

AN  
INNOVATIVE  
APPROACH  
TO  
SUSTAINABLE  
INFRASTRUCTURE

By Nicole Axworthy





**Most of Canada's infrastructure now requires special attention for renewal. The National Round Table on Sustainable Infrastructure is a strategy for meeting those needs—if only government would invest in it.**

**T**he issue of infrastructure renewal isn't terribly sexy. Most people don't care about wastewater treatment plants, and the term "infrastructure deficit" causes eyelids to droop and heads to nod. But when bridges start to fall down, they take notice.

While national engineering associations have been trying to call attention to the state of Canada's aging infrastructure for years, federal and municipal governments have been slow to take action. The impact of the September 2006 collapse of the de la Concorde overpass in Quebec, and the August 2007 plunge of the I-35W bridge in Minneapolis, created a sense of urgency and opened a window of opportunity—although tragically—to raise the profile of the issue.

In the last several years, Engineers Canada has taken a leadership role in creating the National Round Table on Sustainable Infrastructure (NRTSI), an independent, non-partisan, multi-stakeholder advisory body that could help facilitate decision making on sustainable infrastructure. With representatives from engineering and construction industries, First Nations, all levels of government, non-governmental organizations and academe, the round table aims to be a go-to resource on infrastructure and to help define issues of national priority.

The process of creating the NRTSI began in 2002 with a series of town hall meetings that resulted in a report called Civil Infrastructure Systems Technology Road Map. The report described the deteriorating state of Canada's infrastructure assets and, among other things, identified the need for a forum or round table to promote a more systematic, coordinated approach to strategic infrastructure planning in Canada. The initiative was led by four national bodies: Engineers Canada, the Canadian Society for Civil Engineering, the Canadian Public Works Association and National Research Council Canada (NRC).

In December 2005, these associations, in collaboration with close to 40 organizations, built on the TRM recommendation and met to discuss the creation of the NRTSI. The impact of the round table was expected to be far reaching and cross beyond jurisdictional boundaries to provide opportunities to access and share information on issues of technology innovation, best practices and asset management.

At the meeting, several priority concerns emerged: financing infrastructure, determining innovative practices, integrating diverse interests and helping small communities. Several working groups were formed to examine these issues and, in

May 2006, a second meeting of the working groups allowed them to report on their progress and to determine, as a group, the next steps that should be taken to turn the NRTSI vision into a reality.

On June 23, 2006, Engineers Canada, on behalf of the umbrella group of organizations that have been involved in the initiative, submitted a funding proposal to Infrastructure Canada to formally establish the NRTSI.

The proposal was turned down.

After that, the NRTSI stood in limbo for over a year, waiting to establish federal support that the former CEO of Engineers Canada, Marie Lemay, P.Eng., ing., said she couldn't wait long for. It's a tough sell—not to mention difficult and time-consuming—since government financing is being chased after for so many important initiatives. Unfortunately, the original proposal for the NRTSI involved funding

a secretariat. “They don’t have the mandate to fund a secretariat,” explains Marie Carter, P.Eng., director of professional and international affairs at Engineers Canada, who has taken over the project. “But they’re interested in the work that’s being done, and they’re interested in supporting *projects*.”

### Spending dollars wisely

Canada’s total infrastructure system is said to represent a \$1.6-trillion asset. Yet, despite its importance to the country’s long-term health, safety and economic viability, the system is looking at a debt of over \$60 billion and, according to a new Statistics Canada study, we have already used up 79 per cent of the service life of our roads, sewage systems and other vital components of the country’s backbone. Along with the need to renew the country’s infrastructure, there are concerns about its life cycle management and maintenance, environmental sustainability, and the need to develop reliable and harmonized methods to assess its condition. These problems hang over the heads of government leaders and policy makers, who are more sensitive to the need to expend public resources more effectively.

Just a few years ago, the federal government established Infrastructure Canada to provide a focal point for the government on infrastructure issues, and to manage infrastructure programs and coordinate investments in national and local infrastructure projects. And last year, the federal government announced its intention to move forward on a \$33-billion Building Canada infrastructure plan. Between 2007 and 2014, the plan provides more funding for provincial, territorial and municipal infrastructure projects—and for a longer period of time than any federal government has mandated since World War II. Types of projects to be funded under the plan include the core national highway system, public transit, clean water and sewage treatment infrastructure, green energy, and investments in international gateways and border crossings.

“Canada’s infrastructure deficit is certainly real, both in terms of the backlog on renewal and replacement, as well as the need to catch up with expansion to meet those needs,” says Michael Roschlau, president and CEO, Canadian Urban Transit Association, and chair of the NRTSI’s finance working group. “The Building Canada plan is a strong commitment on the part of the federal government, but it still falls short of the needs.”

### Building a partnership

As for the NRTSI, “nothing was really happening between June 2006 [when the government funding was denied] and now,” says Carter, “but we kept the entire round table membership informed of what the progress was, and what was coming along. So there was anticipation.”

And the wait may have been worth it. It turned out that both the NRTSI and NRC had approached the government with different proposals for funding, but with the same concept in mind. Infrastructure Canada saw the overlap and worked to get the two

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groups together, and on January 31, 2008, a contribution agreement was signed for a project with Engineers Canada on behalf of the participants of the NRTSI umbrella group, and in partnership with NRC’s Institute for Research in Construction. Additionally, Infrastructure Canada promised funding of \$800,000 under its Knowledge, Outreach and Awareness Program.

“The lack of full support [of the NRTSI] is disappointing,” says Roschlau, “but I’m pleased that Infrastructure Canada is keen on proceeding with this project and using the existing NRTSI network as a resource. To a large extent, it is a vote of confidence in the momen-

tum that has been established over the years.”

The project is a large undertaking: It involves both groups working together to establish reliable, practical and unified methods and tools to measure the condition, performance and management of Canada’s core public infrastructure (water and water systems, roads, bridges and transit). The development of these assessment tools will help infrastructure owners and operators assess the condition and performance of their infrastructure, and decision makers identify infrastructure renewal priorities. The nation-wide adoption and implementation of these approaches will also ensure all regions of Canada and levels of government have harmonized assessments.

Because of the size and complexity of the project, it made sense to do it in two phases.

The first phase of the project involves developing a framework, defining what indicators and performance measures would allow the assessment to happen, and identifying information sources that can be used. In developing the performance measures, the NRTSI participants are responsible for researching the non-technical factors, such as the potential impacts on the local economy, to complement NRC’s research on the technical side of things, such as the physical condi-

tions of bridges and other structures. Both the technical and non-technical working groups will then come together to create the framework for assessing the condition, performance and management of Canada’s infrastructure.

“We’re coming up with the tools, but we’re not even coming up with the full toolbox,” says Carter of the initial stage of the project. “We’re coming up with an agreement of what to move forward with for better definition within the infrastructure community.”

Other deliverables of phase one involve developing a five-year plan to implement the assessment as well as thinking up proposed projects to improve



five-year plan to Infrastructure Canada in November.

### Working together

The use of national, multi-stakeholder partnerships may be one area in which Canada is ahead of other nations in responding to infrastructure renewal challenges—although the high number of infrastructure agencies and differing responsibilities among the federal, provincial and local governments add complexity to the efforts. Because of this, it often takes a lot of time—sometimes years, like the NRTSI—for these types of industry groups to mobilize. “But it’s all worth it, since the time taken creates stronger bonds, better alliances and greater chances of success,” says Guy Félio, PhD, P.Eng., senior consultant, infrastructure engineering and policy, Dillon Consulting Ltd., in an article he wrote for *ReNew Canada*.

Because the non-partisan, multi-stakeholder focus of the round table model involves key members of all sectors of industry and government, it is best used to generate ideas and share information, knowledge and best practices to help decision makers maximize resources for more efficient and effective outcomes. This type of collaboration is particularly important to the infrastructure renewal challenge because many factors must be taken into account when planning and implementing infrastructure projects.

Several years ago, Engineers Canada took a similar approach to Canada’s need to adapt to climate change by leading the creation of the multi-stakeholder Public Infrastructure Engineering Vulnerability Committee (PIEVC) to begin investigating the impact climate change would have on existing and new infrastructure. The PIEVC received funding last year under the federal government’s Climate Change Impacts and Adaptation Program. It studied buildings, roads and associated structures, storm water and wastewater systems, and water resources. The resulting First National

Engineering Vulnerability Assessment Report, expected to be complete this spring, will ultimately be used to review codes and standards as well as engineering practices in designing, building and maintaining resilient infrastructure that can adapt to our changing climate.

Similarly, the NRTSI will have the opportunity to showcase how a multi-stakeholder, multi-sector group can add value to the process of ensuring the sustainability of Canada’s infrastructure. As Félio says, many of the round table participants have, over the years, been the “thinkers and drivers” behind infrastructure initiatives and projects, but they have worked mostly in isolation. Until now, the engineering, planning, finance, policy, political and other professions have rarely—or never—collaborated and worked hand-in-hand.

When Engineers Canada invited NRTSI stakeholders to come together with NRC in March to discuss the new project, more than 40 representatives still came back to the table after 16 months in limbo (the last NRTSI meeting was in November 2006). Says Carter: “They came to the meeting; they came interested; they were involved and engaged; they put their names forward to participate on the committees. There’s clearly an interest with the stakeholders that this is the right thing to do, and that we need to find the right mechanisms to do it over the long term.”

For the NRTSI to become established and succeed over the long term, however, it will require continuing support from all participants, including government. Carter explains that Engineers Canada will be talking to the round table participants separately about the options for funding the round table as an entity on its own. “Up until now, Engineers Canada has been representing the round table to the federal government, but we’ll see how that continues with trying to figure out a different funding structure for a secretariat for it.”

the performance of infrastructure, which will be identified by the original working groups of the NRTSI.

Phase two involves conducting a broad performance assessment of Canada’s core public infrastructure, based on the indicators developed in the first phase and using existing or available data. According to Carter, this will be done in the first year to 18 months of phase two. This phase will also involve participating and endorsing the development of the performance-based assessment tools, as well as moving forward on the proposed projects identified in phase one.

Since funding has only been approved for the first phase, a meeting of the NRTSI’s and NRC’s project participants is scheduled for September to discuss the work that has been done. They are expected to submit the framework and