



Guide 2 Clean water



Blue Dot

Municipal Toolkit
Protecting Human Health

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.

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.

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Protecting Human Health

Guide 2: Clean water

Access to clean water is an essential component of the right to a healthy environment. The Conference Board of Canada ranked Canada 15th out of 16 comparable countries for its high water consumption, thought to be due to a lack of both water conservation incentives and volume-based water pricing.¹ Municipalities can help to change this by managing water supply and quality using practices that consider future generations. Water management policies in this section include water conservation, pricing and quality initiatives.

Canadian examples of good practices

a. Okotoks: Water management plan

- i. **Initiative:** Okotoks uses a water pricing system. It meters water and sewage for the whole community. Prices are based 80 per cent on the consumer's consumption rate and 20 per cent on a flat rate, with a utility rebate for purchasing water conservation products (e.g., rain barrels, low-flush toilets). The consumption rate is an increasing block rate — the rate per cubic metre of water increases as total water consumption increases. Stormwater rates are a flat fee. The city has an extensive leak detection and water main upgrade program. Conservation strategies also include using reclaimed water for boulevard trees and planting beds, automatic summer water restrictions, efficiency standards for renovations needing plumbing permits, and minimum topsoil depths for water retention in new residential properties.² The city also has a tertiary wastewater treatment plant that composts the sludge of bio-solids into Grade A commercial compost and removes biological nutrients.³
- ii. **Results:** The city reduced gross water consumption by 41 per cent between 2002 and 2011. In 2013, it achieved a community water consumption rate of 273 litres per person per day and a residential consumption rate of 177 litres per person per day — one of the lowest per capita consumption rates in North America. It has a leak rate of only 3.8 per cent. The Okotoks Water Management Plan won the Federation of Canadian Municipalities 2015 Sustainable Communities Award in the water category.⁵

b. Sechelt: Wastewater project

- i. **Initiative:** The Sechelt Water Resource Centre is designed to achieve LEED Gold accreditation and provide energy efficient wastewater treatment. The project was joint-funded by federal and provincial governments, the FCM Green Municipal Fund, Sechelt Indian Government District, and the District of Sechelt. The facility uses a system of plants

1 Conference Board of Canada, "Water Withdrawals," How Canada Performs, 2013, <http://www.conferenceboard.ca/hcp/details/environment/water-consumption.aspx>.

2 Town of Okotoks, Water Conservation, Efficiency, and Productivity Plan.

3 Town of Okotoks, "Sanitary Sewage System," 2015, <http://www.okotoks.ca/town-services/public-works/water-sewer/sanitary-sewage-system>.

4 Town of Okotoks, Water Conservation, Efficiency, and Productivity Plan.

5 Federation of Canadian Municipalities, "2015 Water Program: Town of Okotoks, Alberta," 2015, <http://www.fcm.ca/home/awards/fcm-sustainable-communities-awards/2015-winners/2015-water-program.htm>.



in a greenhouse to help treat waste products.⁶ The effluent produced from the project can be used for landscape, industrial, and agricultural purposes including the irrigation of food crops. Bio-solids are composted into a Class A fertilizer product, which has unrestricted use. In 2015, the facility started field tests to study a new way of removing hormones, pharmaceuticals, and other endocrine-disrupting compounds from the treated wastewater effluent using a biochar program.⁷

- ii. **Results:** The project is one of the best performing advanced wastewater treatment systems in Canada.⁸

c. Calgary: Water management plan

- i. **Initiative:** Calgary's "30 in 30" policy aims to reduce per capita water consumption by 30 per cent over 30 years. In 1991, Calgary introduced a Water Meter Incentive Program that offered rebates if customers paid more on a meter than they would have on a flat rate. Since then, the city has switched to using water metering as the default option for homeowners and uses monthly water bills to cover the cost of water management programs.⁹ The city also upgraded three water parks to reuse water with small-scale treatment systems, offered a toilet rebate that replaced nearly 100,000 toilets from 2003 to 2016¹⁰, and had a water main leak detection program and proactive water main replacements. The city upgraded its wastewater treatment plants to reduce water withdrawn up to 100 megalitres per day and uses wastewater treatment by-products to heat and power the wastewater plant.
- ii. **Results:** The city reduced water use from 212,500 megalitres in 2003 to 174,433 megalitres in 2016 and achieved a residential water consumption rate of 214 litres per person per day in 2016.¹¹ The city ranked first out of 27 large North America cities for water management in the 2010 Green City Index ranking.¹²

d. Whistler: Wastewater management

- i. **Initiative:** Whistler has a state-of-the-art tertiary wastewater treatment plant with nutrient removal and ultraviolet disinfection. The treatment plant transfers heat from wastewater

6 Town of Okotoks, "Sanitary Sewage System," 2015, <http://www.okotoks.ca/town-services/public-works/water-sewer/sanitary-sewage-system>.

7 Town of Okotoks, Water Conservation, Efficiency, and Productivity Plan.

8 Federation of Canadian Municipalities, "2015 Water Program: Town of Okotoks, Alberta," 2015, <http://www.fcm.ca/home/awards/fcm-sustainable-communities-awards/2015-winners/2015-water-program.htm>.

9 District of Sechelt, "Sechelt Water Resource Centre," 2015, <http://www.fcm.ca/home/programs/green-municipal-fund/gmf-news/2015/government-of-canada-and-fcm-help-sechelt-reclaim-wastewater.htm>.

10 Federation of Canadian Municipalities, "Government of Canada and FCM Support Sechelt's Effort to Remove Hormones and Pharmaceuticals from Reclaimed Water," GMF News, January 30, 2015, <http://www.fcm.ca/home/programs/green-municipal-fund/gmf-news/2015/government-of-canada-and-fcm-help-sechelt-reclaim-wastewater.htm>.

11 Federation of Canadian Municipalities, "Government of Canada and FCM Support Sechelt's Leading-Edge Water Resource Centre," GMF News, October 16, 2014, <http://www.fcm.ca/home/programs/green-municipal-fund/gmf-news/2014/government-of-canada-and-fcm-support-sechelt-leading-edge-water-resource-centre.htm>.

12 City of Calgary, Water Efficiency Plan 30-in-30, by 2033, http://www.calgary.ca/UEP/Water/Documents/Water-Documents/water_efficiency_plan.pdf



to the District Energy System in the Cheakamus Crossing neighbourhood. Water discharged from the plant meets recreational water receiving requirements.¹³

e. **Halifax: Water consumption and leak detection**

- i. **Initiatives:** Halifax has a full user pay system. People are charged for water and wastewater based on meters and for stormwater based on impermeable surface area¹⁴. It also uses a pressure management system to reduce leakages and has created a system that can determine where leaks are located.
- ii. **Results:** In 2014, Halifax achieved a total water consumption rate of 291 litres per person per day. Its leak detection program, which has reduced leakage by 40 megalitres per day since 1999, won the 2014 Canadian Society of Civil Engineering award.¹⁵

International examples of good practices

f. **Copenhagen**

- i. **Background:** Under Danish law, all properties must have water meters.
- ii. **Initiatives:** Copenhagen's goal is to reduce residential water consumption to 100 litres per person per day by 2017.¹⁶ As of February 2017, they are close to reaching this goal having reduced water consumption to 104 litres per person per day.¹⁷ The city requires water supply companies to allocate funds to establish suite-level metering for apartment buildings. Copenhagen uses electronic leak detection equipment. It also notifies people who excessively consume water in their water bills.¹⁸
- iii. **Results:** Meter pricing and awareness campaigns are thought to be key factors in why Copenhagen's water consumption fell from 170 litres per person per day in 1987 to 108 litres per person per day in 2010.¹⁹

¹³ Resort Municipality of Whistler, "Wastewater Treatment Plant," accessed August 1, 2015, <https://www.whistler.ca/services/water-and-wastewater/wastewater-treatment-plant>.

¹⁴ Halifax Water, "Water, Wastewater/Stormwater Rates & Fees," 2015, n.d., <http://www.halifax.ca/halifaxwater/ratescharges/index.php>.

¹⁵ Halifax Water, 2014/2015 Annual Report, 2015, http://www.halifax.ca/halifaxwater/documents/Annual_Report_2014-2015.pdf.

¹⁶ City of Copenhagen, Copenhagen Application: 2014 Green Capital City, 2012, http://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2012/07/Section-8-Water-Consumption_Copenhagen.pdf.

¹⁷ Stavenhagen M. Buurman J. and Tortajada C. (2017, February 23) The Straits Times. <http://www.straitstimes.com/opinion/how-to-use-less-water-to-have-more-look-to-europe>

¹⁸ European Green Capital, Urban Sustainability - Learning from the Best, 2013, http://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2013/02/egc_bpcatalogue_2010-2011.pdf.

¹⁹ European Green Capital, Expert Evaluation Panel-Synopsis Technical Assessment Report, 2012, <http://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2011/04/MDR0763Rp00011a-Synopsis-Technical-Assessment-Report.pdf>.



g. Stockholm: Wastewater treatment

- i. **Initiatives:** Stockholm's Henriksdal Wastewater Treatment Plant uses mechanical, chemical, biological and sand filtration processes to treat wastewater before releasing it into the ocean. It collects biogas produced through anaerobic digestion during wastewater treatment. Pre-treatment is required for businesses such as car washes and dentists, so sludge is of high enough quality for use as agricultural fertilizer. Sludge is also used for land restoration. Heat extracted from treated wastewater is used in Stockholm's district heating system. The city cleaned up its watershed and prevents pollutants from entering the system to achieve its policy that all water must have satisfactory quality for swimming.²⁰
- ii. **Results:** At least 98 per cent of phosphates and 50 per cent of nitrogen are removed during wastewater treatment. Biogas produced at the wastewater treatment plant is used to power city buses, taxis and private cars. This is estimated to avoid 22,000 tonnes of carbon dioxide emissions annually.²¹

h. Other interesting ideas

- i. St. Petersburg, Florida installed the first water reclamation system in the U.S. — one of the largest in the world. The treatment process retains nitrogen and phosphorous for use as fertilizers. The system delivers water for lawn and ornamental garden irrigation. Reclaimed water users have fewer watering restrictions and lowered water rates.²²

Good Practices Documents and Links

- o [POLIS Water Project Top 10](#) — a list of ideas for managing municipal water sustainability.
- o [Green Infrastructure Guidelines](#) — West Coast Environmental Law success stories and best practices for green infrastructure.
- o [Municipal Best Management Practices: Water Quality](#) — a B.C. government publication.
- o [Resources from Waste: A Guide to Integrated Resource Recovery](#) — a B.C. government publication.

²⁰ Stockholm Vatten, "Water and Wastewater," accessed April 19, 2017, <http://www.stockholmvattenochavfall.se/en/water-and-wastewater/>.

²¹ Stockholm Vatten, "Water and Wastewater."

²² City of St. Petersburg, "Reclaimed Water," accessed August 1, 2015, http://www.stpete.org/water/reclaimed_water.php.



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>