

Out of Sight, Out of Mind: The Infrastructure Deficit

BY JEFFREY REED

Out of sight, out of mind. If there's a phrase that captures the public's focus on water and sewer infrastructure, then that's it in a nutshell. Sexy infrastructure projects including roads and bridges dominated the podiums during Ontario's October municipal election. Yet according to recent studies, what lies beneath our roads and streets demands our undivided attention.

There are good news stories when it comes to being proactive in maintaining and improving sewers and waterways. For example, the 2021 federal budget made an additional \$1.375 billion available to the Disaster Mitigation and Adaptation Fund (DMAF) for investment in structural and natural infrastructure projects. The DMAF program involves a series of projects, including studies, environmental assessments, road works, sewer works, stormwater management works and pumping station works to address municipal areas that are prone to flooding, drainage complications and overall storm sewer capacity issues.

Still, alarm bells rang in August 2021 with the release of a report from the Financial Accountability Office of Ontario (FAO), which revealed that the province's municipal infrastructure backlog was \$52 billion in 2020.

The report reviews the infrastructure assets owned by Ontario's municipalities, estimating their current replacement value (CRV) and condition and the costs to bring these assets into a state of good repair in 2020. Ontario's 444 municipalities own and manage the majority of public infrastructure in the province, more than both the federal and provincial governments combined. Municipal infrastructure assets include roads and bridges, water systems, transit, and buildings and facilities.

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– RCCAO EXECUTIVE DIRECTOR, NADIA TODOROVA

The FAO estimates that the CRV of municipal infrastructure assessed in its report was \$484 billion in 2020.

"Despite the importance of municipal infrastructure to facilitate the day-to-day operation of the economy and society, a comprehensive municipal asset dataset does not exist,"

the report stated. "To undertake its analysis, the FAO compiled data from currently available sources to develop a comprehensive municipal infrastructure dataset."

Based on this dataset, the FAO estimates that 55% of municipal assets are in a state of good repair, with the remaining 45% of assets estimated to be not in a state of good repair.

The current cost to bring municipal assets into a state of good repair – to eliminate the municipal infrastructure backlog – is about \$52 billion, according to the FAO. Municipal roads represent the largest share of the infrastructure backlog at \$21.1 billion, followed by other buildings and facilities (\$9.5 billion), wastewater (\$7.3 billion), potable water (\$5.3 billion) and bridges and culverts (\$4.3 billion).

According to the FAO, "Maintaining public infrastructure in a state of good repair is generally the most cost-effective strategy over an asset's life cycle, although it is not the only consideration of municipal asset managers and may conflict with other budgetary priorities. Postponing repairs raises the risk of service disruption and increases the costs associated with municipal infrastructure over time." According to the report,

- Municipal water infrastructure, including potable water, storm water and wastewater, has a current replacement value of \$229 billion (47% of the municipal total).
- Due to uncertainty about asset condition estimates, the municipal infrastructure backlog could range between \$45 billion and \$59 billion.
- There are \$47 billion of municipal assets whose condition is unknown and not included in the FAO's infrastructure backlog estimates. If these assets were included, the size of the backlog would be larger.
- The Toronto economic region has the largest share of assets in a state of good repair at 62.3%, 7.6 percentage points higher than the province-wide average. The region also has the lowest infrastructure backlog relative to its CRV, indicating that its assets are in better condition relative to other regions.

According to OSWCA Manager of Government Relations and Public Affairs Steven Crombie, it is obviously more costly to bring back infrastructure into functionality on an emergency basis and less costly to be proactive. Crombie cites as an example a watermain break during the dead of winter. He likens the call for action to preventative dental work instead of a root canal.

"At some point you're going to have to address this issue and you're better off addressing these – let's call them, cavities – in our water and wastewater systems before you're doing root canal and extractions. And that's sort of the analogy that I would use because these systems have to be addressed as this is core, critical infrastructure," Crombie explained.

"To a lesser extent you can deal with potholes, but you can't as easily and quickly deal with water spewing up out of the road or wastewater finding its way into and backing up basements. Those are things that, if they fail, then it is imperative that they be addressed. And with \$52 billion of infrastructure that's considered to not be up to snuff – not in a state of good repair – then that's a big problem that needs to be addressed immediately."

In regard to Toronto's largest share of assets in a state of good repair, Crombie points to that city's aggressive 10-year capital works plan, which has worked towards the goal of being proactive in maintaining and bettering infrastructure.

LEAKY, BROKEN PIPES WASTING WATER

A revealing study from the Residential and Civil Construction Alliance of Ontario (RCCAO) released in June stated that millions of cubic metres of treated drinking water are being pumped into the ground every year across Ontario municipalities as a result of leaky and broken pipes.

The study, titled *Water Infrastructure in the 21st Century: Smart and Climate-Savvy Asset Management Policies*, was assembled by Tamer E. El-Diraby, a professor in the department of civil and mineral engineering at the University of Toronto. It is a follow-up to a similar study he did for RCCAO in 2009.

ACCORDING TO OSWCA MANAGER OF GOVERNMENT RELATIONS AND PUBLIC AFFAIRS STEVEN CROMBIE, IT IS OBVIOUSLY MORE COSTLY TO BRING BACK INFRASTRUCTURE INTO FUNCTIONALITY ON AN EMERGENCY BASIS AND LESS COSTLY TO BE PROACTIVE. HE LIKENS THE CALL FOR ACTION TO PREVENTATIVE DENTAL WORK INSTEAD OF A ROOT CANAL.

According to the new study, many Ontario municipalities report an estimated leakage rate of at least 10%. However, it also notes that reports by consultants who conducted actual assessments show that rates in Ontario could be as high as nearly 40%. One analysis for the Town of Smiths Falls estimated that rates between 2003 and 2019 ranged between 41 and 67%.

The study reports that the City of Toronto "has consistently reported a leakage rate of 10 to 15 per cent, which means it wastes 103 million litres per day. The volume of losses is equivalent to supplying the daily demand of a system servicing a population of about 250,000 people or filling more than 15,000 Olympic-sized swimming pools every year."

"The findings of this study are alarming because they confirm that our water infrastructure is aging and in dire need of repair," said RCCAO Executive Director Nadia Todorova. "Governments must provide sustained funding to fix and replace these critical infrastructure assets. It's incredibly inefficient and almost singlehandedly defeating our water conservation goals when treated drinking water never makes it to the taps because of leaky pipes."

The study makes three strong recommendations:

- Ontario should stay the course and continue to provide funds for asset management (AM) projects.
- Stable funding should be allocated to support an extended asset-energy-carbon analysis that will define the return-on-investment beyond the financial aspects of AM projects.
- Money should be provided for municipalities to adopt best practices, lead innovation, and develop accountable plans for investment and performance optimization.

According to the study, while there has been significant progress in AM awareness and mastery of best practices in Ontario, there is more work that needs to be done. For example, in 2018 a survey of 308 water utilities in North America showed that the typical age of a failing watermain is 50 years. In fact, about 28% of all watermains have an age of 50 years or older.

The study also notes that in Toronto, 16% of the more than 6,000 kilometres of watermains are 80 to 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's working on the assumption that the service life of a watermain is 110–166 years.

"When pipes get to a certain age, they fail," said Crombie. "It may not be a watermain break you see spewing up from the road, but there may be a leak. And when you compound those leaks over thousands of kilometres of drinking water pipes, the number is significant."

Todorova said a lot has changed since RCCAO's 2009 study. For example, she said a lot more Ontario municipalities have asset management plans – mandated by the province almost a decade ago. July 1st was the deadline for municipalities to have an approved asset management plan for core assets – roads, bridges and culverts, water, wastewater and stormwater management systems – that identifies current levels of service and the cost of maintaining those levels of service.

"Because of this, we saw in our most recent report that a lot more municipalities had a much better awareness of what assets they had, in particular when it comes to water infrastructure," said Todorova. "They're aware of, for example, how many kilometres of pipe they have, and the percentage which are in good condition, and how many of them are leaking. That gave us more data to include in our recent study so we could make more comparisons."

Still, Todorova echoes Crombie's thoughts that water and sewer infrastructure is out of sight, out of mind. "People forget about it, but then know about it when there's a huge leak, or when there's a large storm and sewers are backed up. And that's one of the

challenges with that infrastructure: it's not visible, whereas roads and bridges can dominate the focus," she said.

INFRASTRUCTURE IMPROVEMENTS DEMAND SIGNIFICANT INVESTMENTS

In mid-October, a new report by the Greenbelt Foundation offered further proof that growth should pay for more of the costs associated with growth.

The Greenbelt Foundation, a charitable organization solely dedicated to ensuring that Ontario's Greenbelt remains permanent, protected and prosperous, saw nine municipalities examined as part of its research, involving Halton Hills, Halton Region, Caledon, Peel Region, Waterloo, Waterloo Region, Markham, York Region and Hamilton. The report expressed that more efficient and integrated planning is needed to ensure municipal governments are generating revenue to address the financial needs of new development and infrastructure projects.

Referring to the FAO's announcement that the municipal infrastructure backlog in the province was estimated at \$52 billion in 2020, the Greenbelt Foundation stated how municipalities that raise their revenue can have a significant impact on the type, form, location and timing of growth, and therefore on growth management goals.

"Significant investment is needed to provide the municipal infrastructure and services that will be required to meet the demands of housing affordability, as well as our growing Ontario population and economy," said Greenbelt Foundation CEO Edward McDonnell.

"Through this report, we are seeking to highlight where a stronger connection between municipal finance and growth goals can result in more sustainable cities and communities that can grow while also providing a high quality of life for residents."

The report provided insights into how some municipalities are implementing innovative, money-saving strategies. For example, in 2016, Mississauga implemented a stormwater charge based on the total roof area of properties. The charge covers the full cost of operating and maintaining the stormwater management system for the city, discourages inefficient land use and rewards on-site controls to reduce stormwater runoff.

Continued government advocacy, according to Crombie, can go a long way in keeping maintenance and repairs to water systems at the top of the list, rather than at the back of the bus. He said, "Water and wastewater issues overlap all three levels of government. For example, the federal government has carbon reduction and climate mitigation strategy, which will include funding for storm water as we experience these 100-year storms – storms which we are now experiencing almost every year."

Said Crombie, "It really is out of sight, out of mind, when it comes to pipe failure. [OSWCA] continues to advocate for government to be proactive. After all, it is so much more cost effective when you involve re-construction, rehabilitation and system maintenance before you reach a critical stage in failure."