



## Guide 12 Climate Change Adaptation

Blue Dot

**Municipal Toolkit**  
Building a Low-Carbon Future





# Blue Dot Municipal Toolkit

People in Canada take pride in this country's natural landscapes, rich ecosystems and wildlife. But Canada's Constitution doesn't mention environmental rights and responsibilities. Municipalities across the country are recognizing and supporting their residents' right to a healthy environment. By adopting the Blue Dot declaration, more than 150 municipal governments now support the right to clean air and water, safe food, a stable climate and a say in decisions that affect our health and well-being.

For some municipalities, adopting the Blue Dot declaration is a clear statement about environmental initiatives already underway. For others, it's a significant first step. Either way, after passing a declaration, many ask "What happens next?"

This toolkit provides practical ideas for next steps. Its introduction and 13 downloadable guides cover topics related to human health, green communities and a low-carbon future. Written for policy-makers, each guide shares examples of policies and projects undertaken in communities in Canada and around the world. The goal is to inform, inspire and share good ideas and great practices that will lead to healthier, more sustainable communities now and in the future.

The following guides are available:

## **Introduction to the Blue Dot Municipal Toolkit**

### **Protecting Human Health**

- Guide 1: Air quality
- Guide 2: Clean water
- Guide 3: Non-toxic environment
- Guide 4: Healthy food

### **Creating Green Communities**

- Guide 5: Access to green space
- Guide 6: Protecting and restoring biodiversity
- Guide 7: Waste

### **Building a Low Carbon-Future**

- Guide 8: Transitioning to 100% renewable energy
- Guide 9: Green buildings
- Guide 10: Sustainable transportation
- Guide 11: Green economy
- Guide 12: Climate change adaptation
- Guide 13: Ecological footprint and land-use planning

To read more about municipal actions for environmental rights, and to access all the Blue Dot toolkit guides, visit <http://bluedot.ca/municipal-toolkits/>. To read more about the Blue Dot movement and work at the local, provincial and federal levels, visit [www.bluedot.ca](http://www.bluedot.ca).

Ensuring a healthy environment requires action in communities of all sizes and at all levels of government. This toolkit helps municipalities continue to take the lead.

## Acknowledgments

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# Building a Low-Carbon Future

## Guide 12: Climate Change Adaptation

All communities in Canada have a responsibility to combat climate change by reducing greenhouse gas emissions. We're already experiencing the effects of climate change: higher temperatures, changes in precipitation patterns and extreme weather events. So municipalities should also plan for and adapt to predicted climate change impacts. Adaptation measures will vary depending on geography, predicted climate change and existing infrastructure. Following are some examples of municipalities with different adaptation challenges and tools.

### Canadian examples of good practices

#### a. Toronto

- i. **Initiatives:** In 2014, city council passed a requirement that all city agencies adopt a climate change risk management policy, or similar policy, and required annual reporting by 2016. It also requested that provincial and federal governments prioritize the health and safety of residents in a changing climate.

Toronto's climate change adaptation efforts focus on health impacts during higher frequency and more extreme heat waves. It integrated its Heat Health Alert System into a Hot Weather Response Plan. This includes public communication about extreme heat risks and precautions, notifying community agencies, drop-in cooling centres, providing transportation tokens to cooling centres for the homeless, a Red Cross information line and bottled water distribution.<sup>1</sup> Toronto's Climate Change and Health Strategy 2015 also includes health measures for adapting to climate impacts on air quality and vector-borne diseases.<sup>2</sup> The city has developed heat vulnerability maps to help community agencies plan response.<sup>3</sup> Other initiatives include greening parking lots, a green roof bylaw and using lake water cooling systems to reduce peak electricity demand on extremely hot days.<sup>4</sup>

#### b. Halifax:

- i. **Initiative:** Halifax was one of the first Canadian cities to initiate a detailed climate adaptation risk study. It developed a Climate Change Risk Management Strategy and launched the Climate SMART program.<sup>5</sup> Halifax's prioritized risk is increased extreme weather combined with sea level rise. The city conducted a study of historical and projected sea levels in partnership with institutional and commercial harbour stakeholders. This resulted in an interim measure that future development should be at least 2.5 metres above

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1 Natural Resources Canada, *Adapting to Climate Change*, 2010, [https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/mun/pdf/mun\\_e.pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/mun/pdf/mun_e.pdf).

2 Toronto Public Health, *A Climate of Concern: Climate Change and Health Strategy for Toronto*, 2015, <http://www.toronto.ca/legdocs/mmis/2015/hl/bgrd/backgroundfile-81509.pdf>.

3 City of Toronto, "Information for Community Partners," 2015, <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=bd4b5ce6dfb31410VgnVCM10000071d60f89RCRD&vgnextchannel=faf1ebfc2bb31410VgnVCM10000071d60f89RCRD>.

4 City of Toronto, *Toronto's Adaptation Actions*, 2011, [http://www1.toronto.ca/City Of Toronto/Environment and Energy/Our Goals/Files/pdf/toronto\\_cc\\_adapt\\_actions.pdf](http://www1.toronto.ca/City Of Toronto/Environment and Energy/Our Goals/Files/pdf/toronto_cc_adapt_actions.pdf).

5 ICLEI-Local Governments for Sustainability and Federation of Canadian Municipalities, *Municipal Resources for Adapting to Climate Change*, 2009, [https://www.fcm.ca/Documents/reports/PCP/Municipal\\_Resources\\_for\\_Adapting\\_to\\_Climate\\_Change\\_EN.pdf](https://www.fcm.ca/Documents/reports/PCP/Municipal_Resources_for_Adapting_to_Climate_Change_EN.pdf).



the high water mark.<sup>6</sup> The strategy also recommended incorporating climate change into risk management programs, updating design criteria and enhancing community outreach to prepare the public for climate adaptation.

- ii. **Results:** The city's 2014 Regional Municipal Planning Strategy and supporting bylaws and development plans prohibit residential development within 3.8 metres of sea level.<sup>7</sup>

#### c. Clyde River climate change adaptation plan

- i. **Initiative:** Clyde River held public workshops in 2006 to develop its climate change adaptation plan. It was the first of its kind in the Canadian Arctic and led to the Nunavut Climate Adaptation Group. The plan was created through a partnership with a number of agencies and groups.
- ii. **Results:** The process resulted in concrete action plans for dealing with melting permafrost (e.g., reinforcing electrical poles), rising sea levels (amending a zoning bylaw to restrict development in areas expected to be covered with sea level rise), and self-rescue training and tools for people going on thin ice.<sup>8</sup>

#### d. Prince George

- i. **Initiatives:** The city partnered with the University of Northern British Columbia and other organizations to assess climate change impacts. Its climate adaptation strategy highlights forests and floods. It embedded climate change adaptation in the Official Community Plan and throughout other OCP sections, requiring it to be considered, for example, in stormwater management policies and slope stability hazards.<sup>9</sup>
- ii. **Results:** This plan has already resulted in fire management in forests affected by mountain pine beetle infestation and increased species diversity in planting trees. The city also increased the freeboard allowance (the vertical distance above the flood plain where development would not be permitted).<sup>10</sup>

#### e. Surrey

- i. **Initiatives:** Surrey's Climate Adaptation Strategy includes commitments to improve community resiliency by protecting ecosystem services and examining climate impacts to both artificial and natural infrastructure. It looks at six departments: flood management and drainage, infrastructure, natural areas and ecosystems, urban trees and landscaping,

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6 Natural Resources Canada, *Adapting to Climate Change*.

7 Based on the Canadian Geodetic Vertical Datum of 1928 (CGVD28). Halifax Regional Municipality, *Regional Municipal Planning Strategy*, <https://www.halifax.ca/regionalplanning/documents/RegionalMunicipalPlanningStrategy.pdf>

8 Hamlet of Clyde River and Ittaq Heritage and Research Centre, *Climate Change Adaptation Action Plan, 2006*, [https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/mun/pdf/mun\\_e.pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/mun/pdf/mun_e.pdf).

9 ICLEI-Local Governments for Sustainability, *Finding the Nexus: Exploring Climate Change Adaptation and Planning, 2014*, [http://icleicanada.org/images/icleicanada/Adaptation\\_Planning\\_Nexus\\_Final.pdf](http://icleicanada.org/images/icleicanada/Adaptation_Planning_Nexus_Final.pdf).

10 City of Prince George, "Climate Change Adaptation," <https://princegeorge.ca/environment/climatechange/adaptation/pages/default.aspx>



agriculture and food security, and human health and safety. It was developed with staff from multiple divisions; each department prioritized actions, helped select indicators and identified interdepartmental options. The plan integrated biodiversity by prioritizing ecosystem service management.<sup>11</sup> The city identified 11 priority actions including reviewing policies and bylaws to support resiliency, integrating climate change education and awareness into existing programs, constructing timelines for specific expected climate impacts and implementing the Biodiversity Conservation Strategy.<sup>12</sup>

- ii. **Results:** As of 2014, Surrey participated in a regional flood management strategy and partnered with the non-profit Evergreen to conduct a neighbourhood resilience workshop.<sup>13</sup>

## International examples of good practices

### f. New York City

- i. **Initiatives:** New York City consulted with the public in workshops and community group meetings to develop its climate change adaptation plan six months after Hurricane Sandy. As of 2015, the plan has inspired the investment of \$100 million in shoreline protection in vulnerable communities, six million square feet of cool roofs and 16 new local laws to improve resiliency through updating building and zoning codes for flood preparedness, armored levee investment and small business resiliency support.<sup>14</sup>
- ii. **Results:** In 2013, New York won the Climate Resiliency and Adaptation award from the C40 Cities Climate Leadership Group for its storm surge preparation.<sup>15</sup>

### g. Seattle

- i. **Initiatives:** Seattle has developed a strong climate action implementation strategy with cost details and needed resources.<sup>16</sup> In 2015, the city piloted a Sea Level Rise Planning Guidance for Capital Projects and developed a Climate Preparedness Strategy. In 2013 and 2014, it improved flood plains and culverts to reduce flooding risk.<sup>17</sup> A regional vulnerability survey showed an increased landslide risk from precipitation, so Seattle developed a strategy to restore vegetation to landslide-prone areas.<sup>18</sup>

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11 ICLEI-Local Governments for Sustainability and Toronto and Region Conservation Authority, *biodiverCITIES: A Primer on Nature in Cities*, <http://icleicanada.org/component/k2/item/121-biodivercitiesprimer>.

12 City of Surrey, "Climate Adaptation Strategy," 2013, <http://www.surrey.ca/community/14146.aspx>.

13 City of Surrey, *Sustainability Charter: 2014 Annual Report*, 2014, [http://www.surrey.ca/files/2014\\_Sustainability\\_Charter\\_Annual\\_Report\\_FINAL.pdf](http://www.surrey.ca/files/2014_Sustainability_Charter_Annual_Report_FINAL.pdf).

14 City of New York, "Mayor de Blasio Releases NPCC 2015 Report, Providing Climate Projections Through 2100 for the First Time," February 17, 2015, <http://www1.nyc.gov/office-of-the-mayor/news/122-15/mayor-de-blasio-releases-npcc-2015-report-providing-climate-projections-2100-the-first>.

15 C40 Cities, "New York City: A Stronger, More Resilient New York," <https://www.nycedc.com/resource/stronger-more-resilient-new-york>.

16 City of Seattle, *Seattle Climate Action Plan: Implementation Strategy*, 2013, <http://www.seattle.gov/Documents/Departments/OSE/FinalCAPImplementationStrategy.pdf>.

17 City of Seattle, *Seattle Climate Action Plan: Implementation Strategy Progress Report*, 2015, <http://www.seattle.gov/Documents/Departments/OSE/CAPDetailedStatusReportFeb2015.pdf>.

18 ICLEI-Local Governments for Sustainability, *Finding the Nexus: Exploring Climate Change Adaptation and Biodiversity*, 2012, [http://www.icleicanada.org/images/icleicanada/pdfs/Nexus\\_Series\\_Adaptation\\_Biodiversity\\_Final\\_sm.pdf](http://www.icleicanada.org/images/icleicanada/pdfs/Nexus_Series_Adaptation_Biodiversity_Final_sm.pdf).



#### h. Melbourne

- i. **Initiatives:** In 2010, Melbourne created a multi-million dollar Urban Landscapes Adaptation Program to help take immediate action on heat and drought. The program's goals are to reduce drought vulnerability, cool the city by 4°C, increase green space to 7.6 per cent of municipal space and double the urban forest. Actions include expanding green space, developing biodiversity planting guidelines, replacing impermeable surfaces with permeable pavement and developing green roofs.
- ii. **Results:** Melbourne's adaptation program won the 2014 Climate Resiliency and Adaptation award from the C40 Cities Climate Leadership Group.<sup>19</sup>

#### i. New Orleans water plan

- i. **Initiative:** New Orleans has created a water management plan that focuses on slowing, storing, and using water rather than pumping it away. Its plans include permeable pavement, rain gardens, and large infrastructure upgrades such as canal development. In addition to reducing flood and erosion risks, the development of waterways and larger green spaces is also expected to create microclimates that will reduce the heat island effect.<sup>20</sup> The plan also includes the adoption of a 500-year flood protection level.<sup>21</sup>

### Good practices documents and links

- o [Adapting to Climate Change: An Introduction for Canadian Municipalities](#) — Natural Resources Canada, 2010
- o [Adaptation Resources from the Federation of Canadian Municipalities](#)
- o [Building Adaptive and Resilient Communities \(BARC\) Resources](#)
- o [Preparing for Climate Change](#) — West Coast Environmental Law's checklist for municipal governments with a focus on British Columbia

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19 C40 Cities, "Melbourne: Urban Landscapes Climate Adaptation Program," 2014, <http://www.c40.org/profiles/2014-melbourne>.

20 C40 Cities, "New Orleans: Greater New Orleans Urban Water Plan," 2014, <http://www.c40.org/profiles/2014-neworleans>.

21 Waggoner & Ball Architects, Greater New Orleans Urban Water Plan: Implementation (New Orleans, 2013), [https://www.dropbox.com/s/u3938pl4vhd9ywi/GNO Urban Water Plan\\_Implementation\\_03Oct2013.pdf](https://www.dropbox.com/s/u3938pl4vhd9ywi/GNO%20Urban%20Water%20Plan_Implementation_03Oct2013.pdf).



## Advisory services

The **Natural Step Canada (TNSC)** is a national charity whose mission is to tackle climate change and accelerate the transition to a truly sustainable society that thrives within nature's limits. Its academy, advisory services and Sustainability Transition Labs use best-in-class science, systems thinking and facilitation to help individuals and organizations collaborate, solve complex problems, foster innovation, optimize performance and drive systems change.

TNS Canada offers a **Service Cycle for Sustainable Communities** to help municipal governments plan for long-term sustainability and resiliency, embed sustainability into their culture and operations, and engage community stakeholders in their sustainability plans.

To learn more go to: <http://naturalstep.ca/>

The **Whistler Centre for Sustainability (WCS)** is a non-profit organization with the mission to "inspire and facilitate effective planning and meaningful conversations for a better world." WCS provides innovative community engagement, planning and implementation services to local governments across Canada, drawing on its expertise and experience in more than 40 communities. The Centre's work is rooted in future-focused social, environmental and economic values, so that final deliverables embed sustainability throughout.

To learn more go to: <http://whistlercentre.ca>