WATER WOES

Rob Jowett

The Province of Ontario and its municipalities need to develop new infrastructure funding strategies in order to better protect municipal water systems and improve their efficiency, according to a new report by the **Residential and Civil Construction Alliance of Ontario** (RCCAO).

RCCAO released a report earlier this month on the state of water infrastructure in Ontario. The report assesses the state of municipal asset management in Ontario and makes recommendations as to how the province and individual municipalities can keep improving their water infrastructure, specifically by changing funding methods. Of particular concern and in need of investment are issues around flood risk and water leakage. The RCCAO report is the result of a province-wide study on municipal assets undertaken by researchers at the **University of Toronto**.

"We have learned a lot through implementing asset management," RCCAO executive director **Nadia Todorova** told *NRU*. "We've learned that when you defer infrastructure investments, that leads to asset value loss. It also leads to the reduction of service quality. It can also endanger public health and the environment. And ultimately, it leads to higher premiums on the upkeep of those assets."

The report makes three recommendations: that the province should continue its existing asset management strategies and provide greater funding for them, that provinces and municipalities should seize opportunities in green and digital economies like using more energy-efficient water treatment and distribution methods and reducing the use of unnecessary chemicals in treating water, and that water management policy should be more performance-driven and focus on achieving specific policy targets. In particular, more money needs to be made available by the provincial and federal governments to help municipalities on a case-by-case basis, rather than leaving it to municipalities to fund their infrastructure upgrades individually.

"This is not a call for just looking at the increase of funding, because that would be a temporary solution," report author and University of Toronto civil and mineral engineering department professor **Tamer El-Diraby** told *NRU*. "I look at funding as a symptom for an outdated business model. Where do we get the money, how do we allocate it, how do we find about their suitability—that is the problem."

El-Diraby says challenges faced by municipalities varies based on their size, but they fundamentally experience the same challenges. Small municipalities often do not have a tax base large enough to fund infrastructure projects, while larger cities like Toronto have massive systems with an exponentially greater number of areas where problems can arise.

In Ontario, water systems are typically managed by individual single-tier or higher-order municipalities, and do not cross jurisdictions. El-Diraby says that this is one of the largest challenges facing water systems management, as many urban areas like the GTHA function as one large, interconnected system and local water infrastructure uses and challenges often overlap. The fragmentation of water infrastructure management among municipalities across the province increases costs for all municipalities because it tends to be cheaper to work at scale than it is to micro-manage and operate in fragmented, independent systems.

El-Diraby says asset management related to water infrastructure became a priority following the Walkerton *E. Coli* outbreak in May of 2000, when six people died as a result of drinking contaminated municipal tap water. He says that since Walkerton, municipalities have developed better assets and more detailed knowledge about managing water systems than ever before, but that the water infrastructure system management in the province is still under-performing in some cases. He points to a recent example of systemic failure like the flood in Toronto in

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2018—when 70 mm of rain fell on the city within two hours, completely submerging some areas of the city because the storm sewer system could not handle the volume of water—as a reason why more improvements to the water infrastructure management system remain necessary. He notes that with global climate change, events like this will become increasingly common and provincial and municipal governments need to work together to stay ahead of the challenges.

Todorova says that making improvements to water infrastructure has benefits beyond protecting the water system itself. For example, she says leakage issues in infrastructure systems like municipal water pipes contribute greatly to greenhouse gas emissions because when pipes are leaky, a lot more energy is needed to push enough water through the system to meet demand. Leakage is a persistent problem in water systems across the province, and while across the province, municipalities lose an average of around 10 per cent of water to leaks, in some Ontario towns and cities the leakage rate can be over 40 per cent. Todorova says Toronto has consistently reported a leakage rate of about 10 to 15 per cent since 2004, which works out to a net loss of around 103 million litres of water per day.

"If you are looking to increase water system efficiency, and if you're looking to reduce water leakage, that is also one sure way to contribute to GHG emission reduction… because the water treatment and the water distribution are very energy-intensive processes," says Todorova. "The cost of the leakage is paid [for] by the end user. The [RCCAO] study found that [residents and businesses] are all charged 10 to 30 per cent more for water that we do not use."

The **City of Toronto** has a larger, more robust water system than many other municipalities in the GTHA due to its size, but the system is also facing tremendous pressure due to the city's rapid growth. The city, through its agency Toronto Water, currently has an operating budget of $468.8-million and a capital reserve contribution of $946.5-million, as well as a $14.8-billion plan for management and upgrades,

"Rapid growth in the city core and mid-town has been putting pressure on existing linear infrastructure," Toronto Water general manager **Lou Di Gironimo** told *NRU*. "Long-term strategies are needed to keep up with growth. Significant groundwater issues have also occurred over the past three years as deeper parking structures are being built."

Todorova says relatively small investments in infrastructure improvements can lead to major savings over time. For example, **York Region** recently made some repairs and upgrades to their water infrastructure system that saved around 139,000-cubic metres of water, saving $426,000 in operating costs, 102 megawatt hours per year, and 4.1-tonnes of carbon emissions per year. She says that the faster municipalities can make repairs to its water infrastructure, the more money can be saved and used for other things, either for funding other municipal programs or reducing user costs on water bills.