

Municipal Climate Change Adaptation Reference Collection

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There is a growing movement in response to climate change, known as climate change adaptation. In the general media, most attention has been focused on the need for climate change mitigation, which is action to reduce greenhouse gases that have caused climate change. Climate change adaptation is action to reduce the negative impacts of climate change.

Municipalities are now responding to the need to adapt to the long lasting change in weather patterns generated by climate change. For example, in July 2008, Toronto council unanimously adopted a climate change adaptation strategy for Toronto titled, “Ahead of the Storm.”¹

Figure 1, has been developed in the Toronto Environment Office to help explain the concepts of climate change mitigation and adaptation.

Given the alarming rates of climate change occurring, successful climate change mitigation is absolutely essential. Climate change adaptation is, unfortunately, going to be necessary, because it may take many decades for

the world to reach greenhouse gas reduction targets. In Toronto, key anticipated local impacts are expected to be increased probability of extreme weather such as heat, drought, rain, snow and ice storms, and winds.

Figure 2 was developed to provide examples of climate change mitigation and adaptation actions. Both types of actions are necessary, and some actions such as planting trees, buying local food and installing green roofs can help with both.

Reference Collection Available For Municipalities

The City of Toronto has assembled a considerable collection of reference materials on climate change adaptation, in partnership with the Institute for Catastrophic Loss Reduction (ICLR). The collection contains free, public access documents and resources posted by various organizations around the world. The collection is specifically and purposefully aimed at municipalities who are interested in developing a climate change adaptation strategy.

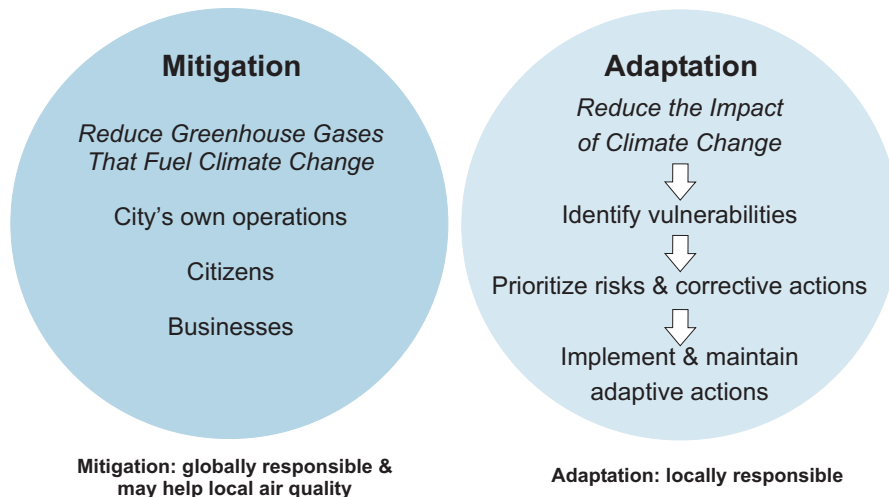
Work on the collection started 18 months ago, initially for use internally at the City of Toronto to support

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¹ <www.toronto.ca/teo/pdf/ahead_of_the_storm_highlights.pdf>.

Figure 1:
Towards a Resilient Toronto



the city's operating divisions in decision making. As the collection grew, it was realized that the collection would also be helpful to other municipalities. Anyone can run a Google search on a given topic; but, staff at the city have been assembling significant documents as they come across these in their daily work on the issue of climate change adaptation. The grouping of documents is meant to specifically help municipal level staff who want to get answers on particular types of issues relating to climate change impacts and adaptation.

The reference collection can be accessed through the Toronto Environment Office's website at <www.toronto.ca/teo/climate_change_adaptation/index.htm>.²

The Collection

The reference collection is organized under 12 headings, each of which addresses a particular aspect of climate change adaptation, and the headings are described below. Links to documents in the collection are provided where possible. If links are not available, a detailed citation is provided, which should allow one to track down a document easily. It is hoped that easier access to climate change adaptation documents through this online collection will help municipalities across Canada develop cli-

mate change adaptation strategies, incorporating climate change impacts and adaptation into their every day planning and decision making.

Impacts and adaptation overview – Much of the available public literature provides information on possible climate change impacts and adaptation strategy overviews. References in this section of the collection provide overviews of climate change impacts, and how climate change may affect several aspects of the environment and society. Both Canadian and international resources are included in this section, with topics including public risk perceptions, energy, infrastructure, insurance, and impacts and adaptations issues that are specifically relevant to local governments.

Comprehensive adaptation strategies – Comprehensive adaptation strategies address all aspects of climate change impacts that may affect a certain community, from impacts on water resources, to the health effects of increased urban heat-island impacts, to climate change impacts on hydro power distribution systems. Many comprehensive strategies have been developed by local governments. For example, King County in Washington State, US has developed a comprehensive strategy, which is considered one of the first of such documents in North America. Several

communities in Canada have begun to develop comprehensive strategies as well. This section includes links to comprehensive strategy documents, as well as supporting documents that were produced as part of comprehensive strategies.

Economic perspectives – Climate change will bring with it severe economic costs. In many cases, the economic impacts of climate change can be used as powerful drivers for climate change adaptation, as economic impacts of climate change can resonate with key decision makers. This section provides resources that explore the economic impacts of climate change for various public sectors (for example, water and public infrastructure), as well as resources and methods to help municipalities analyze the potential economic impacts of climate change in their own communities.

Risk management approaches – Risk management is an effective method by which municipalities can incorporate climate change impacts and adaptation into planning, policy, and decision making. Similar to established risk management structures, climate change adaptation requires investigation of climate change impacts at the local level, and then evaluation, implementation, and monitoring of adaptation methods. This section provides risk management overview documents, as well as comprehensive guides to help communities apply a risk management approach to climate change adaptation.

Multi-hazard disaster resilience – Climate change will have a substantial impact on the frequency and severity of climate and weather-related natural hazards across Canada. This section provides resources that can aid communities in the development and implementation of disaster mitigation plans. This section also provides methods that decision makers can apply to assess the economic ben-

² General information on the City of Toronto's work on climate change adaptation may be found at <www.toronto.ca/teo/adaptation.htm>.

efits of implementing mitigation measures, and resources that discuss the importance of altering emergency management approaches to reflect increasing severity and frequency of natural hazards caused by climate change.

Tools – This section of the reference collection provides resources that can help communities implement various components of an adaptation strategy. Many of these tools have been developed outside of the climate change adaptation field, but are nonetheless useful for adaptation strategy development. In this section, you will find tools for public engagement in climate change adaptation decision making, actions that homeowners can take to reduce their vulnerability to climate change impacts, and tools for integrating climate change adaptation into new development.

Planning – Effective climate change adaptation requires community planners to work with many departments within their municipality, including engineering, urban forestry and emergency management. Sustainable urban planning must include climate change impacts, including increased urban heat island effects, stormwater runoff, and natural hazard factors, and planners must ensure that new development is not vulnerable to climate change impacts. Documents in this section of the collection are intended to assist municipal planners in ensuring that their expertise and responsibilities are effectively integrated into municipal climate change adaptation strategies.

Sections for specific sectors, and Top 10 documents – The remaining sections of the collection include resources on climate change impacts for specific sectors, including impacts on transportation, water resources,

forestry, health, and business. A comprehensive list of websites of organizations and agencies working on climate change adaptation can also be found in the collection.

The collection also includes a list of “Top 10” documents, which are immediately helpful for municipal staff interested in climate change adaptation. The majority of the Top 10 documents were produced by or for Canadian communities, or were produced by Canadian researchers and practitioners and focus on Canadian adaptation issues. One “must read” paper that can get anyone thinking about climate change is “Adapting to Climate Change: An Introduction for Canadian Municipalities,” produced by the Canadian Climate Impacts and Adaptation Research Network. The paper gives a good high-level introduction to climate change impact issues for Canadian communities, and provides Canadian climate change adaptation case studies. Several other essential reads in this section will help anyone working on climate

change adaptation to get a good understanding of climate change adaptation approaches and issues.

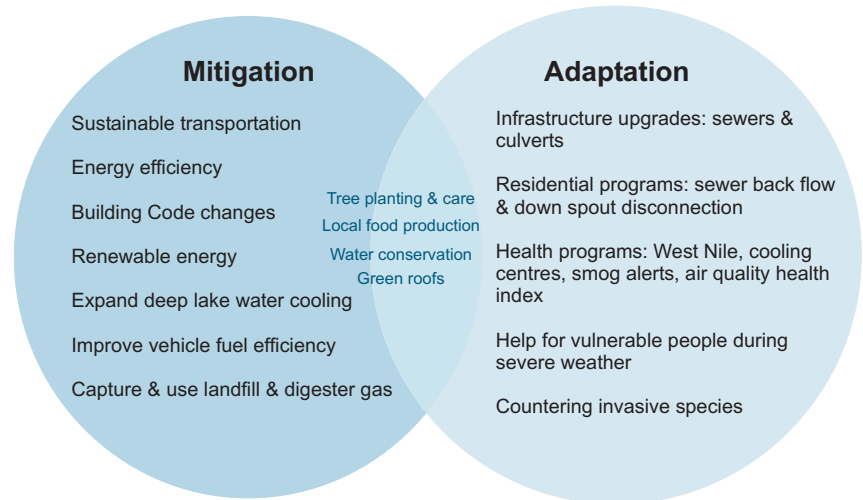
A Growing Collection

Clearly, all relevant public access documents are not currently included in this collection. Some areas, particularly forestry, planning, and transportation could benefit from more resources. Further, organizations from around Canada and the world are continuously producing new resources that can help municipalities in Canada adapt to climate change.

Our intention is for the Municipal Climate Change Reference Collection to include new materials as they are produced, as the more materials that are included in the reference collection, the more useful it will be to a wide range of municipal professionals.³ *MW*

³ If you know of a useful document or resource that should be in the collection, please contact the authors at <info@iclr.org> or <teo@

**Figure 2:
Examples of Action**



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