

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

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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

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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, extreme heat continues to pose serious challenges and is increasingly affecting communities across Canada. Everyone can be affected by extreme heat, but some people face greater risks. Extreme heat can exacerbate existing social and health inequities and disproportionately affect:

- **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;**
- **individuals living on low incomes; and**
- **individuals experiencing homelessness.**

The 2021 heat dome in British Columbia, which caused 619 heat-related deaths, demonstrated the catastrophic consequences associated with extreme heat, especially for people who are older, isolated, or living in homes without cooling. Research also suggests that prolonged power outages can substantially increase the health impacts of extreme heat. Modeling of multi-day heat waves in three U.S. cities found that a concurrent citywide blackout could more than double estimated heat-related mortality, largely because of the loss of air conditioning and rising indoor temperatures.

Climate projections indicate that extreme heat events will increase 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 across a longer window of the year - starting earlier in the spring and summer, and persisting into the 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 reduce risk.

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).

Addressing extreme heat requires coordinated action across municipal departments and sustained collaboration with a wide range of external partners, including the local public health authority, community organizations, housing providers, energy utilities, provincial and territorial governments, federal agencies, and the private sector. Heat responsibilities are often distributed across these departments and 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 related questions 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.

A separate section covers provincial and territorial responsibilities that affect protection from extreme heat. Because these responsibilities fall outside municipal authority, they are not included in the municipal preparedness score.

1. Governance

Assesses leadership, risk management approach, coordination, funding, partnerships, data sharing, asset management and capital planning, and continuous improvement for sustained heat risk reduction.

2. Assessing 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 Training

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

4. Community Mobilization and Response

Considers pre-season coordination and heat 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 energy-efficient mechanical cooling and passive cooling measures.

7. New Buildings and Properties

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

8. Urban Design

Assesses how land-use planning, streets, parks, shade, greenspace, and development standards and incentives reduce heat exposure in outdoor spaces.

The scoring framework was developed through a collaborative process. The categories and assessment questions 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 the development of the tool and with a subset contributing to beta testing. This process strengthened the tool's rigour, usability, and practical relevance.

Each assessment question utilizes predefined performance level responses that 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. The assessment will generate preparedness scores that can be compared, 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).

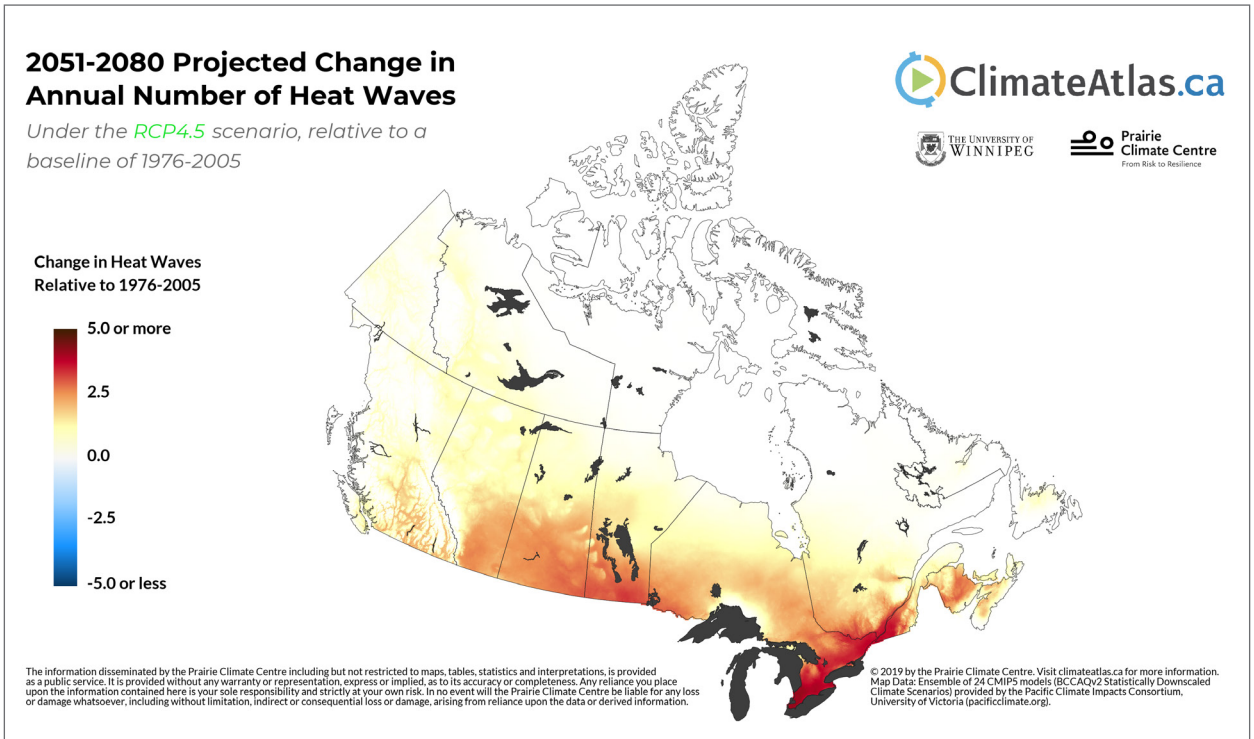


Figure 1: 2051-2080 projected change in annual number of heat waves, under RCP4.5 scenario, relative to a baseline of 1976-2005 (Source: climateatlas.ca)

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.

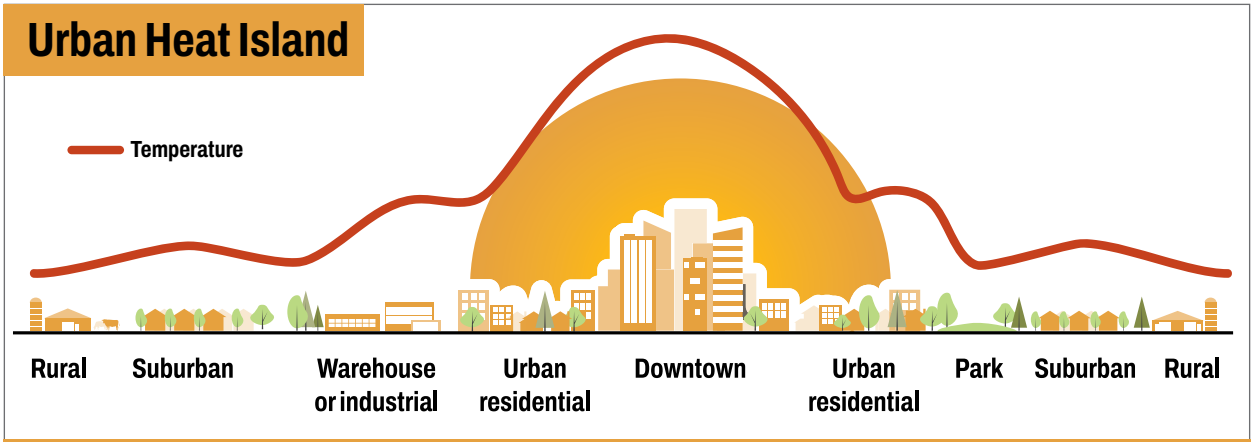


Figure 2: Urban heat island effect, showing higher temperatures in densely built areas and lower temperatures in greener suburban and rural areas.

1.2 Municipalities on the Front Lines

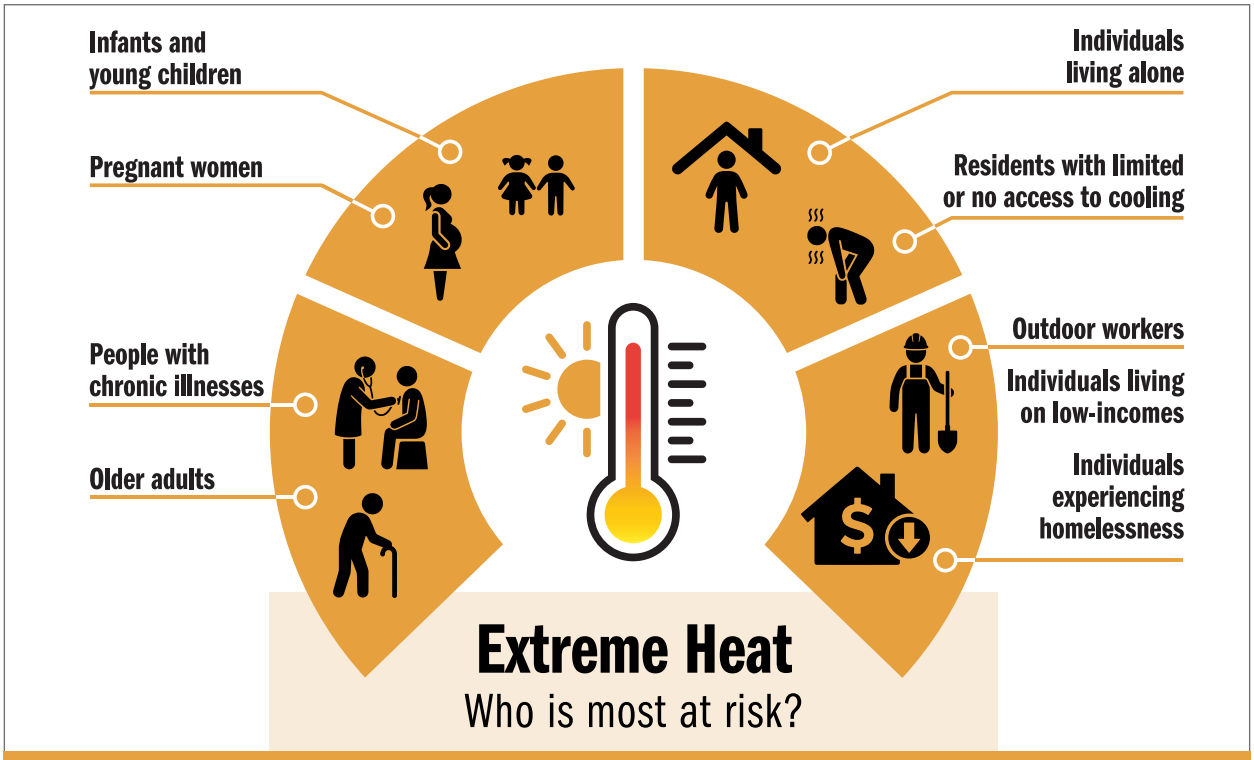
As temperatures rise and heat waves become more frequent, longer, and more intense, **municipalities are on the front lines of protecting residents.**



Extreme heat is manageable and heat-related illness and death can be prevented. However, extreme heat remains a major public health challenge, disproportionately affecting people whose health, age, income, or living conditions limit their ability to stay safe.

Extreme heat can affect everyone; however, certain groups face significantly higher risk of heat-related illnesses and death, 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;
- individuals living on low-incomes; 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, legal mandates, 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 understanding 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.

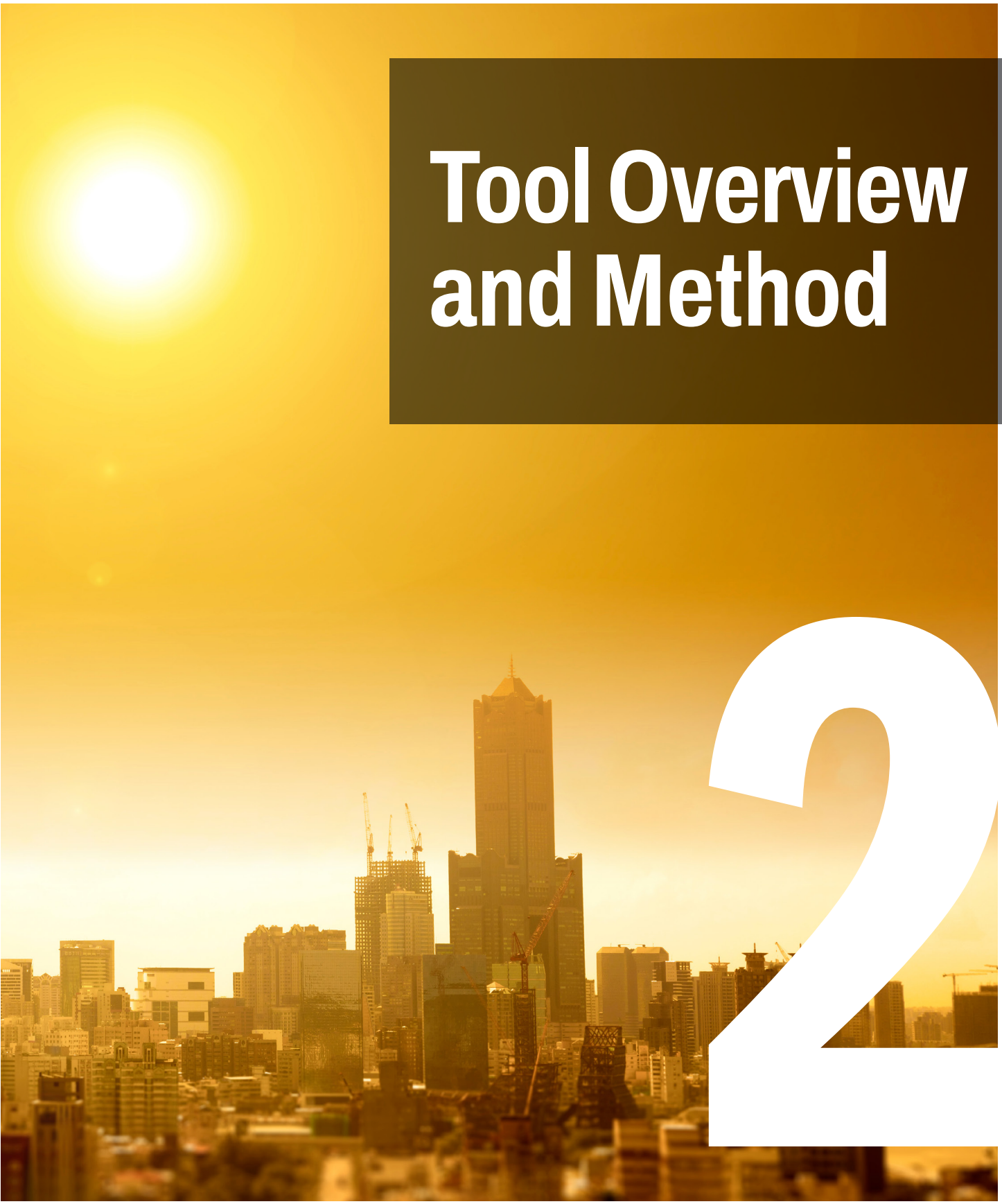
Given the breadth of partners and sectors involved, and the varying levels of maturity across different initiatives, **municipalities need a practical, standardized method to take stock of their efforts in a consistent and comprehensive manner**. A scoring-based assessment can support this process by 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 et al., 2023). 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).

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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 Heat Health Risk
3. Heat Alerts, Communication, and Training
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 Sections 2.5 and 2.6.

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 fundamental 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 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).

Recent experience shows what these vulnerabilities mean in practice. 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). Without assessments that identify where at-risk populations live and what supports they need, these populations are easily overlooked in planning and response.



3. Heat Alerts, Communication, and Training

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).

Heat-related health outcomes are strongly influenced by timely warnings, behavioural responses, and adaptive actions. As such, 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



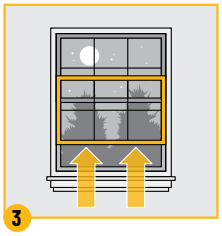
1

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



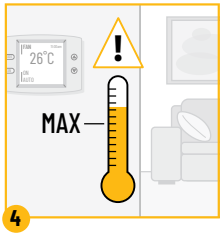
2

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.

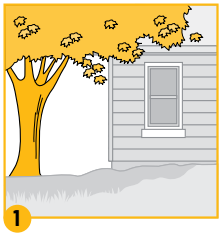


5

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

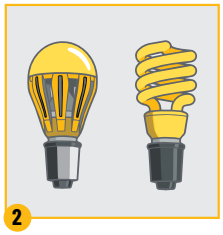
Step 2: Complete simple upgrades

Do-it-yourself, for under $500



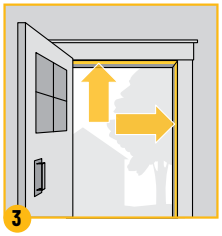
1

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



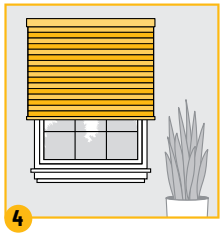
2

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



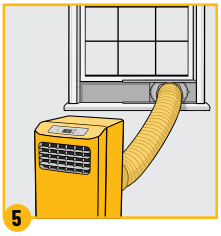
3

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.

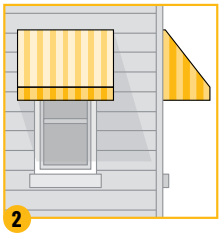
Step 3: Complete more complex upgrades

Work with a contractor, for over $500



1

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



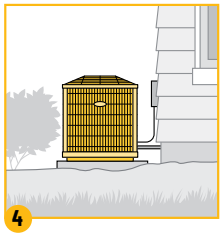
2

Shade windows with outdoor shutters and awnings.



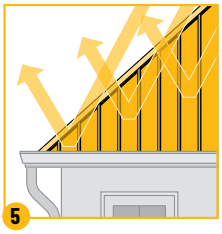
3

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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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, people who are socially isolated, and others who cannot easily find or reach a cool place on their own (Bassil & Cole, 2010; Toloo et al., 2013).

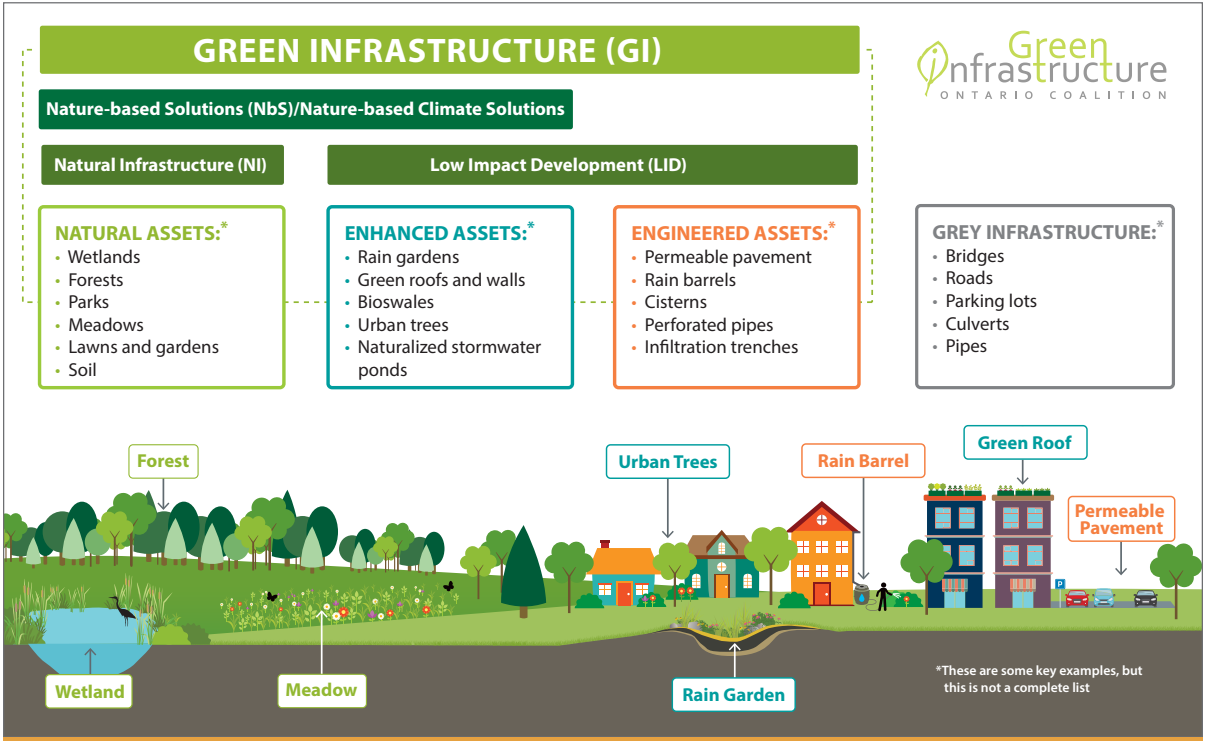
Including community mobilization and response as an assessment category recognizes that heat outcomes depend on local capacity to translate warnings into protective action. Municipalities that invest in sustained community partnerships and coordinated response mechanisms are better positioned to support 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, health and social benefits, including 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 susceptible 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, including homes and other residential buildings, involves modifying them to reduce peak indoor 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.

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).



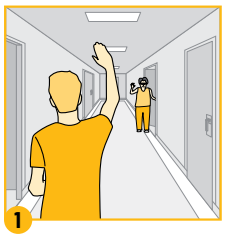
Including existing buildings as an assessment category recognizes that indoor conditions are a major determinant of heat-related illness and death. Assessing building retrofits, access to cooling, tenant protections, long-term care requirements, and backup power provides insight into whether existing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

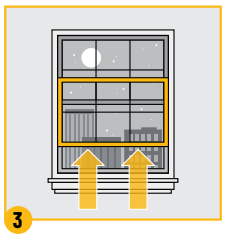
Do-it-yourself, $0-$100



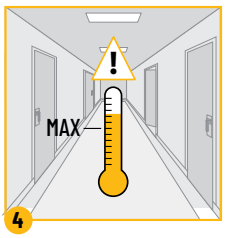
1 Help vulnerable neighbours, family, friends prepare and arrange to check on them during heat events.



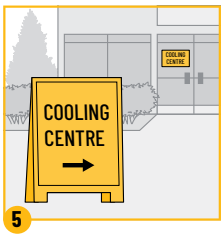
2 Sign up for heat alerts on your phone (e.g., WeatherCan, Alertable).



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



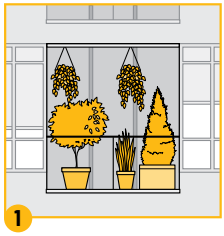
4 Monitor indoor temperature to protect residents from unsafe heat.



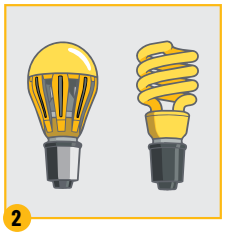
5 Arrange to spend time in a cooler space (e.g., shared cooling space).

Step 2: Complete simple upgrades

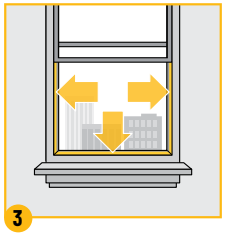
Do-it-yourself, for under $500



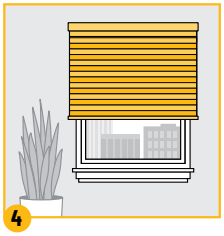
1 Green your balcony or deck with potted, hanging and climbing plants.*



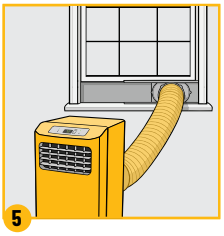
2 Choose energy efficient lights that produce less "waste" heat.



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



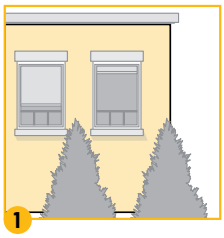
4 Install blinds, heat-resistant curtains, or films on windows.



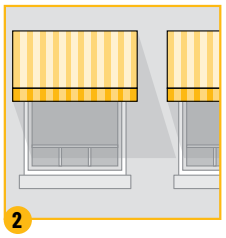
5 Use a portable AC to help increase air circulation.

Step 3: Complete more complex upgrades

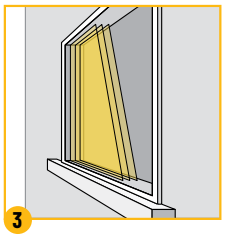
With building managers, for over $500



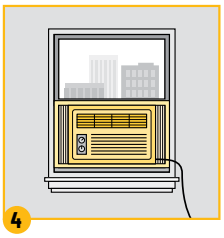
1 Paint unit walls with white paint or light colours.



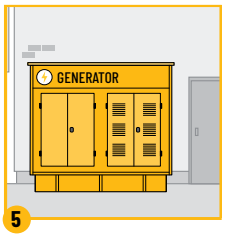
2 Shade windows with outdoor shutters and awnings.



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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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 indicates whether future development is likely to 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, human behaviour, and public health. 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). They also influence transportation choices, which can in turn affect outdoor temperatures (Husni et al., 2020), air quality, levels of physical activity, transportation costs, and physical and mental health (Perrotta, 2023).

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).

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.

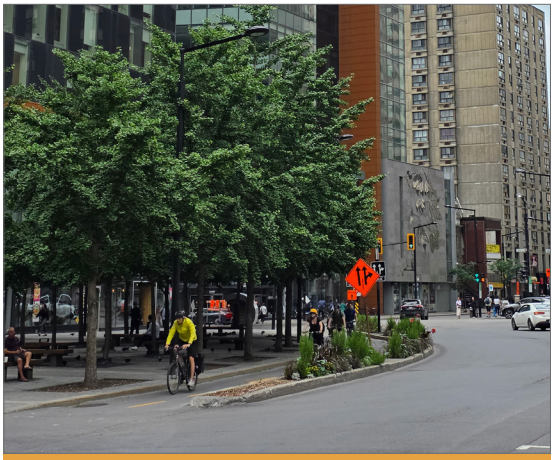


Photo: Dr. Anabela Bonada, Intact Centre on Climate Adaptation

2.4 Provincial and Territorial Actions Supporting Extreme Heat Protection

Several policy areas that affect protection from extreme heat fall under provincial and territorial authority rather than municipal jurisdiction. These include occupational health and safety, residential tenancy requirements, building codes, and regulation of long-term care homes. Municipal preparedness therefore represents only one component of a broader system of protection.

To address some of the most direct provincial and territorial protections, the assessment includes four additional questions on:

- protections for workers exposed to extreme heat;
- maximum indoor temperature requirements in rental housing;
- cooling requirements for long-term care homes; and
- backup power requirements for multi-unit residential buildings (MURBs).

These questions are assessed separately from the eight municipal preparedness categories and do not contribute to the overall municipal score. This approach provides additional context while ensuring that municipalities are not penalized for gaps in provincial or territorial policies.

The importance of these broader protections is illustrated by indoor temperature requirements and backup power provisions for multi-unit residential buildings. Health Canada recommends an upper indoor temperature limit of 26˚C to protect older adults from heat-related illness and death (Health Canada, 2026). While provinces and territories have not adopted this limit in legislation for houses or rental apartments, some municipalities have introduced their own protections. For example, New Westminster, British Columbia has adopted a bylaw requiring landlords to maintain at least one room at or below 26˚C overnight during summer months (Vanderdeen, 2026).

Similarly, prolonged power outages during extreme heat can disrupt cooling, ventilation, water supply, and elevator access in MURBs, increasing risks to residents. Modeling research indicates that heat-related mortality can more than double when a multiday blackout coincides with heat-wave conditions (Stone et al., 2023). Yet building codes and standards generally require backup power only to support emergency evacuation, not to protect occupants during prolonged outages. Toronto's voluntary Minimum Backup Power Guidelines for MURBs, introduced in 2016, offer one example of a municipality helping to close this gap (City of Toronto, 2016). However, a voluntary municipal measure such as this cannot substitute for binding provincial or territorial requirements.



72 hrs

minimum runtime of backup power recommended for multi-unit residential buildings.

2.5 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, address the needs of susceptible populations, and minimize 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 2.6). 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.

2.6 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.

The measures reflected in the scoring framework are illustrative indicators of preparedness selected for assessment purposes. They do not constitute legal recommendations and may not be appropriate or available in every jurisdiction.

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 Acknowledgments). 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.



2.7 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. Performance levels in this assessment are presented in descending order, from highest (A) to lowest (E), to maintain consistency with the Intact Centre's other published assessments of flood and wildfire preparedness. This differs from other climate adaptation and resilience assessment tools, which present performance levels in ascending order (lowest to highest), reflecting a progression from basic to advanced practice. Users may find it easier to score their municipality's actions by starting at E and working up to A.

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.

The provincial and territorial questions use the same A-E answer choices but questions are not included in the category or overall score. Responses to these questions provide context on protections that affect heat risk in the municipality, but fall largely outside its control.



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

Questions 1.1-1.7 were informed by the 2025 Extreme Heat Risk Governance Framework and Toolkit, developed jointly by the United Nations Office for Disaster Risk Reduction (UNDRR), the World Meteorological Organization (WMO), and the Global Heat Health Information Network.

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 during 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. The strategies incorporate future climate projections and health equity considerations. Progress is monitored, and the approach is reviewed and updated over time.
B	**Heat Action Plans** (covering both short-term heat response and long-term heat risk reduction) are developed and implemented, and the heat alerting system is strengthened to better reach populations susceptible to harm 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 fosters 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	Collaboration is informal and occurs on a project-by-project or pilot study basis, **involving some** departments and occasional partnerships 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 (e.g., meteorological and climate data, outdoor temperature, health data, exposure, and socio-demographic data, etc.) shared to support decision making?

SCORE	DESCRIPTION
A	Data is shared through **centralized systems that support 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 health risks.
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.

1.8 How systematically does the municipality integrate extreme heat hazard data, full life-cycle costing, and equity-based vulnerability mapping into its asset management and capital planning processes?

SCORE	DESCRIPTION
A	In addition to B, the municipality **uses future climate projections** (not just historical data) to determine asset vulnerability. Capital planning directly integrates equity/vulnerability mapping (e.g., prioritizing low-income or high urban heat island (UHI) neighbourhoods), and the municipality actively tracks and adjusts the performance of these investments over time.
B	The municipality **systematically factors extreme heat into asset registries**. This includes both engineered cooling assets (HVAC, cool roofs) and natural assets/green infrastructure (canopy, parks) within its AMP as part of life-cycle planning (e.g., maintenance, rehabilitations, upgrades and replacements). Capital budgets include dedicated lines or explicit 'heat-resilience weighting' in project prioritization scoring.

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SCORE	DESCRIPTION
C	The AMP **contains high-level commitments** to climate adaptation or general resilience. However, heat resilience is not tied to technical levels of service (LOS) metrics, life-cycle renewal planning, or specific capital projects/sub-projects.
D	The municipality **acknowledges** extreme heat as a corporate risk or infrastructure hazard, but has no formal mechanism to track, fund, or address it in asset life-cycles.
E	The municipality **has not considered** extreme heat resilience in its asset management plans (AMP) or capital budgeting process.



2. Assessing 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** every five to ten years to reflect new data, shifts in population susceptibility, 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 authority and community partners such as schools, childcare facilities, long-term care facilities, and hospitals, and community organizations that serve or represent susceptible populations, to conduct a heat-health vulnerability assessment with guidance from Health Canada's resources. The assessment identifies: ▪ high heat exposures encountered indoors and outdoors across the community; ▪ situations in the community that put people at high risk of harm from extreme heat; ▪ populations and neighbourhoods at greatest risk of heat-related harm; ▪ neighbourhoods that lack cooling amenities; and ▪ local actions that can be taken to reduce exposure, strengthen preparedness, and protect people at greatest risk during extreme heat events.
C	The municipality has worked with the local public health authority to **assess and map outdoor temperatures and susceptible populations across the community**. Using tools such as the HealthyPlan.City, Climate Insight, or in-house geospatial tools the municipality has identified: ▪ areas in the community with higher outdoor temperatures; ▪ neighbourhoods where higher outdoor temperatures coincide with a high concentration of one or more susceptible populations; and ▪ the location of community amenities such as community centres, libraries, pools, splash pads and parks, that could be used by residents for respite from extreme heat.

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SCORE	DESCRIPTION
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 heat-health risks.

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



3. Heat Alerts, Communication, and Training

3.1 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 the local public health authority, 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; and ▪ are delivered by people who are trusted by the various susceptible populations.
C	The municipality has worked with the local public health authority, 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 neighbours 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.

3.2 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, in consultation with employees and/or their representatives, has identified: ▪ the protocols needed to keep employees safe during extreme heat, such as flexible schedules, more frequent breaks, access to drinking water and cooling stations, and ice vests; ▪ the tasks, situations, and/or positions that are subject to various heat protocols; ▪ how the protocols will be enforced; and ▪ the actions to be taken if an employee experiences symptoms of heat stress. The municipality has also trained municipal employees on: ▪ the protective actions they can take for themselves, colleagues, family members, and members of the public.
D	The municipality, in consultation with employees and/or their representatives, is assessing the potential for heat exposure across different types of work conducted by municipal employees to identify the protocols needed to protect workers from extreme heat.
E	The municipality **has not developed** protocols or training to protect municipal employees from extreme heat.

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 the local public health authority, community partners and community organizations to review implementation of the community response plan during the heat season and identify improvements for future heat seasons. **Findings are documented and used to inform work in the next year.**
B	In addition to levels C and D, during extreme heat, the municipality and its partners **provide susceptible populations with**: ▪ free transit passes and/or mobile vans that provide rides to cooling centres that provide seating, bathrooms and water; ▪ pop-up cooling hubs with shade, ice and drinking water in under-serviced neighbourhoods with susceptible populations or unhoused populations; and ▪ extended access to cooling amenities such as swimming pools, community centres, and cooling rooms in apartment buildings.
C	The municipality **has developed a community response plan** and convenes pre-season meetings with the local public health authority, 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 the local public health authority, 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 health and 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 the local public health authority, and community partners and organizations to review implementation of the heat check-in program, identify improvements for future heat seasons, and update the program based on lessons learned.
B	The municipality, in conjunction with other levels of government (provincial/territorial/federal), **provides grants and support** to community groups to train and coordinate volunteers who check in on individuals at high risk 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 the local public health authority, 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-related health risks?

SCORE	DESCRIPTION
A	In addition to the actions described in C and B, the municipality has **a comprehensive strategic urban forest program** that includes: ▪ a fully implemented, data-driven program designed to reduce heat-related health risks, with equity-focused tree planting; ▪ integration with climate plans, resilience strategies, and land-use planning policies (e.g., the official community plan, or equivalent plan, is supported by high-performance development standards or green building standards that require tree protection or planting as part of new development); ▪ long-term funding mechanisms; ▪ regular monitoring and assessment of the tree inventory and canopy; and ▪ annual reporting on progress toward established targets.
B	A **formal urban forest program** is established. Building on C, it includes: ▪ interdepartmental coordination (e.g., Planning, Public Works, and Parks); ▪ an inventory of existing trees; ▪ operational processes for planting, maintenance, protection during development, and removal where necessary; ▪ prioritization of neighbourhoods with high temperatures and high concentrations of one or more susceptible populations; ▪ a workplan with milestones and timelines; ▪ dedicated staff and annual funding; ▪ engagement with external funders; and ▪ routine partnerships with community groups, utilities, NGOs, or researchers. For private property, the municipality also: ▪ promotes tree planting; ▪ has bylaws that prohibit the removal of trees above a specified diameter without approval or a permit; and ▪ provides free shade trees to residents for planting.
C	An urban forest strategy or plan **is being developed** in consultation with the local public health authority, residents, community partners, community organizations that serve or represent susceptible populations, and other relevant partners. Development and consultation include: ▪ recognition of the benefits of urban greening; ▪ consideration of how a warming climate will affect the health of the urban forest over time; ▪ confirmation of existing tree canopy coverage; and ▪ targets for increasing tree canopy. The municipality also provides education to private property owners on the benefits of greening their properties, including health benefits, energy savings, and heat reduction.

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SCORE	DESCRIPTION
D	The municipality undertakes **some informal or ad hoc** tree-related activities, including: ▪ high-level measurement of tree canopy coverage; ▪ some planting, planning, protection, or maintenance activities that are project based or limited to specific departments, such as Parks, Roads, or Public Works; and ▪ early pilot initiatives, such as neighbourhood tree planting, school partnerships, or collaboration with community groups.
E	**No urban forest program** or coordinated tree-related activities are in place.



5.2 How does the municipality use green infrastructure along street rights-of-way and public lands for stormwater management and cooling co-benefits?

SCORE	DESCRIPTION
A	In addition to B, the municipality has a comprehensive, strategic "green streets" infrastructure program that **is regularly monitored, evaluated, and improved. Progress is tracked and reported, and long-term funding mechanisms are in place** to support implementation and expansion.
B	The "green streets" strategy, plan, or approach developed in C **is established and being implemented**. Implementation prioritizes neighbourhoods at high risk of urban flooding, with high heat exposure, and with high concentrations of populations at risk of harm from extreme heat. It includes: ▪ alignment with existing plans, such as the official community plan, stormwater master plan, or urban forest strategy; ▪ design standards and guidelines; ▪ prioritization of neighbourhoods at high risk of urban flooding, with high heat exposure, and with high concentrations of one or more susceptible populations; ▪ defined responsibilities and coordination across municipal departments responsible for programs such as transportation services, land-use planning, climate adaptation, and stormwater management, and with partner organizations; and ▪ an implementation plan with timelines and budgets. For private property: ▪ incentives (e.g., tax relief, grants, rebates) are offered to retrofit private property with green infrastructure to better manage stormwater and provide cooling and other co-benefits.
C	The municipality **is developing** a "green streets" strategy, plan, or approach for using green infrastructure to address stormwater flooding and climate risk on street rights-of-way and public lands. This is being done in consultation with the local public health authority, community partners, community organizations that serve or represent susceptible populations, residents, and other stakeholders. Consultation and development include: ▪ recognition of the benefits of green streets, such as managing stormwater, reducing urban heat, and improving air quality; ▪ criteria to inform prioritization of project locations; ▪ input on the types of green infrastructure to be implemented (e.g., bioswales, engineered wetlands, rain gardens, permeable pavement); and ▪ consideration of accessibility and safety for pedestrians, cyclists, and people with mobility challenges. The municipality has run education programs for the private sector on the value of green infrastructure for stormwater management and cooling, noting that while there is a genuine cooling co-benefit, it is generally more modest than the cooling provided by urban tree canopy.

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SCORE	DESCRIPTION

D	The municipality **is exploring opportunities** for green infrastructure for stormwater management and cooling co-benefits.
	
	This may include:
	▪ initial research, scoping, and staff discussions;
	▪ early pilots that may include:
	  ▪ small-scale green infrastructure projects, such as rain gardens that include a mix of trees, flowers, shrubs, and grasses; bioswales; and tree trenches in the public right-of-way; and
	  ▪ larger green infrastructure practices, such as constructed wetlands, permeable pavements, holding ponds, and subsurface stormwater storage on public properties;
	▪ partnerships with the local public health authority, community partners, researchers, and/or private sector organizations; and
	▪ recognition of co-benefits, including water management and cooling.

E	The 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. In addition to elements in B, and C, the program also: ▪ 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. This applies only to municipalities with a high proportion of low-slope or no-slope roofs.
B	A **formal cool roof policy and design guidelines and standards** have been developed to guide retrofits for existing municipally owned buildings. Implementation is underway across municipal buildings. The policy, standards, and guidelines include: ▪ assessment of all eligible municipal buildings for cool roof retrofits; ▪ prioritization of building types or areas of the city where cool roofs would have the greatest impact (neighbourhoods with high exposure, buildings without cooling, or facilities serving susceptible populations); ▪ implementation plan with timelines and budgets; ▪ guidance, training, and procurement pathways for staff to support implementation; and ▪ integration of cool roofs into broader climate adaptation, energy management, and/or heat-risk reduction strategies. 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.

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SCORE	DESCRIPTION
C	The municipality is **developing** an approach for cool roofs, for municipally owned buildings. This is done in consultation with the local public health authority, community partners, community organizations that serve or represent susceptible populations, residents, and other stakeholders. The consultation and development include: ▪ recognition of the benefits of cool roofs, such as reducing urban heat, lowering building cooling costs and energy use, and improving comfort and safety during extreme heat events; ▪ one or more pilot cool roof retrofits that may be underway or completed on selected municipal buildings; ▪ input on guidelines, performance, and construction standards; and ▪ input on the prioritization of neighbourhoods and buildings. 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 energy-efficient mechanical cooling and/or passive cooling strategies, beyond cool roofs?

SCORE	DESCRIPTION
A	In addition to the actions described in B, **a comprehensive, strategic program with continuous improvement is in place**. The program includes: ▪ regular monitoring and assessment; ▪ reporting on progress; and ▪ dedicated multi-year funding. Financial incentives are also extended to low-income households and privately owned, low-income multi-unit residential buildings (MURBs). The program includes: ▪ a reasonably simple application process; ▪ multilingual materials; ▪ prioritization of low-income households and buildings; ▪ clear and simple eligibility criteria, including automatic enrolment where appropriate for households already participating in income-qualified programs; and ▪ timely release of funds and approvals.
B	Building on C, the municipality **is actively upgrading** existing municipally owned buildings, including long-term care facilities, to improve heat resilience through passive cooling strategies and energy-efficient mechanical cooling, such as high-efficiency heat pumps. General energy-efficiency, low-carbon, and/or renewable energy upgrades may also be supported. The initiative includes: ▪ alignment with existing municipal plans and strategies; ▪ standards and guidelines for building upgrades; ▪ an implementation plan with timelines and budgets; ▪ prioritization of buildings with high heat exposure and/or high concentrations of populations at risk of harm from extreme heat; and ▪ defined responsibilities and coordination across municipal departments and with relevant partner organizations. The municipality also provides financial incentives, such as rebates or grants, to support passive and mechanical cooling upgrades in other publicly owned and non-profit buildings that serve the community, including affordable, supportive, and cooperatively owned housing, long-term care homes, health care facilities, and schools. Examples of upgrades are provided in D.

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SCORE	DESCRIPTION
C	Building on D, the municipality **is developing a plan** to upgrade existing municipally owned buildings, including long-term care facilities, to improve heat resilience through passive cooling strategies and energy-efficient mechanical cooling. General energy-efficiency, low-carbon, and/or renewable energy upgrades may also be considered. The plan is being developed in consultation with relevant municipal departments, the local public health authority, the health and long-term care sector, the housing and building sector, technical and industry experts, community partners, community organizations that serve or represent susceptible populations, residents, and other orders of government and funders. Consultation and development include: ▪ recognition of the benefits of upgrading existing buildings for heat resilience; ▪ identification of eligible or feasible upgrades; examples of upgrades are provided in D; ▪ prioritization of building types and facilities; and ▪ consideration of funding models and incentives.
D	The municipality **is exploring opportunities** to upgrade existing municipally owned buildings, including long-term care facilities, to improve heat resilience through passive cooling strategies and energy-efficient mechanical cooling. This may include: ▪ research into passive and mechanical cooling strategies suitable for different building types and conditions; ▪ internal staff discussions on scope, feasibility, and cost; ▪ early identification of priority buildings or facilities; and ▪ one or more pilot projects to test specific cooling strategies. Examples of upgrades include: ▪ heat pumps for space heating and cooling; ▪ HVAC upgrades, such as improved ventilation, smart controls, variable-speed components, zoning systems, and individual room cooling; ▪ building envelope upgrades, such as weather stripping and air sealing; ▪ windows and doors designed to reduce solar heat gain; ▪ external shading, such as shutters, awnings, and solar screens; ▪ interior shading, such as blinds and cellular or roller shades; ▪ energy-efficient lighting; ▪ renewable energy systems, such as solar photovoltaic panels; and ▪ building electrification when replacing existing gas-fired equipment.
E	**No effort or support exists** to upgrade existing buildings with energy-efficient mechanical cooling and/or passive cooling strategies beyond cool roofs.

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 reduce energy use, costs, and emissions?

Note: Levels A–C assume that the province/territory allows municipalities to establish building standards that exceed provincial/territorial building code requirements.

SCORE	DESCRIPTION
A	The municipality **monitors and reports** on the implementation and effectiveness of mandatory standards that support heat-resilient design and construction in new buildings and updates them based on new data, technology, and heat-risk projections to support continuous improvement.
B	Building on C, **mandatory standards have been adopted and are actively enforced** through development approvals, permit reviews, and inspections. Examples of measures that may be implemented include: ▪ high-performance, low solar heat-gain glazing; ▪ enhanced building envelope insulation and reduced thermal bridging; ▪ airtightness and building envelope leakage testing; ▪ operable exterior solar shading; ▪ operable windows and natural ventilation; ▪ cool roofs, green roofs, and solar power generation; ▪ high-efficiency HVAC systems, including heat pumps; ▪ energy recovery ventilation or heat recovery ventilation systems; ▪ 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 or light-coloured paving and landscaping materials; and ▪ other measures that improve building thermal performance and heat resilience.
C	The municipality **is developing standards or guidelines** that go beyond building code requirements to improve the performance of new building projects, including thermal safety, heat resilience, energy efficiency, and/or emissions reduction. These standards may be termed “High Performance Development Standards,” “Green Building Standards,” or another similar term. Development is undertaken in consultation with relevant partners, including the local public health authority, municipal departments, community organizations serving or representing susceptible populations, residents, utilities, the development and construction industry, design and technical professionals, affordable and non-profit housing providers, and the provincial/territorial government.

(continued on next page)

SCORE	DESCRIPTION
D	**Extreme heat is explicitly recognized as a climate and health hazard** and priority issue in the municipality's official community plan or equivalent plan. The plan calls for improving heat resilience in the built environment, but no standards or municipal requirements for heat-resilient design and construction in new buildings have been formally developed.
E	The municipality **meets provincial/territorial building code requirements** for the construction of new buildings.



8. Urban Design

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

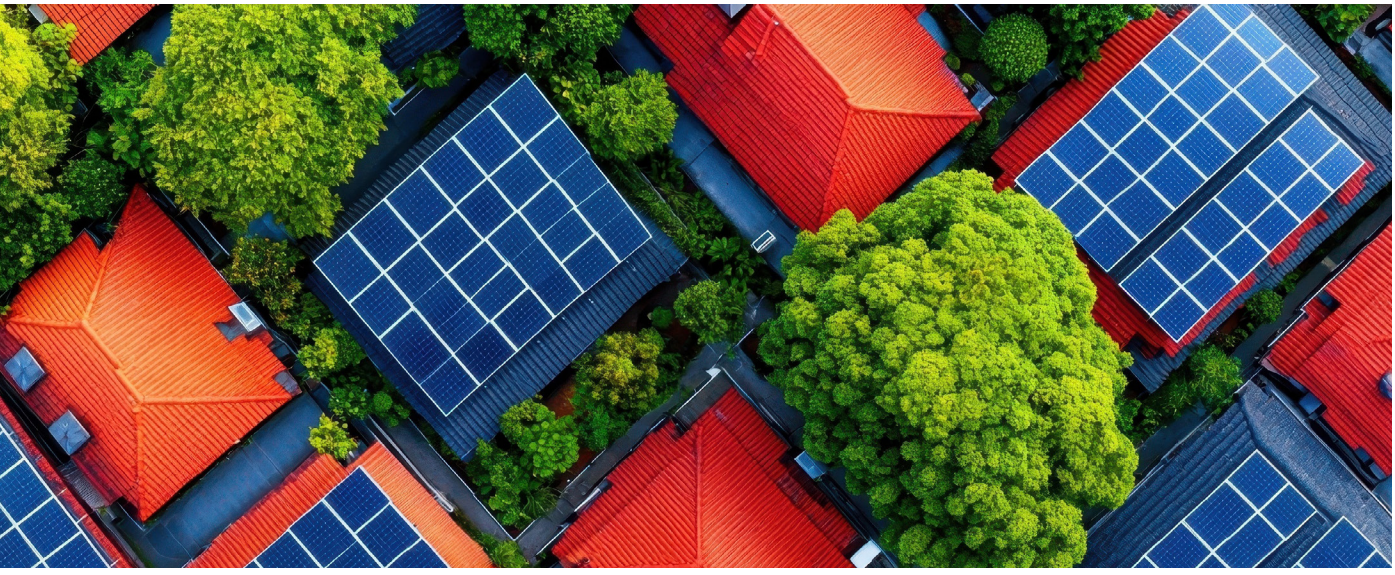
SCORE	DESCRIPTION
A	The municipality **enforces the heat-related goals** in its high-level and implementation policies and plans when reviewing road construction or reconstruction plans, subdivision plans and site plans. It tracks the results and reports on them to council on a regular basis.
B	In addition 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** the local public health authority, 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 the official community plan.
E	The municipality **has not addressed** extreme heat or heat resilience in its high-level policy documents such as the official community plan.

8.2 How does the municipality ensure equitable access to parks, green space, and cooling amenities across neighbourhoods?

SCORE	DESCRIPTION
A	In addition to D, C and B, 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 city 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 the local public health authority, community partners, 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 an official community plan.
E	The municipality **has not addressed** extreme heat or heat resilience in its high-level policies such as the official community plan.

8.3 How does the municipality reduce heat in privately owned spaces that are open to the public, such as plazas, walkways, and parking lots?

SCORE	DESCRIPTION
A	In addition to D, C and B, the municipality **enforces the heat-related goals** in these policies 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 the local public health authority, 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 the official community plan.



8.4 To what extent has the municipality incorporated heat-resilient design and materials into its road, sidewalk, and active transportation infrastructure?

SCORE	DESCRIPTION
A	The municipality **has a well-established program** for incorporating heat-resilient design and materials into new and upgraded roadways, high-use pedestrian corridors, and active transportation routes, particularly in neighbourhoods with high heat exposure and high concentrations of populations at risk of harm from extreme heat. Progress is tracked and reported.
B	The municipality **has adopted design and material standards or guidelines** requiring heat-resilient materials, such as high-albedo or reflective surfaces and permeable pavement, in new and reconstructed roads, sidewalks, and active transportation routes. Implementation is underway.
C	The municipality **has identified opportunities and is developing policies** to incorporate heat-resilient measures, such as reflective or permeable pavement, into future infrastructure projects. Development has included consultation with relevant partners, such as the local public health authority, residents, municipal departments, transit agencies or operators, community organizations serving susceptible populations, utilities, active transportation and accessibility advocates, and engineering and technical experts. Implementation has been limited or pilot-scale.
D	The municipality **recognizes** that heat-resilient design and materials should be considered in transportation infrastructure and has incorporated this direction into its Transportation Master Plan or equivalent plan.
E	The municipality **has not considered** heat-resilient design and materials in its road, sidewalk, or active transportation infrastructure.

Provincial and Territorial Actions Supporting Extreme Heat Protection

4



The following questions assess provincial and territorial actions to protect residents from extreme heat. They also highlight opportunities for provinces and territories to complement municipal efforts and strengthen community resilience. These questions are numbered with the prefix "PT" (province/territory) and are not included in the municipal preparedness score.

PT-1

What steps has the province/territory taken to protect workers from heat-related health risks?

DESCRIPTIONS

In addition to B, C, and D, the provincial/territorial OHS legislation and heat-related standards or guidelines apply to all employers in the community, except those with very few workers, and to all categories of employees including permanent, part-time, contract workers, and migrant workers.

SCORE **A**

In addition to C and D, provincial/territorial OHS legislation and related standards or guidelines **require employers**, in consultation with workers and/or their representatives, **to consolidate these measures into a formal, written heat stress prevention** plan that includes:

- identification of jobs that place workers at increased risk of heat-related health impacts;
- actions to reduce heat exposure for workers in both indoor and outdoor environments, such as shade, ventilation, and scheduling outdoor or high-exertion work outside peak heat hours;
- protocols such as flexible work schedules, frequent rest breaks in cool or shaded areas, access to drinking water, and cooling aids such as ice vests;
- acclimatization protocols for workers who are new to heat exposure or returning after time away;
- monitoring of workplace temperature or heat-stress conditions, with defined thresholds that trigger additional protections; and
- training for workers and supervisors on the heat stress prevention plan and the measures and protocols it establishes.

SCORE **B**

In addition to D, provincial/territorial OHS legislation and related standards or guidelines **require employers**, in consultation with workers and/or their representatives, **to assess potential exposure to hazardous levels of heat** for workers in different positions, both indoors and outdoors.

The assessment considers factors such as air temperature, humidity, and radiant heat and uses the Humidex-Based Heat Stress Response Plan produced by the Occupational Health Clinics for Ontario Workers, or an equivalent heat-stress assessment tool.

SCORE **C**

Provincial/territorial OHS legislation **requires employers to provide basic training** on heat exposure, heat-related health effects, and first aid responses to heat stress.

SCORE **D**

The province/territory has occupational health and safety legislation, but it **does not include specific requirements for assessing and managing heat exposure**.

SCORE **E**

PT-2

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

DESCRIPTIONS

The province/territory **has legally declared cooling to be a vital service for tenants**, analogous to heat, electricity, or water, **and has established a legal maximum indoor temperature baseline standard**. The standard specifies the maximum temperature and the period of time over which it applies, applies province/territory-wide, and is aligned with health-protective guidance, including Health Canada's recommended 26˚C upper indoor temperature limit for older adults.

The municipality **may also have implemented a maximum indoor temperature bylaw** that is stricter than the provincial/territorial standard to reflect local climate needs. The bylaw establishes the maximum temperature permitted in rental units over a defined period of time.

Enforcement is typically complaint-driven, with tenants reporting non-compliance to a municipal bylaw or property standards office. This may be supplemented by proactive inspections of vulnerable or larger rental buildings. Compliance is tracked and reported.

SCORE **A**

In addition to C, the province/territory **has legally declared cooling to be a vital service for tenants**, analogous to heat, electricity, or water, and **has established a legal maximum indoor temperature baseline standard**. The standard specifies the maximum temperature and the period of time over which it applies, applies province/territory-wide, and is aligned with health-protective guidance, including Health Canada's recommended 26˚C upper indoor temperature limit for older adults.

The municipality **may also be developing** a maximum indoor temperature bylaw that would establish a stricter maximum temperature or different period of application to reflect local climate needs. Development is informed by climate records and projections and consultation with tenants, landlords, advocacy groups, and other stakeholders.

The municipality also **extends the province/territory's subsidized air-conditioning program** described in C to low-income renters, regardless of health status, by providing or contributing funding to support expanded eligibility.

SCORE **B**

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DESCRIPTIONS

In addition to D, provincial/territorial **legislation** to declare cooling a vital service for tenants and establish a maximum indoor temperature baseline standard is **actively being developed** in consultation with relevant stakeholders.

The province/territory **provides subsidized air conditioners** to people with chronic health conditions who are living on low incomes. Eligibility is streamlined for individuals already enrolled in relevant provincial or territorial income- and health-tested programs.

The municipality **requires landlords to allow tenants** to install their own portable or window cooling units, where appropriate, and/or requires at least one shared cool common space in multi-unit residential buildings that lack in-suite cooling.

The municipality has also **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.

SCORE **C**

There is **no provincial/territorial action to declare cooling a vital service for tenants or establish a legal maximum indoor temperature baseline standard.**

The municipality **has established an education program for landlords and tenants** that provides voluntary guidance on extreme heat risks and cooling strategies but does not include binding requirements. Guidance may address passive cooling strategies, signs of heat-related illness, and actions landlords can take to protect tenants at greater risk during extreme heat events. The guidance and education are developed in consultation with the local public health authority, tenants, landlords, community partners, and community organizations.

The municipality **is also investigating concerns about high indoor temperatures in rental units** and consulting with relevant partners about actions it can take to protect renters from unsafe indoor temperatures.

SCORE **D**

No provincial/territorial action has been taken to declare cooling a vital service for tenants, analogous to heat, electricity, or water, and no provincial/territorial maximum indoor temperature baseline standard for tenants is in place.

SCORE **E**

PT-3

To what extent has the province/territory established legally binding mechanical cooling requirements for long-term care homes and resident rooms?

DESCRIPTIONS

In addition to B, **the provincial/territorial requirement for mechanical cooling is fully operationalized** across all long-term care homes, including public, non-profit, private, and mixed-management homes.

Performance standards, verification measures, and enforcement mechanisms have been developed through continued consultation with long-term care operators, local public health authorities, and other stakeholders.

These include:

- 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 compliance through inspections, audits, and transparent public reporting;
- 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.

SCORE **A**

In addition to C, **the legal requirement has been expanded**, through the same regulatory or legislative development process, to individual resident rooms as well as shared cool spaces, so that every long-term care home is required to provide cooling throughout the facility. Development of this expansion involved consultation with long-term care operators, health authorities, and other stakeholders.

Implementation is underway but not yet complete:

- many long-term care homes have implemented the required cooling;
- some homes are still transitioning or awaiting upgrades;
- some homes face technical or capacity barriers, such as outdated electrical infrastructure; and
- funding to support upgrades may be available.

SCORE **B**

The province/territory **has established a legally binding requirement** for mechanical cooling in long-term care homes, developed through the jurisdiction's standard regulatory or legislative process, including public and/or stakeholder consultation.

However, the requirement applies only to designated shared cool spaces or other common areas. There is no requirement for mechanical cooling in individual resident rooms.

SCORE **C**

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DESCRIPTIONS

The province/territory **has issued non-binding guidance or recommendations** encouraging mechanical cooling in resident rooms and designated shared cool spaces in long-term care facilities, developed through standard policy development and stakeholder consultation processes, such as consultation with long-term care operators and health authorities.

There are no legally binding requirements. Some long-term care homes have independently installed mechanical cooling, while others lack cooling.

SCORE **D**

The province/territory **has not issued any guidance or requirement**, binding or otherwise, for mechanical cooling in long-term care homes.

SCORE **E**



PT-4

To what extent does the province/territory mandate and support backup power for new and existing multi-unit residential buildings (MURBs) to protect residents during sustained, area-wide power outages?

DESCRIPTIONS

In addition to B, **provincial/territorial legislation addressing backup power for MURBs during sustained, area-wide power outages is comprehensive**.

It includes:

- regular verification through inspections or reporting, with priority inspections in buildings housing susceptible populations;
- enforcement mechanisms for non-compliance;
- capital funding opportunities; and
- integration into provincial/territorial emergency preparedness standards, particularly for buildings housing low-income, older, or medically vulnerable residents.

The province/territory also enables and supports municipalities to enforce these requirements and track compliance.

SCORE **A**

In addition to C, **the province/territory has established a legally binding requirement** for MURB owners to maintain backup power sufficient to sustain basic services, such as at least one elevator, common-area and stairwell lighting, and water access, for a defined minimum duration during an extended outage.

The legislation includes:

- a minimum backup duration sufficient to bridge a multi-day power outage; and
- provisions for both new and existing buildings.

Alternatively, the province/territory **permits municipalities to establish construction or design standards** that exceed provincial/territorial building code requirements for applications such as extended-outage backup power for MURBs. In this case, the municipality has established a standard or bylaw requiring MURB owners to implement extended-outage backup power.

Financial incentives, such as grants, tax relief, or financing, may also be provided, with priority given to high-risk or low-income buildings.

SCORE **B**

(continued on next page)

DESCRIPTIONS

The province/territory acknowledges the need for extended-outage backup power and has published voluntary guidelines or best practices and/or is developing legislation to support extended-outage backup power for MURBs.

In addition to D, **the municipality has developed** a property standards or licensing bylaw that requires MURB owners to maintain a vital service disruption plan or emergency response plan addressing tenant communication and service restoration during extended outages. This bylaw does not require the installation of backup power infrastructure and has been developed in consultation with relevant stakeholders.

SCORE **C**

At the provincial/territorial level, **there are no requirements or guidelines addressing backup power** for MURBs during sustained, area-wide power outages beyond existing short-duration emergency requirements.

The municipality recognizes that a lack of backup power in MURBs presents a challenge for residents and is exploring options for guidelines and educational materials on extended-outage backup power for MURB owners. The municipality may also be exploring a financial incentive program for MURB owners.

Guidelines and educational materials are developed in consultation with landlords, tenants, utilities, and other relevant stakeholders.

SCORE **D**

Neither the province/territory nor the municipality has requirements or guidance addressing backup power for MURBs during sustained, area-wide power outages.

SCORE **E**

Note: Existing building code backup power provisions are generally intended as life-safety measures for short-duration building emergencies, such as supporting evacuation and firefighting, rather than sustaining residents during multi-day, area-wide power outages.

Conclusion and Next Steps

5



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 is expected to 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.

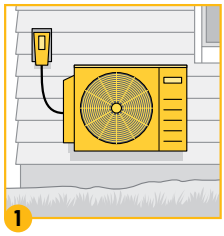
Ultimately, reducing extreme heat risk requires heat resilience to become a routine part of municipal decision-making, not an exceptional response during emergencies. The risks are real, but many deaths and illnesses are preventable when communities plan ahead, coordinate effectively, and invest in practical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



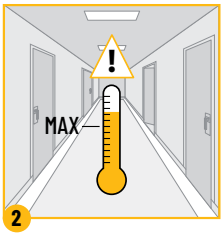
Three Levels of a Heat-Ready Community

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.

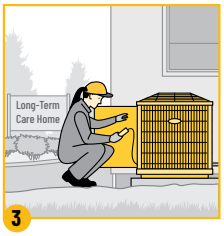
Level 1: Homes and Buildings



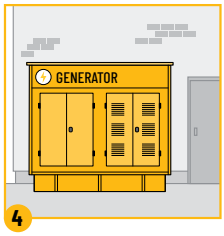
1 Support incentives and upgrades that keep indoor spaces safer during extreme heat, such as heat pumps and shade trees.



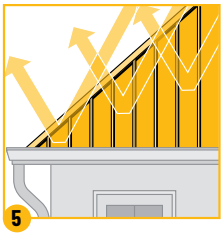
2 Cap maximum indoor temperature to protect residents from unsafe heat.



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

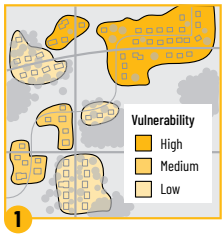


4 Plan for back-up power, with adequate fuel supply, during outages in multi-unit buildings and critical facilities.

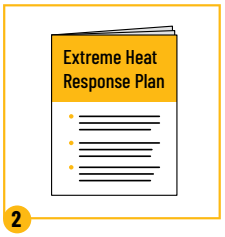


5 Install cool roofs, shading, and efficient cooling systems.

Level 2: Community-Based Heat Risk Management



1 Assess and map exposure and vulnerability to extreme heat.



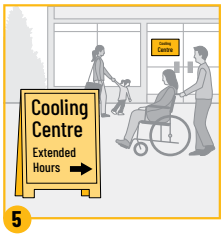
2 Develop, implement, and review an Extreme Heat Response Plan annually.



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

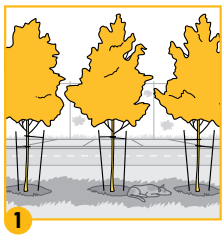


4 Coordinate heat check-ins with public health agencies and community organizations such as Red Cross, Meals on Wheels, Salvation Army.

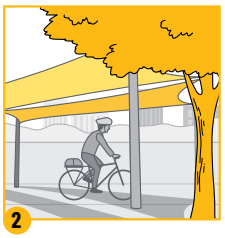


5 Open and promote cooling centres, pools, splash pads, libraries, and other cooling spaces.

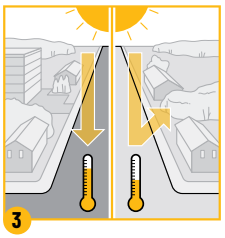
Level 3: Neighbourhood and Urban Cooling



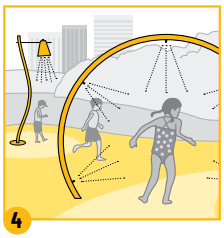
1 Grow and protect urban tree canopy, prioritizing heat-exposed neighbourhoods.



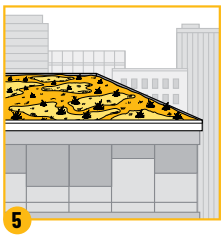
2 Build shaded walking, cycling, and transit routes.



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 and provided for educational purposes only, it does not constitute legal, engineering or other professional advice. 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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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, and 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 a lighter-coloured 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 individuals 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 comprises 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 to the, 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, populations susceptible to heat-related harm, (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 heat 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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