

## Thirsty City is a series of walks exploring Toronto's historic and current water issues.

Discover the secret life of water in the city! You will learn about the remarkable water system that brings clean water to our taps, and the sewer system that takes polluted water – both sewage and stormwater – away. You will also rediscover ancient aquifers, springs and the network of creeks that once supported life here, and are now buried under the surface.

For more information about Thirsty City and more walks like this one visit [www.thirstycitywalks.ca](http://www.thirstycitywalks.ca)



RiverSides is a Toronto-based non-profit organization dedicated to helping communities protect and restore urban watersheds through stormwater pollution prevention.

[www.riversides.org](http://www.riversides.org)



Lost Rivers is a project of the Toronto Green Community to encourage understanding of the city as a part of nature rather than apart from it, and to appreciate and cherish our heritage.

[www.lostrivers.ca](http://www.lostrivers.ca)

# Thirsty City

A series of walks exploring the secret life of water in Toronto.

## Water and Energy

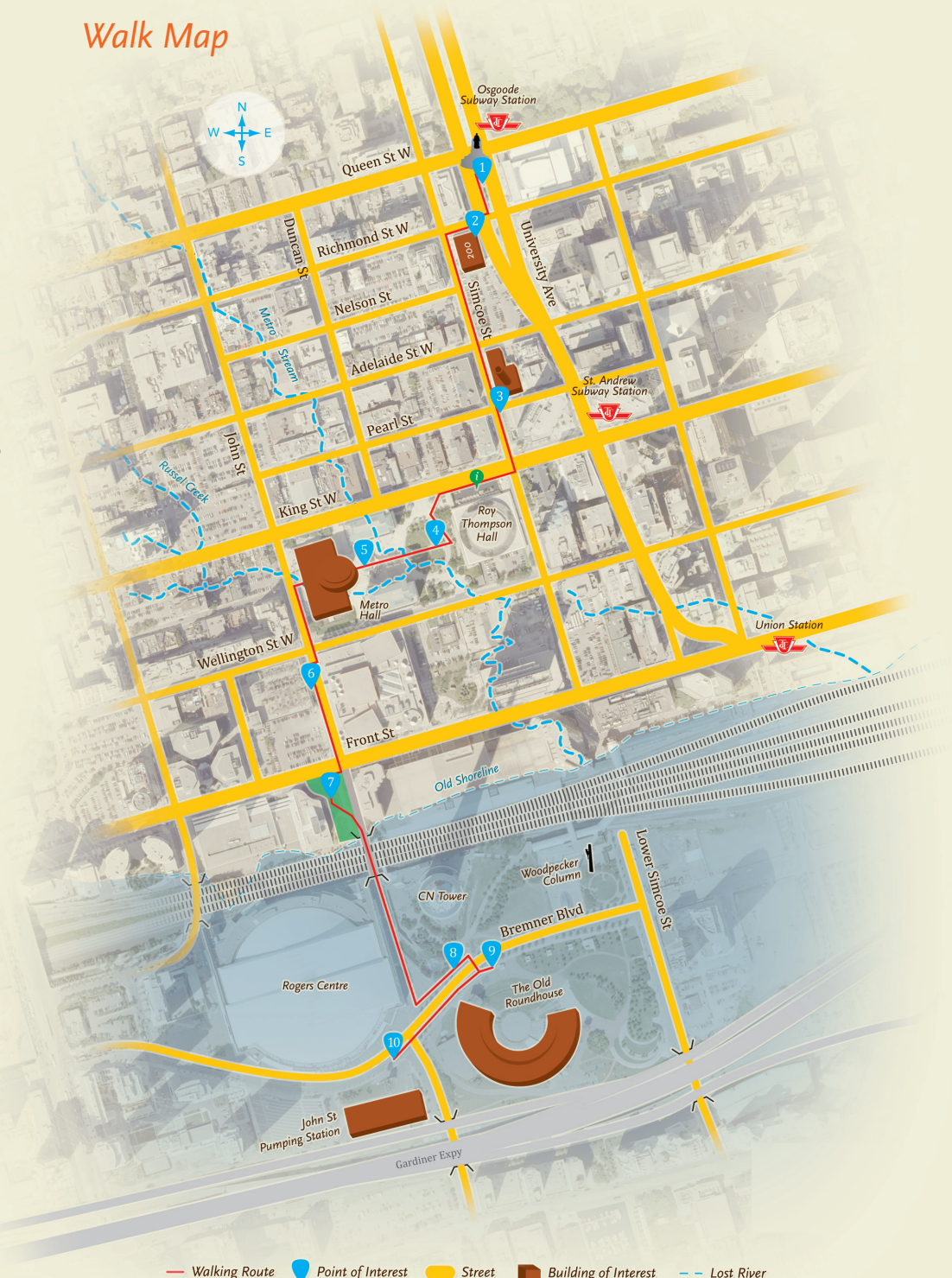
Exploring the connection in Toronto's landscape

This walk starts at Queen St and University Ave, and will take approximately 90 minutes to complete.

Support for this self-guided tour has been generously provided by



### Walk Map



In cities we use water to generate energy, and we use energy to distribute water; this is a fundamental characteristic of our urban ecosystem. Water is used both to refine fossil fuels and, as steam, to turn the turbines in coal, natural gas and nuclear power plants. These plants also pollute water with toxic residues and excess heat. Additionally, moving water turns the turbines in hydroelectric power plants, while hydro dams alter and threaten aquatic habitats.

At the same time, the water system uses vast amounts of energy, producing megatonnes of greenhouse gases every year. In Toronto one third of all the electricity used by the City is needed to purify, distribute and treat water and wastewater.

On this walk we will encounter images of the past when this area was "a large open space, much broken up by a rivulet – Russell's Creek – that meandered most recklessly through it" (Henry Scadding, 1873).

At that time, Toronto's drinking water came from creeks, springs and wells; wind moved ships in the harbour, wind and water powered mills, and a major source of energy was horses, oxen and human muscle power.

We will see how dramatic changes transformed Ontario into Canada's industrial "powerhouse". And we will see how these changes created challenges – but also opportunities – to creating a more sustainable city in our era of water crises, global warming and ecological shocks.

### Glossary

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- Hydroelectricity** - Electricity that is generated by the force of falling water turning a turbine.
- Run-of-the-river hydro power** - Power production through turbines that requires only the natural slope of the river, not a dam and spillway, to generate energy.
- Cogeneration** - The use of steam to both heat space and power a generator; thus conserving both water and energy.
- Stormwater** - Rainwater after it hits the ground surface.
- Combined sewer** - A sewer pipe that carries both stormwater and sanitary waste to the sewage treatment plant.
- Lost River** - A river or creek buried underground and/or turned into sewers.
- Green Roof** - A roof consisting of a vegetated area that reduces both stormwater run-off and heat absorption.
- Renewable** - Able to be replaced by natural processes at a rate comparable or faster than its rate of consumption.
- Fossil Fuels** - Coal, oil and natural gas, non-renewable fuels that formed from plants and animals that lived millions of years ago.

## 1 Adam Beck Statue Queen & University, central median, South side

In the early years of the 20th century, Adam Beck built the world's first public electricity agency. His vision, to use the mighty power of Niagara Falls for generating electricity, laid the foundation for the transformation of Ontario into the industrial powerhouse of Canada. Today, about a quarter of Ontario's power is considered to be "renewable", most of it from hydroelectric sources. Massive hydro dams create their own environmental problems, but the two "run-of-the-river" power stations at Niagara are still models of green power a century after Beck envisioned them.



Adam Beck Statue

2009, Georgia Vidras

*i* Read the text engraved on the side of the statue.

*i* Continue south on the median to Richmond St. and cross to the West side of University Ave.

## 2 200 University Ave SW corner of Richmond and University

There are several "green building" rating systems which measure the design and construction of new buildings, including the voluntary Leadership in Energy and Environmental Design (LEED), and the mandatory City of Toronto's Green Development Standard for buildings. While these rating systems offer high marks for innovative new practices, they have been criticized for granting certification for unimaginative approaches to green design.

## 3 Enwave Pearl Street Steam Plant NE corner of Simcoe and Pearl

This building was Toronto Hydro's first "district heating" plant when it opened in 1964, and is now part of the largest system in Canada. Operated by Enwave, this plant generates heat in natural gas boilers and distributes steam through a pipe network to downtown buildings providing energy efficiencies in heating. This plant will be retrofitted with a system to return condensed steam to the plant for reuse, increasing its water efficiency. Cogeneration is an even more efficient use of steam that uses steam to heat space, and also to generate electricity.

*i* On the south side of King St., look down to see the below-grade water feature at Roy Thompson Hall. The feature suggests a pristine boreal lake.

## 4 Lost Rivers in a Landscape

Russell Creek once flowed nearby, and was joined by a small tributary here in Metro Square. Today the creek is piped to the wastewater treatment plant along with sewage and rain; in major storm events, this combined sewer overflows and enters Lake Ontario between Spadina and Bathurst streets.



Water Fountain at Metro Square

2009, Georgia Vidras

While Russell Creek is piped away, lake water is treated to drinking standards and pumped back into the City for all urban uses. Approximately 8-10 percent of municipal water is used for drinking and cooking, but here, as elsewhere in the City, we can see fountains flowing, gardens watered and toilets flushed with drinking water. Using alternate sources of water such as rainwater or recycled water for non-drinking needs could dramatically reduce potable water use, water and wastewater treatment costs, energy use and greenhouse gas production.

*i* Cross west through the square to the central doors of Metro Hall.

## 5 Metro Hall

This building was the pilot site for Enwave's Deep Lake Water Cooling system, now the largest such system in the world. Naturally chilled water circulates in a closed-loop network of pipes through a number of downtown buildings. This provides an energy-efficient cooling system. Compared to conventional air conditioning, Enwave estimates this cooling system saves 90% of the electricity (enough to power 6,800 homes), eliminates 79,000 tonnes of carbon dioxide and cuts 45,000 kg of CFC refrigerants.

Metro Hall has also received a BOMA Award. (See Stop 2) Other 'green' features of Metro Hall include passive heating/cooling, a green roof, low-flow water appliances and motion-activated lighting.

*i* Enter Metro Hall, choose either path through the building to exit on the far side at John Street.

## 6 John Street Transformer Station (TS)

The John St. TS distributes power to the downtown through underground transmission lines. This station was first linked to the electricity grid from the west, and in 2008, it was linked to another TS in the east - via a new tunnel running below Front St. - to guard against black-outs if one part of the grid fails. "Peak" periods of electricity use and water use frequently coincide in hot summer months due to air conditioning and water use for cooling and irrigation. The result may be black- or brown-outs.

Energy distributed here includes hydro power from Niagara Falls and coal power coming from the west. The new link to the east carries nuclear power from Pickering and Darlington and hydro power from the Ottawa and other rivers.

## 7 Isabella Valancy Crawford Park

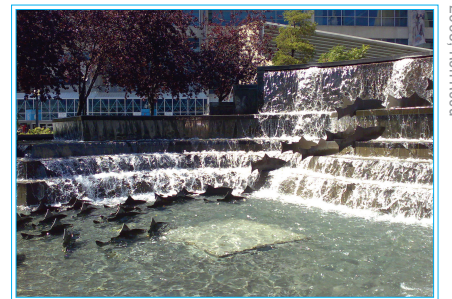
*i* This small park is on the south side of Front St. Note the park plaque on your right.

This park acts as a 'green roof' over a parking garage beneath your feet. Note the temperature and air quality difference in this pocket of green. Vegetation provides shade and moisture to the air combating the heat radiating from concrete in the summer, and also helps rainwater soak into the ground. Green roofs have similar effects on buildings; they insulate against heat and cold, reducing energy use year-round, and they also absorb large amounts of stormwater.

*i* Take the stairs to the pedestrian walkway over the railway tracks. Keep to the right on the path and take the stairs down past the Rogers Centre. Turn left at the bottom of the stairs.

## 8 Salmon Run Fountain at the CN Tower

The Salmon Run fountain by Susan Schelle was "... created to acknowledge the natural heritage of the Toronto lakeshore and inspire hope for the ecological well-being of an area now dominated by human traffic." (David Liss) It also reminds us about the negative impact of hydro dams on wildlife. Dams create a physical obstacle for salmon travelling up the river to the spawning grounds. They also alter the river ecosystem by large scale upstream flooding and reservoir creation.



"Salmon Run" Susan Schelle, 1991

2008, Ron Reed

*i* A series of garden beds north east of the Salmon Run fountain promote diversifying urban ecosystems with native, drought-resistant plants that attract insects and other wildlife.

*i* "Woodpecker Column" (statue by Fastwürms 1997)

*i* Cross to the south side of Bremner Blvd, and east to the Roundhouse Park information plaque.

## 9 The Old Roundhouse



The Old Roundhouse

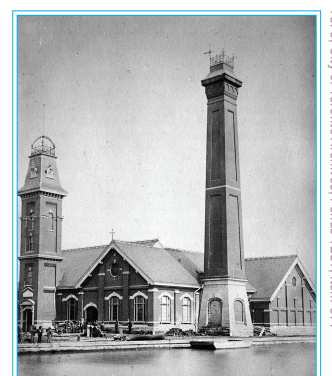
1929, City of Toronto Archives, Fonds 1244, Item 10058

The old John St. Roundhouse recalls an era when water, in the form of steam, was used for rail transport. Note the water tower behind the eastern end of the building that once provided a supply for the rail yard.

Today Steam Whistle Brewery occupies the eastern side of the Roundhouse. Steamwhistle uses Enwave district heating and Deep Lake Water Cooling, and purchases electricity from the wind and low-impact hydro supplier, Bullfrog Power.

## 10 John Street Pumping Station

Toronto takes all of its municipal drinking water from intake pipes that stretch far and deep into Lake Ontario. The water is purified in filtration plants and pumped at pumping stations through over 5,500 km of watermains to the city's businesses and 2.6 million residents. Toronto's water system is very energy-intensive: one third of that energy is used to pump water up to users as much as 133 meters above lake level. The cold deep lake water (4°C) is also used to chill the water in Enwave's closed-loop Deep Lake Water Cooling System.



The original John St. Pumping Station was located where the Rogers Centre is now.

1973, City of Toronto Archives, Fonds 1231, Item 677