildings, and multilingual complaint channels. The municipality tracks compliance and publishes outcomes, which inform program updates.
B	The province/territory has **legally declared cooling to be a vital service**, analogous to heat, electricity, or water, and the municipality has adopted a maximum indoor temperature bylaw for MURBs. The bylaw is aligned with health-protective guidance, including Health Canada's recommended 26°C upper indoor temperature limit for older adults. **Enforcement is primarily complaint-driven**, and inspections may be intermittent or uneven. The provincial/territorial government and/or the municipality has also **established a program to provide air conditioners and/or heat pumps to low-income households**, with priority given to renters and individuals with physical or mental health conditions that place them at particularly high risk of harm from extreme heat.
C	The municipality has **established an education program for landlords and MURB owners** on indoor overheating risks and tenant safety during extreme heat. Building owners are encouraged to implement mechanical cooling, such as heat pumps and/or air conditioning, and passive cooling measures to improve occupant thermal safety. In addition, the municipality **is examining** provincial/territorial authorities, municipal bylaws, standards, or other policy tools that could be used to protect tenants from unsafe indoor temperatures.
D	The municipality **is investigating concerns about high indoor temperatures** in rental units and identifying actions that landlords can take to protect tenants from extreme heat. The municipality **consults** with public health, community partners, community organizations, landlords, and tenants about actions the municipality can take to protect renters from unsafe indoor temperatures.
E	The municipality has **not** taken steps to protect tenants from extreme heat inside rental units.

6.4 To what extent are mechanical cooling requirements implemented in all long-term care homes and resident rooms within the city, and what role does the municipality play in supporting, implementing, monitoring, or advocating for these requirements?

SCORE	DESCRIPTION
A	The province/territory has established a **legally binding requirement** that every LTC home (cool space and all resident rooms) must have fully functioning mechanical cooling. The initiative is fully operationalized and includes: ▪ application to all long-term care homes, including public, non-profit, private, and mixed-management homes; ▪ clear performance standards, including the ability to maintain indoor temperatures at or below 26°C, consistent with Health Canada's upper indoor temperature guidance for older adults; ▪ annual verification of full compliance through inspections, audits, and transparent public reporting; ▪ rapid enforcement mechanisms, such as orders or fines, for non-compliant homes; and ▪ integration into heat-health action plans, licensing requirements, and emergency preparedness standards or guidelines.
B	The province/territory has set a **legal mandate** for mechanical cooling for LTC homes – both for designated cools spaces and **resident rooms**. Implementation is underway: ▪ many long-term care homes have implemented the mandated cooling; ▪ some homes are in transition or awaiting upgrades; ▪ some homes face technical or capacity barriers, such as outdated electrical infrastructure; and ▪ funding may be provided.
C	The province/territory **issues a legal mandate for mechanical cooling for a cool space or common areas only**. No requirement that all residents room have cooling.
D	The province/territory **may issue guidance or recommendations** for mechanical cooling in all LTC resident rooms and designated cool spaces in LTC facilities, but there are no legally binding standards. Some LTC homes independently install mechanical cooling; others lack cooling entirely.
E	Mechanical cooling is **not** mandated for LTC homes in the province/territory.

6.5 To what extent do the municipality and the province support or mandate backup power for new and existing Multi-Unit Residential Buildings (MURBs) to protect residents during sustained, area-wide power outages (not tied to an immediate building emergency like fire)?

SCORE	DESCRIPTION
A	The municipality has **established a municipal bylaw for extended-outage backup power for MURBs for basic residential services**, aligning with the provincial legislation. Enforcement is proactive, with priority inspections in vulnerable buildings. Municipality tracks compliance and publishes outcomes, which inform program updates. The province/territory **mandates extended-outage backup power for MURBs**, through legislation. It may provide capital funding, enforcement, and transparent compliance reporting. Requirements apply to new and existing buildings.
B	The municipality **issues guidelines or standards** that encourage MURB owners and landlords to implement extended-outage backup power. Financial incentives (grants, tax relief, financing) are provided that prioritize high-risk/low-income buildings. Province/territory **introduces legislation** to support extended-outage backup power for MURBs. In collaboration with the municipality, it may provide targeted funding for retrofits (electrical capacity upgrades, generators, batteries, etc.) with priority given to high-risk/low-income buildings.
C	The municipality **issues guidelines** that require backup power in MURBs, during prolonged, area-wide outages. The province/territory **acknowledges the need** for extended-outage backup power, and/or publishes voluntary guidelines or best practices, or proposes legislation (e.g. proposed amendments to the provincial Building Code, Residential Tenancies Act and/or Condominium Act, or similar legislation).
D	The municipality **acknowledges that the lack of backup power for MURBs** presents a challenge for residents and it is exploring options for developing guidelines and educational materials for MURB owners. At the provincial/territorial level, **there are still no standards or guidelines** for backup power beyond the basic two-hour emergency requirements.
E	There are **no** policies, standards or guidelines at the municipal or provincial/territorial levels for back-up power for MURBs during sustained, area-wide power outages.

7. New Buildings and Properties

7.1 To what extent does the municipality require and support heat-resilient design and construction in new buildings, to ensure safe indoor temperatures for occupants (and to reduce energy use and emissions)?

SCORE	DESCRIPTION
A	The municipality **monitors and reports** on the implementation and effectiveness of mandatory standards, and updates them based on new data, technology, and heat-risk projections — leading to continuous improvement.
B	**Mandatory standards** introduced at level C, are **actively enforced** through development approvals, permit reviews, and inspections.
C	The municipality **has adopted standards or guidelines** that go beyond building code to raise the performance of new building projects — improving thermal safety, heat resilience, energy-efficiency, and/or emissions reduction in new construction. These standards may be termed "High Performance Development Standards," "Green Building Standards," or another similar term. Examples include: ▪ indoor overheating limits or thermal safety requirements, such as maintaining at least one safe, cool room or living space at or below a health-protective indoor temperature threshold; ▪ cool roofs, green roofs, and solar power generation; ▪ operable exterior solar shading; ▪ operable windows and natural ventilation; ▪ building energy performance measures, including energy-efficiency, reduced carbon emissions, and renewable energy installation; ▪ high-efficiency HVAC systems, such as heat pumps; ▪ tree planting or shade-oriented site planting; and ▪ cool or reflective paving or landscaping.
D	Extreme heat is **explicitly recognized as a climate hazard and priority** issue in the municipality's **Official Community Plan** (OCP) **or equivalent plan**. The plan calls for improving heat resilience in the built environment, but no standards or municipal requirements have been formally developed.
E	Municipalities **meet provincial/territorial building code requirements** for the construction of new buildings.

8. Urban Design

8.1 Does the city create shaded transportation routes to protect pedestrians, cyclists, and transit users from extreme heat?

SCORE	DESCRIPTION
A	The municipality **enforces the heat-related goals** in its high-level and implementation policies and plans when reviewing road construction or reconstruction plans, subdivision plans and site plans. It tracks the results and reports on them to Council on a regular basis.
B	In addition to the actions described in levels D and C, the municipality **has adopted and is implementing policies, plans, or design standards**, such as Transportation Master Plans, Secondary Plans, and right-of-way standards, that require new and reconstructed streets and public spaces to: ▪ provide shade-producing, pollution-tolerant trees along sidewalks, streets, cycling routes, and pathways, and at transit stops; ▪ provide shade structures where tree planting is not feasible or will not provide sufficient shade; ▪ prioritize shade improvements in under-served neighbourhoods with high concentrations of susceptible populations; ▪ reduce the amount of paved or other impervious surface in parking lots; and ▪ incorporate landscaped islands that can support mature shade trees, shade structures, and/or solar panels in surface parking lots.
C	Building on level D, and **in consultation with** public health, community partners, and community organizations that represent or serve susceptible populations, and other stakeholders, the municipality **is developing or updating implementation policies and plans**, such as a Transportation Master Plan, Secondary Plans, and Right-of-Way Standards, to provide cool transportation routes for pedestrians, cyclists, transit users, and other users of active modes of transportation.
D	The municipality **has made a commitment to increasing the community's heat resilience** and/or increasing the overall ratio of greenspace to grey space over time, in its high-level policy documents such as a Community Plan or Official Plan.
E	The municipality **has not addressed** extreme heat or heat resilience in its high-level policy documents such as an Official or Community Plans.

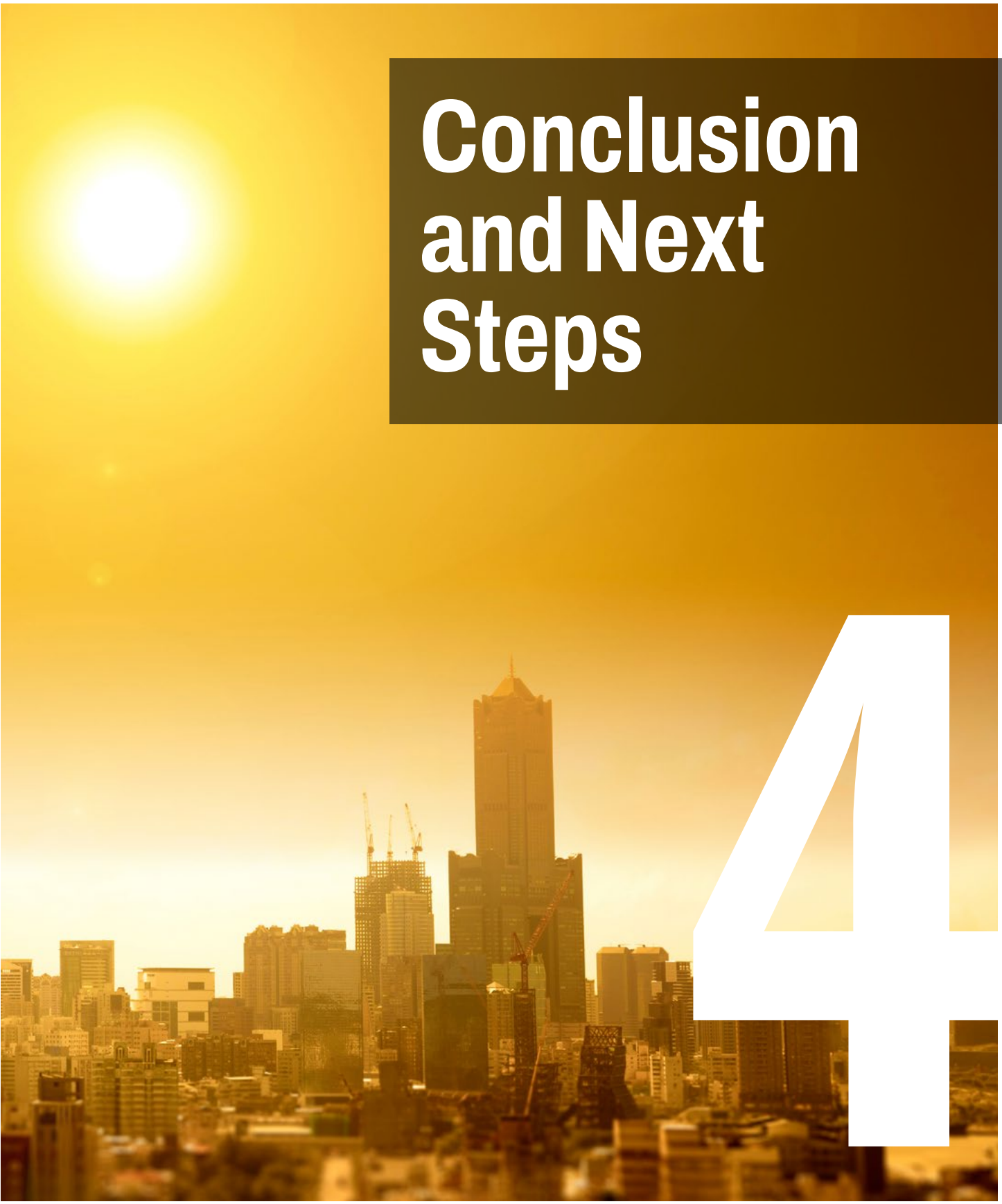
8.2 Does the city work to equitably provide parks, greenspace, and cooling amenities in neighborhoods?

SCORE	DESCRIPTION
A	The municipality **has established a program with stable funding** to invest in parks, recreational facilities, and/or cooling amenities with priority given to under-serviced neighbourhoods that are home to a large concentration of one or more susceptible populations. This program has **targets and timelines and reports regularly to Council**.
B	Building on levels D and C, the municipality **has developed, and is implementing, policies and plans**, such as a Parks and Recreation Master Plan, that commit the municipality to providing all urban residents with easy access to: ▪ high quality greenspace for passive or active recreation; ▪ publicly owned natural areas; and ▪ publicly owned cooling amenities such as pools, splash pads, and drinking water fountains. These policies and plans **prioritize investments in under-serviced** **neighbourhoods** that are home to a large concentration of one or more susceptible populations.
C	Building on level D, the municipality **is developing implementation policies and plans**, such as a Parks and Recreation Master Plan, in consultation with public health, community partners, such as the local public health agency and community organizations that represent or serve susceptible populations, and other stakeholders.
D	The municipality **has made a commitment to increasing the community's heat resilience** and/or increasing the overall ratio of greenspace to grey space in the municipality over time in its high-level policy documents such as a Community Plan or Official Plan.
E	The municipality **has not addressed** extreme heat or heat resilience in its high-level policies such as Community Plans or Official Plans.

8.3 How does the city work to cool the privately owned spaces that are accessible to the public such as plazas, walkways, and parking lots?

SCORE	DESCRIPTION
A	The municipality **enforces the heat-related goals** in these policy and plans when reviewing development applications such as Subdivision Plans and Site Plans. It tracks results and reports them to Council on a regular basis.
B	Building on levels D and C, the municipality **has developed implementation policies**, such as Zoning By-laws and Secondary Plans, that require: ▪ low-rise, mid-rise and high-rise buildings to provide sufficient setbacks and/or step backs to provide adequate space for landscaping and tree planting; ▪ commercial, industrial and institutional buildings to provide adequate space for landscaping and tree planting; ▪ a reduction in impervious surface parking; and ▪ surface parking that incorporates tree islands that support mature shade producing trees, shade structures, and/or solar panels.
C	Building on level D, the municipality **is working in consultation** with public health, community partners, community organizations that represent or serve susceptible populations, and other stakeholders, to develop implementation policies or plans, such as Zoning By-laws and Secondary Plans, that include measures in private developments which provide cooling benefits.
D	The municipality **has committed to increasing the heat resiliency** of the municipality and/or increasing the overall ratio of greenspace to grey space in the municipality over time.
E	The municipality **has not addressed** extreme heat or heat resilience in its high-level policies such as Community or Official Plans.

Conclusion and Next Steps



4

Extreme heat is an urgent and growing risk for Canadian municipalities. As temperatures rise and heat events become more frequent, longer, and more intense, municipalities and their partners must move from awareness to coordinated, measurable action.

Many of the actions needed to reduce extreme heat risk are already known (see Figure 5). Communities can assess heat-health vulnerability, strengthen governance, improve heat alerts and communications, mobilize community partners, expand green infrastructure, upgrade existing buildings, require heat-resilient new development, and design cooler public spaces. The challenge is no longer simply identifying what can be done, but understanding what is already in place, where gaps remain, and how to prioritize implementation.

The **Extreme Heat Preparedness Scoring Tool** is designed to support this process. By providing a structured assessment across eight categories of municipal preparedness, the tool helps municipalities and their partners establish a baseline, identify areas of strength and opportunity, support cross-departmental dialogue, and guide investment and policy decisions. Repeated use of the tool can also help track progress over time and strengthen accountability.

To accelerate preparedness for extreme heat, municipalities and their partners can use the tool to:

1. Benchmark current preparedness across governance, risk assessment, communication, response, buildings, green infrastructure, and urban design.
2. Identify priority gaps where additional policy, funding, staff capacity, data, or partnerships are needed.
3. Strengthen collaboration across municipal departments, public health authorities, community organizations, housing providers, utilities, other orders of government, and the private sector.
4. Integrate heat risk reduction into existing plans, policies, capital programs, development standards, emergency management systems, and public health initiatives.
5. Track progress over time by repeating the assessment and using results to guide continuous improvement.

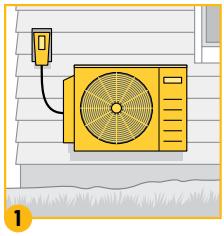
The next stage of this work will apply the scoring tool to **evaluate the extreme heat preparedness of 30 of Canada's largest cities.** This assessment will quantify preparedness against pre-defined criteria, provide comparable results, and identify areas of strength and opportunity for improvement in each city. The findings will provide a practical roadmap to help municipalities, public health authorities, community partners, other orders of government, and the private sector advance actions that reduce heat risk for residents.

Ultimately, reducing extreme heat risk requires heat resilience to become a routine part of municipal decision-making, not an exceptional response during emergencies. The risks are real, but many deaths and illnesses are preventable when communities plan ahead, coordinate effectively, and invest in practical measures that protect people before, during, and after extreme heat events.

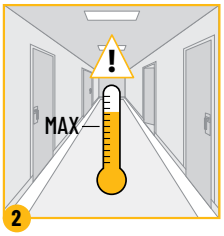
Three Levels of a Heat-Ready Community

Communities can reduce illness, death, and discomfort during extreme heat events by integrating heat-ready features into building design, emergency planning, public spaces, and community programs. Through collaboration with health agencies, community organizations and residents, municipalities can better assess local heat risks, protect vulnerable populations, and create cooler, safer neighbourhoods.

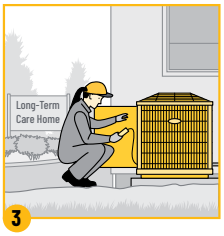
Level 1: Homes and Buildings



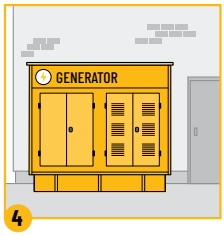
1 Support incentives and upgrades that keep indoor spaces safer during extreme heat, such as heat pumps and shade trees.



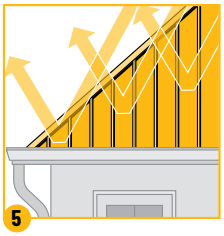
2 Cap maximum indoor temperature to protect residents from unsafe heat.



3 Ensure long-term care homes and community facilities have reliable cooling.

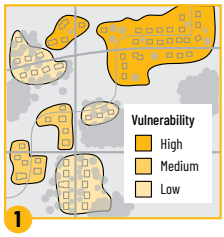


4 Plan for back-up power, with adequate fuel supply, during outages in multi-unit buildings and critical facilities.

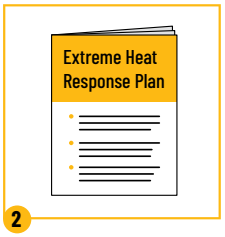


5 Install cool roofs, shading, and efficient cooling systems.

Level 2: Community-Based Heat Risk Management



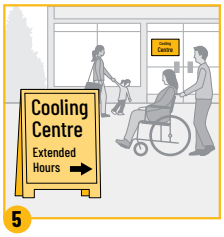
1 Assess and map exposure and vulnerability to extreme heat.



2 Develop, implement, and review an Extreme Heat Response Plan annually.

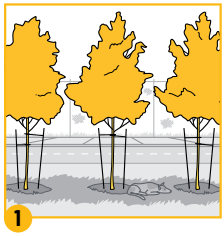
3 Communicate clear heat alerts and practical protective actions to residents, municipal staff, and community partners.

4 Coordinate heat check-ins with public health agencies and community organizations such as Red Cross, Meals on Wheels, Salvation Army.

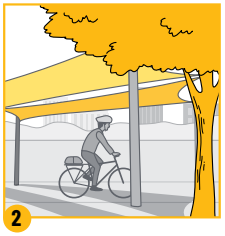


5 Open and promote cooling centres, pools, splash pads, libraries, and other cooling spaces.

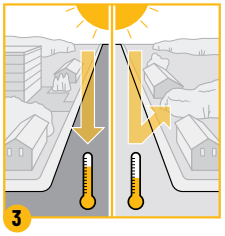
Level 3: Neighbourhood and Urban Cooling



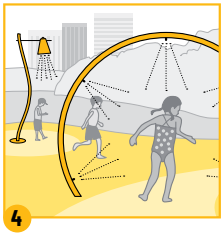
1 Grow and protect urban tree canopy, prioritizing heat-exposed neighbourhoods.



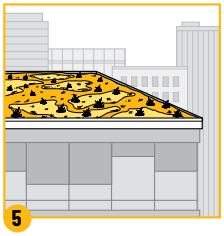
2 Build shaded walking, cycling, and transit routes.



3 Install cool, reflective, or permeable surfaces to reduce heat from asphalt and parking lots.



4 Install water-based cooling features, such as splash pads, misting stations, and drinking fountains.



5 Require heat-resilient urban planning, including green roofs, urban shade, reflective surfaces, and cooler public spaces.

Note: The guidance in this document is voluntary. Completion of actions should not conflict with applicable building codes, public health requirements, or municipal bylaws. Heat-ready communities can reduce but not eliminate risk.

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Scan the code or click the link for additional resources at www.intactcentre.ca

Figure 5: Three Levels of a Heat-Ready Community. (Intact Centre on Climate Adaptation, n.d.)

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Appendix - Definitions

Backup power
Backup power refers to energy services that extend beyond the Building and Fire Codes' emergency life-safety requirements, which typically mandate only two hours of power for essential functions such as emergency lighting, fire safety, one elevator for rescue. In contrast, backup power supports basic services necessary for resident well-being during multi-day power outages and is intended to operate for at least 72 hours. At a minimum, these services should include safe stairwell and elevator access, potable water and pumping, essential power for communication, medical devices, and heating or cooling to maintain safe indoor temperatures (Carou, 2016).

Cool roof
A cool roof is lighter-colored roof that reflects heat. Cool roofs transfer less heat into buildings thereby reducing indoor air temperatures; they also reduce building energy consumption and reduce the generation of waste-heat from air conditioning use (Akbari et al., 2009).

Community response measures
Community response measures are the actions, services, and supports that a municipality and its partners activate to protect people—especially vulnerable populations—during extreme heat events. These measures are a core component of Heat Alert and Response Systems (HARS) as described by Health Canada and other public-health authorities.

External partners
External partners are individual or groups with which the municipality builds or maintains working relationships to assist in the achievement of work objectives. They include agencies and organizations (such as public health, community organizations), sectors (e.g., public, private, nonprofit, and academic), civil society, and levels of government.

Extreme heat
Extreme heat varies based on geographic location and weather conditions such as temperature, humidity, cloud cover, and duration of event. While there is no official, consistent definition of extreme heat, in general it is higher than normal daytime and nighttime temperatures for a given location and time. It may be dangerous and trigger health warnings (Beugin, et al., 2023; Environment and Natural Resources, 2026; Health Canada, 2024).

Extreme heat event
Extreme heat refers to a period of unusually high temperatures relative to local seasonal norms, often lasting several days, and sometimes combined with high humidity and limited overnight cooling, which can pose serious risks to human health (Environment and Natural Resources, 2026). In Canada, extreme heat events (e.g., heat waves) are formally identified when daily maximum temperatures reach or exceed region-specific heat warning thresholds, these conditions persist for two or more consecutive days, and when nighttime temperatures remain elevated, providing little relief from heat stress (ECCC, 2025; Environment and Natural Resources, 2026).

Extreme Heat Community Response Plan
A community response plan supports individuals during extreme heat events by coordinating public health actions that reach and assist those who are most vulnerable (Health Canada, 2012).

Green Building Standards
Green building standards include municipal Green Development Standards (GDS), step codes/tiered codes, performance-based energy/carbon codes, embodied carbon limits, electrification, passive cooling, indoor temperature safety, climate resilience (flood/heat/smoke), water efficiency, and materials/health requirements.

Green infrastructure
Green infrastructure is the natural vegetative systems and green technologies that collectively provide society with a multitude of economic, environmental, health and social benefits. This includes urban forests and woodlots, bioswales, engineered wetlands, stormwater ponds, green roofs and green walls, parks, gardens and grassed areas, natural heritage systems (interconnected meadows, wetlands, waterways and riparian zones), urban agriculture. It also includes soil to sustain green infrastructure and absorb water, as well as technologies like porous pavements, rain barrels and cisterns. (Green Infrastructure Ontario Coalition, 2021)

Grey infrastructure
Grey infrastructure refers to the conventional, engineered systems and structures built primarily from materials such as concrete, steel, asphalt, and glass, designed to manage urban functions and deliver services like transportation, water management, energy, and waste disposal. Grey infrastructure typically includes roads, highways, and bridges; buildings, stormwater pipes, sewers, and drainage channels; water treatment and distribution systems, and power plants and energy transmission infrastructure. While grey infrastructure has been essential for urban development and public health, it can contribute to challenges such as urban heat islands, increased runoff and flooding, environmental degradation, and high maintenance costs if used alone (Hayes et al., 2022; Health Canada, 2020b; INSPQ, 2023).

Heat Alert and Response System
A Heat Alert and Response System (HARS) is a community-based system designed to prepare for and respond to extreme heat events. It typically includes coordinated actions such as identifying heat-health risks, issuing alerts, mobilizing partners, communicating risks to the public, implementing community response and evaluating the effectiveness of these actions. In collaboration with public health agencies, Health Canada developed a HARS that consists of five core components: Community mobilization and engagement, Alert protocol, Community response plan, Communications plan, and Evaluation plan (Health Canada, 2012).

Heat Risk Governance
A coordinated, inclusive, and systems-level approach to managing extreme heat – that brings together actors (e.g. government officials, communities, business owners, workers, investors and funders, civil society, international organizations), institutions, and assets to work together across multiple timescales to guide, coordinate, implement, and oversee the reduction of heat-related risks and related areas of policy, investment and action. (UNDRR, 2025). It prioritizes equity, clearly defined roles, shared responsibility, and sustained coordination—shifting from reactive, short-term responses to proactive, long-term risk reduction and resilience-building (UNDRR, 2025).

Heat season check-in programs
Programs that encourage volunteers to check-in on neighbours, family and friends who are susceptible to harm from extreme heat during extreme heat events. These programs may include check-ins from staff or paramedics hired by community groups, municipalities, or public health agencies.

Heat warnings
Environment and Climate Change Canada (ECCC) issues heat warnings using criteria established in coordination with Health Canada and provincial/territorial health authorities. The exception is Quebec where weather statements are based on the provincial Surveillance and Prevention of the Impacts of Extreme Meteorological Events on Public Health System (SUPREME). The criteria for heat warnings vary by region with 25 different regions recognized across Canada (see Criteria for public weather alerts - Canada.ca). (NCCEH, 2025)

Mechanical cooling

Mechanical cooling refers to the use of powered mechanical systems, most commonly air conditioners and heat pumps, to remove heat from indoor air and maintain comfortable or safe indoor temperatures. Mechanical cooling uses electricity to power compressors, fans, and pumps that transfer heat from inside a building to the outdoors. This is distinct from passive cooling which relies on design standards that do not require powered equipment.

Mobile clinics

Mobile health clinics providing primary health care, drug and mental health support, and/or heat check-ins for people who face healthcare barriers because they are unhoused, use emergency shelters, or have mobility and financial challenges.

Official Community Plan

Official Community Plan (OCP) refers the long-term, legally binding land-use planning document created by a municipality. Similar terminology includes Official Plan (OP), Municipal Development Plan (MDP), Municipal Planning Strategy (MPS), and Municipal Plan (MP).

Passive cooling

Passive cooling is one of the most effective ways to reduce indoor temperature, cut energy use, and improve resilience during extreme heat events, without relying on mechanical cooling (AC/Heat pumps). Commonly implemented passive cooling measures include cool roofs, external shading for windows, improved insulation and air sealing, low-E window films or windows, interior window shading (thermal blinds, curtains), natural ventilation, shade trees, and green facades.

Relevant data

Relevant data for managing heat risk includes meteorological records (temperature, humidity), climate projections, and health statistics (hospital visits, deaths) to identify risks from extreme heat, assess community vulnerability, and trigger public health warnings and response. It also includes data on heatwaves, urban exposure to heat, vulnerability populations, (e.g., elderly, low-income households, individuals living alone, chronic illnesses), and health outcomes, to understand health impacts and inform climate adaptation.

Standards

A standard is a document that provides guidelines, characteristics or requirements for products, processes, services or systems. Any person or organization can develop a standard. When a private business writes a standard, it is referred to as an industry or private standard. However, the development of a National Standard of Canada or International Standard occurs through tightly controlled processes, and these standards are developed by a committee or group of stakeholders and approved by a recognized body.

Standards establish accepted practices, technical requirements and terminologies in many different fields. Most standards aim to achieve optimum order or performance in a given context and are easy to recognize and reference.

Standards are voluntary by default but can become mandatory when enforced through laws, regulations, or contracts. Codes have a broad scope and are intended to carry the force of law when adopted by a provincial, territorial or municipal authority.

There are different types of standards, including:

- **Performance standards** – establish performance requirements or outcomes that products, processes, or services must meet, often demonstrated through testing, measurement, or other methods of verifying performance under specified conditions;
- **Prescriptive standards** – identify product characteristics such as material, thickness, type and dimension;
- **Design standards** – identify specific design or technical characteristics of a product;
- **Management system standards** – define and establish an organization's quality policy and objectives; and
- **Service standards** – specify requirements for services and establish that they are fit for use.

Susceptible populations

Susceptible populations include those that are at greater risk of harm from extreme because of:

- Social or material circumstances that increase their potential for exposure, impede their adaptive capacity, and/or compound their health risks (e.g., unhoused people, those living on low incomes, newcomers to the country, those working outdoors, racialized and Indigenous populations, and those living in social isolation and/or with mobility challenges); and
- Physiological reasons that make people more sensitive to extreme heat (e.g., young children, older people, pregnant women, people with chronic health conditions, and people using certain medications). (Derived from Berry P & Schnitter R (Eds). 2022.)

Thermal resilience

A building's ability to provide a safe thermal environment for occupants during disruptive events including extreme weather events and power outages (Siu et al., 2025).

Upper indoor temperature limit

An upper indoor temperature limit is a health-protective threshold used to reduce the risk of heat-related illness and death inside buildings. Health Canada recommends an upper indoor temperature limit of 26˚C to protect older adults, defined as people aged 60 and over, while noting that some individuals with severe frailty or multiple health conditions may require cooler conditions (Health Canada, 2026).

Urban forest and urban forestry

The urban forest is a collection of all trees, woody plants, and vegetation within urban areas. This includes street trees, residential trees, park forests, ravine systems, and all other woody vegetation across both public and private land (Tree Canada, n.d.). Urban forestry is the sustained planning, planting, protection, maintenance, and care of trees, forests, greenspace, and related resources in and around cities and communities for economic, environmental, social and public health benefits for people (Cayford, 1993).

To find out more:

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