

Leaky pipes hurting pocketbooks and sustainability in Ontario cities

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The study found that leakage fixed in a single section of York Region's water system saved 139,000 cubic metres a year in water, \$426,000 annually in cost and 4.1 tonnes of CO₂. Photo credit: pramot48, Adobe Stock

A new study suggests that cities such as Toronto could be wasting as much as 103 million litres of treated drinking water daily due to leaky or broken pipes.

The new study from the [Residential and Civil Construction Alliance of Ontario](#) (RCCAO), lays out the economic and environmental case for sustained investment in water infrastructure and

indicates that many Ontario municipalities are reporting an estimated leakage rate of at least 10%.

The leaks can be caused by bad pipe connections, internal or external pipe corrosion, or mechanical damage caused by excessive pipe load (i.e., by traffic). Other factors, the report suggests, could be ground movement, high system pressure, damage due to excavation, pipe age, winter temperature, defects in pipes, ground conditions, or poor quality of workmanship.

“The findings of this study are alarming because they confirm that our water infrastructure is aging and in dire need of repair,” says RCCAO executive director Nadia Todorova in a statement to media. “Governments must provide sustained funding to fix and replace these critical infrastructure assets. It’s incredibly inefficient and almost single-handedly defeating our water conservation goals when treated drinking water never makes it to the taps because of leaky pipes,” adds Todorova.

The study, [Water Infrastructure in the 21st Century: Smart and Climate-Savvy Asset Management Policies](#), was done by Tamer E. El-Diraby, a professor in the department of civil and mineral engineering at the University of Toronto as a follow-up to a similar study he did for RCCAO in 2009.

One analysis for the Town of Smiths Falls, near Ottawa, estimated that drinking water leakage rates between 2003 and 2019 ranged between 41% to 67%.

The study, which also looks at available methods to detect and forecast leaks, found that leakage fixed in a single section of York Region’s water system saved 139,000 cubic metres a year in water, and \$426,000 annually in cost, as well as 102 megawatt hours a year in energy, or 4.1 tonnes of CO₂. In Toronto, for instance, water and wastewater systems are the largest source of the city’s GHG emissions — estimated at around 30-35%.

“It is imperative that Ontario stay the course to preserve the value of its water infrastructure assets as well as embrace new asset management practices to make the infrastructure more resilient,” says El-Diraby, in a statement on the report. “We must pivot to face future challenges. If we let our guard down, the repercussions will be much higher than the simple issue of crumbling assets and lower levels of services,” he adds.

A 2018 survey of 308 water utilities in North America showed that the typical age of a failing watermain is 50 years. That failure age is concerning, the report says, because about 28% of all watermains have an age of 50 years or older.

The study notes that, in Toronto, 16% of the more than 6,000 kilometres of watermains are 80-100 years of age and 11% are more than 100 years old. The city experiences an average of 1,400 watermain breaks annually and replaces about 35 to 50 kilometres of watermains each year, meaning it is working on the assumption that the service life of a watermain is 110-166 years.

To manage leakage, the report suggests that municipalities may have to increase water pressure to prevent infiltration. The leaks can occur at service connections or on transmission mains, or through overflow at utility storage tanks.

“Some water is lost due to the lack of metering or inaccuracies of metering,” the report states. “Some [non-revenue water](#) is unavoidable — for example, water needed for new watermain commissioning and testing. Some are authorized but unbilled, such as water used for firefighting, while others are unauthorized and unbilled, such as theft.”

When proper funding is applied, positive results are achieved, the report states. For example, the City of Guelph was able to save 3.7 million cubic metres of water and over \$300,000 in electricity costs to treat and pump that water between 2006 and 2014, after consistently using a [water audit tool](#) jointly developed by the [American Water Works Association](#) and the [International Water Association](#).