

FINANCIAL POST

Tuesday, March 9, 2010

Facing Canada's water woes

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Canwest News Service

Perhaps the biggest, most immediate problem with Canada's water infrastructure is buried, literally, under our cities and towns. The thousands of kilometres of underground pipes that move water from treatment plants to our taps is leaking -- spewing 13% to 30% of clean, drinkable water into the ground. At the same time, waste water and storm water systems can't keep up and are allowing pollutants to flow into rivers, lakes and oceans.

In 2007, the Federation of Canadian Municipalities (FCM) and McGill University released a wake-up call to policymakers and Canadians. Titled *Danger Ahead: The Coming Collapse of Canada's Municipal Infrastructure*, it pointed to a water infrastructure deficit tied to water supply and waste water and storm water systems on the order of \$31-billion. This was the estimated amount needed to repair aging infrastructure largely put in place in the 1930s and 1940s and maintained using under-funded budgets for decades. The FCM estimated another \$56.6-billion was needed to build new infrastructure to meet the demands of a growing population and new provincial and federal regulatory requirements.

"We are in a lot more trouble than we know," says Bob Sandford, chairman of the Canadian Partnership Initiative in Support of the United Nations' Water for Life Decade from his office in Canmore, Alta.

"The current state of our water infrastructure tells us we are vulnerable to our own institutional approaches to managing infrastructure. There is typically no incentive for municipalities and regions to operate and maintain water infrastructure efficiently. We have this myth that we have an overabundance of water. Our population is in the south and most of our water is in the north and our populations are growing. You are already beginning to have limits on all the purposes we want to put it to. It suggests to us that we ought to manage water infrastructure assets differently in order to be able to properly maintain and replace them in a timely way."

To be clear, this is not a bunch of engineers asleep at the switch, says Duncan Ellison, executive director of the Canadian Water and Wastewater Association in Ottawa. Part of the problem is natural wear and tear. For example, metal pipes corrode. The other part is funding. "Typically, the management strategy has been fix it when it's broken," Mr. Ellison says. "The frequency of water main bursts was the signal that a pipe needed to be replaced. In the last 10 to 15 years, technology has improved considerably in terms of the means of detecting when a pipe is likely to leak. These include things like inspection cameras and ultrasound equipment. Some municipalities have adopted these

technologies and techniques, but city engineers have to live within a budget based on revenues that are not up to the need. So the level of service drops, the frequency of breaks increases and people start complaining."

Still, this is only one of the challenges facing Canada's water infrastructure. In fact, says Tony Maas, director of WWF-Canada's Fresh Water Program in Toronto, there is a suite of problems that needs to be addressed.

For example, there is a nexus between energy and water that often goes unnoticed. It takes a lot of water to produce energy and a lot of energy to move water. "We are spending a lot of money treating this water to bring it to drinking water standards and then pumping it to where it needs to be."

On the environmental side, there is a need in many municipalities to upgrade waste water infrastructure to ensure we are not releasing pollutants into the environment, Mr. Maas says. He points to bacteria, nutrients such as nitrogen and phosphorous and emerging pollutants such as endocrine disruptors from pharmaceutical and personal care products.

In municipalities such as Toronto, where storm water was connected to the sanitary sewer system, big storms cause municipal waste water systems to overflow, releasing that polluted water into Lake Ontario. While cities are now building separated sewer and storm water systems to avoid this, there is simply not enough storm water infrastructure in place, Mr. Ellison says. "The fact is, until recently provincial regulations allowed waste water treatment plant bypasses into water bodies. And so cities were doing this in conformity with regulations. With the increase in public concern over environmental protection, this traditional practice is no longer acceptable to the general public." As a result, the city of Ottawa will now have to spend more than \$140-million over five years to reduce the frequency of overflows. This is one of the reasons it has raised its water rates by 10%.

Still, says Mr. Maas, who co-authored the research behind Clean Water, Green Jobs: A Stimulus Package for Sustainable Water Infrastructure Investments, these challenges pose a big opportunity to not only fix leaky pipes but also to change the way we use, develop and think about water infrastructure in our cities.

"The big opportunity is shifting away from large-scale built infrastructure to more decentralized solutions and measures that lead to conservation and reduce demand. Think rainwater harvesting, households moving to low-flow fixtures, industry undertaking water audits, universal metering so that we monitor all of our water use and charge accordingly. The OECD has described Canada's water rates as cheaper than dirt. That is an ongoing challenge."

And it is a big one. "We have underpriced our water across the country," says Len Coad, director Energy, Environment and Technology Policy for the Conference Board of Canada in Calgary. "More attention has to be paid to pricing water to fully recover the cost of producing it. More attention has to be paid to encourage us to use water wisely and efficiently. And more attention has to be paid to financial models that are effective and efficient at ensuring the infrastructure we need is in place and maintained."

A November 2009 Conference Board report, *Improving Infrastructure Management: Municipal Investments in Water and Waste Water Infrastructure*, concluded there is a correlation between the state of the infrastructure and the governance and financial management of the organization.

"If you look at Edmonton, Calgary and Regina, where the water authority is an independent corporation and has its own budget, you see rates and charges that are designed to ensure the infrastructure is properly maintained and is current and in good repair," Mr. Coad says. "Other municipalities where the allocation to water services is a municipal council budget issue are subject to political considerations and a desire to avoid raising rates.

"Our view is that financial and budgeting independence typically supports broader and more complete action and a plan for future growth. The best solution is to ensure the rates charged for water reflect the full cost of providing the service because that's how we ensure the resources needed are allocated to our water systems." And that service goes well beyond supply to environmental costs, such as source water protection and waste water processing.

Mr. Sandford would like to see a three-pronged approach addressing the challenges posed by the state of Canada's water infrastructure:

- Strengthen the systems in place and make sure those agencies that have jurisdiction are being responsible.
- Change the relationship between the provinces and federal government by examining how major watersheds can be managed in an integrated way.
- Look internationally for examples of a better way. The European Union Framework Water Directive, for example, sets water standards and charges each of its member states with achieving those standards and funding them.

"We are operating our water resources like it was still 1880," Mr. Sandford says.

"Most of our drinking water standards are voluntary. We have jurisdictional territoriality over water resources so water is managed differently depending on where you are.

"We need to reform our vision of water and create a new integrated water ethic in this country so that we are working together toward sustainability rather than working in an atomized way. Our urban water infrastructure is a thread you can pull that will radiate outwards to new ideas and opportunities."

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