



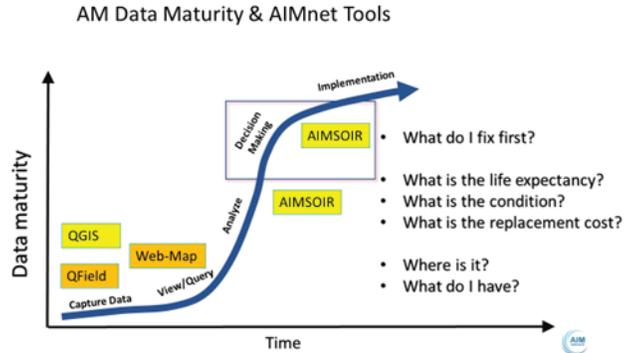
# WHAT DO WE DO FIRST?

FOR MANY OF today's cash strapped smaller municipalities, the ability to make informed decisions about infrastructure could mean the difference between staying solvent and incurring unsustainable levels of debt, or between safely and reliably delivering services and putting communities at risk of a service failure with serious social or health consequences. Whether a council is dealing with a declining population or navigating rapid growth, there's usually not enough money to do everything the community wants and needs in a given year, especially when a good chunk of its infrastructure was built long ago and needs attention or replacement. So, the tough question that council and municipal staff inevitably face at budget time is, "What do we do first and what can we defer?"

Now in full swing, AIM Network's peer learning cohort program is helping 34 municipalities across Atlantic Canada to answer that question. The program has been building their capacity in asset management since last September and is currently in its final phase, which is supporting participants with risk assessment and prioritization of infrastructure projects. Municipalities will be analyzing the state of their infrastructure for at least one asset class and developing strategies to ensure that the assets that pose the greatest risks to the community are dealt with first.

Tjaart Van den Berg is a principal with the organization Land-Info Technologies, a geospatial and information system consultancy. He is leading the technical support for this phase of the program alongside his colleague Matt Delorme from Hatch, a global multidisciplinary management, engineering and development consultancy. He notes that for this phase, the municipalities really need to dig into the data for at least one asset class in order to get a good handle on both the state of their infrastructure and how it stands up against the level of service the community wants and expects now and into the future. To get ready, many of the municipalities have had to put some time and effort into collecting, organizing and mapping the data for the asset class they selected. Van den Berg describes this as part of the process of developing maturity in asset management and following good practices. Before a council can begin to make an informed decision about what to prioritize, staff need to be able to give them a good analysis of what assets they have, where they are, what is the cost to replace them, what condition they are in, and what is their life expectancy. Part of Van den Berg and Delorme's role has been to help ensure they have

the data maturity required to participate effectively in this phase. They really need to be in the middle of the S curve in the graph below.



Van den Berg and Delorme are also part of AIM Network's technical committee and have been providing advice and guidelines around the development and use of aimSOIR, a GIS (geographic information systems) integrated spreadsheet-based tool that can be used by municipalities to report on the state of infrastructure including the replacement cost, annual reserves required, condition and projected expenditures. It also prioritizes infrastructure renewal based on risk through an analysis of Probability of Failure (PoF) and Consequence of Failure (CoF). Because it is an open source, free tool it is very cost effective for small municipalities like those in Atlantic Canada. Anyone can download the tool at [aimSOIR.org](http://aimSOIR.org), and the website also includes a discussion forum where people using the tool can ask questions or contribute knowledge.

The aimSOIR methodology is now being used widely by municipalities in Nova Scotia, Prince Edward Island, Newfoundland and Labrador, and British Columbia. While its development began in

## PARTICIPATING MUNICIPALITIES IN AIM NETWORK'S COHORT PROGRAM

| NOVA SCOTIA (SOUTH)    | NOVA SCOTIA (NORTH)  | PEI (LARGE)   | PEI (SMALL)   | NEWFOUNDLAND      |
|------------------------|----------------------|---------------|---------------|-------------------|
| Mahone Bay             | County of Antigonish | Charlottetown | North Rustico | Cow Head          |
| Annapolis Royal        | Port Hawkebury       | Summerside    | Tyne Valley   | Rocky Harbour     |
| Couty of Annapolis     | Town of Stellarton   | Kensington    | Crapaud       | Norris Point      |
| District of Yarmouth   | Town of Trenton      | Three Rivers  | Wellington    | Pasadena          |
| Town of Yarmouth       | Town of Westville    | Stratford     | Miscouche     | Steady Brook      |
| Municipality of Argyle | County of Victoria   | Cornwall      | Victoria      | Massey Drive      |
| Shelburne              |                      |               |               | Glenburnie-Birchy |
| Lockeport              |                      |               |               | Head-Shoal Bay    |

(Continued from Page 1) BC, those involved have been able to refine it with generous support from AIM Network and the Federation of Canadian Municipalities (through its Municipal Asset Management Program). The government of Nova Scotia also provided guidance on its refinement and supports the methodology and format used in the software. It's likely that other governments in Atlantic Canada may soon follow suit. This has provided the municipalities in the cohort program with the confidence needed to dedicate time and human resources into integrating their data into the tool, and all of them are using aimSOIR.

Municipalities come to the first prioritization workshop with their data already integrated into aimSOIR and with three separate maps produced with the help of Van den Berg and Delorme. One shows the assets and their associated default probability of failure, calculated based simply on the age of the infrastructure in relation to its expected design life. The second map shows the assets and their associated consequence of failure, calculated based on some standard assumptions that consider the social, economic, health, environmental, legal and political consequences of each asset failing. For example, it would be assumed that a fire hydrant has a higher consequence of failure than a valve attached to a small water pipe. The third map provided is one that shows the default risk associated with the assets, which is based on a simple equation (the default probability of failure X the default consequence of failure).

The municipalities' task at the first workshop is to take a look at their default values and make adjustments based on staff knowledge of the actual condition of the infrastructure and what they know about their service gaps and performance targets for their core services, analysis the municipalities did in an earlier phase of the program. Another important factor they build into their analysis is how climate change may impact the infrastructure. Prior to the workshop, municipalities participated in an online session that informed them about short-term, medium-term and long-term trends that could put their infrastructure at risk of failure. These could include trends around storm surge, extreme weather events, changes in precipitation, flooding, erosion, etc.

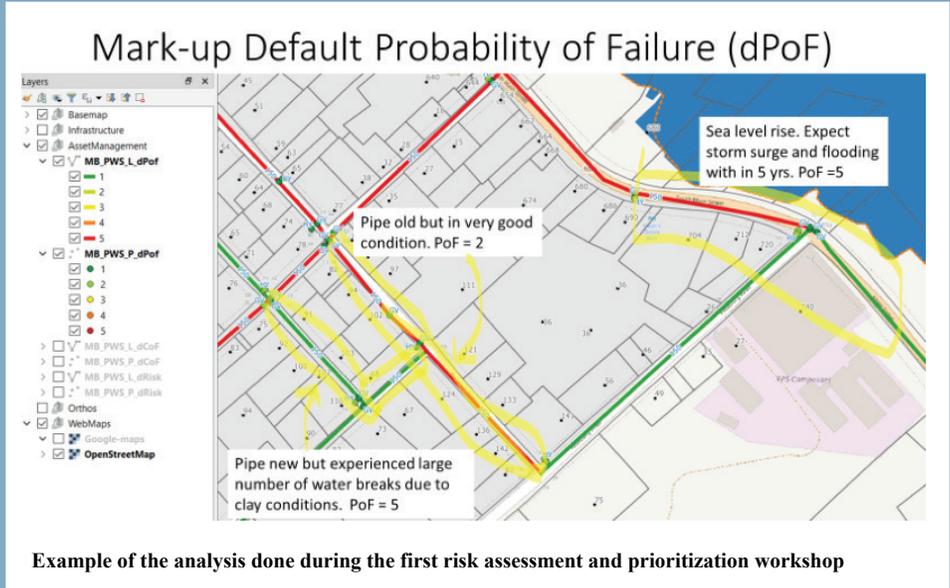
By the end of the workshop, the municipalities have a good analysis of their critical assets, which are the ones that pose the highest immediate risk to the community and need attention immediately. The map above provides an example of the type of analysis that each municipality does during the workshop.

Once the municipalities have identified their critical, high risk assets, they are ready to prepare for the final workshop, which is usually scheduled to take place about three months later. The municipalities are responsible for updating their probability and consequence of failure values in aimSOIR, for producing updated risk maps and an updated risk report, and for generating preliminary renewal cost projections based on risk.

During the final workshop, which for most cohorts are happening in early Fall, municipalities will come up with a strategy in terms of how to address their biggest risks based on the big picture of all the work that lies ahead of them. Their strategy could be to change the risk tolerance by adjusting level of service (e.g. closing a bridge to vehicles and keeping it accessible only to pedestrians and cyclists), or often the most important take-away from the process is that it's not necessarily appropriate to deal with the oldest infrastructure first. An old pipe may still present a very low risk to the community and be able to function well beyond its assumed design life, so council would be well advised to focus on assets that pose a greater risk to the community. The final step in the process will be to develop a realistic 15-20-year financial plan that is aligned with their priorities.

While the final deliverable for the program won't be an asset management plan per se, it will provide the municipalities with a good start on one asset class and will have laid the foundation they need to make progress. The intention is that the internal capacity built from having their municipal teams involved from the outset will enable

them to continuously improve and develop more robust asset management programs and plans. The other feature articles in this newsletter share stories about two of the municipalities that have completed the first risk and prioritization workshop. There is no doubt that the process has opened their eyes about the priorities they need to address first.



Example of the analysis done during the first risk assessment and prioritization workshop

Interview with **Tjaart Van den Berg**  
Principal, LandInfo Technologies Inc.



**IN THIS ISSUE**

- 1 → **What Do We Do First?**
- 3 → **Building Asset Management Practices in Atlantic Canada**
- 4 → **Getting a Handle on Drinking Water Services in Victoria County**
- 6 → **Identifying Critical Assets in Annapolis County**
- 7 → **Calendar of Events**

# BUILDING ASSET MANAGEMENT PRACTICES IN ATLANTIC CANADA

## LESSONS FROM AIM NETWORK'S COHORT PROGRAM

Many aspects of asset management are still relatively new in the Atlantic region and municipalities that are at the early stage will be able to benefit from the insight and experience of the cohort participants.

Municipalities in AIM Network's Cohort Program have made significant inroads since last year and by the end of the program this Fall, they will have:

- developed an understanding of the state of their core infrastructure assets
- created a draft asset management policy for Council adoption to set direction
- drawn up a roadmap/workplan to identify first steps in asset management planning
- analyzed their levels of service and identified gaps and targets for service delivery
- prioritized assets for renewal and replacement considering risks, such as climate risks, service levels, community values, etc., and
- identified critical infrastructure and prepared long-term cost projections for renewal and replacement.

The 34 municipalities included in the Core Program are listed on page 1 of the newsletter. A sub-set of the cohort participants from PEI and Nova Scotia have also participated in a Community Engagement stream of the program undertaking a community engagement project around asset management and service delivery.

Join AIM Network at **two upcoming events** where both council and staff who have been involved in the program will share their knowledge and advice with other municipalities starting their asset management journey.

### Thursday, September 5, 2019: Lessons from the Newfoundland Cohort

On September 5th, the Atlantic Asset Management Conference will have a dedicated program stream that will share knowledge and lessons from the Newfoundland cohort. The conference will take place in St. John's on September 5-6th.

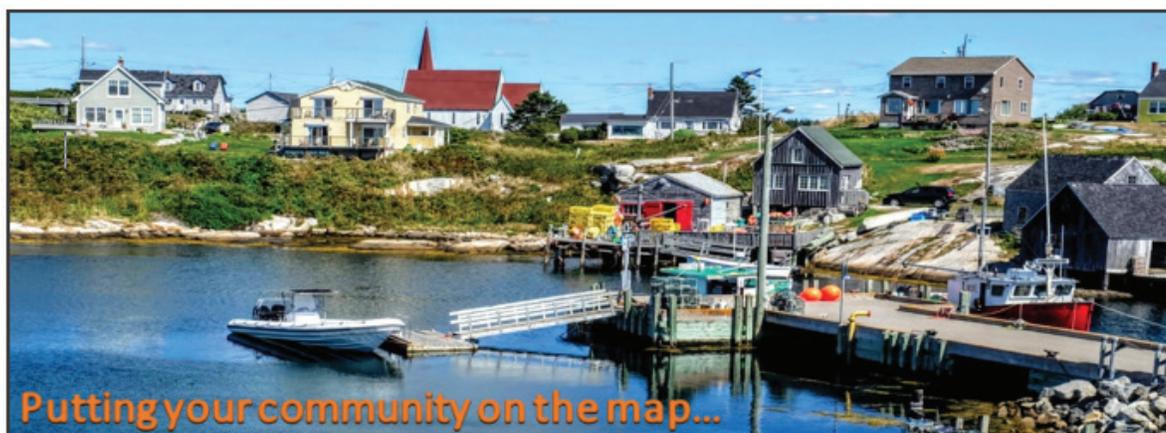
Register at this link: [aimnetwork.ca/conference](http://aimnetwork.ca/conference)

### Friday, September 27, 2019: Lessons from the Nova Scotia Cohorts

AIM Network is organizing a one-day workshop under the theme Building Asset Management Practices in Nova Scotia that will share knowledge and lessons from the Nova Scotia cohorts. The conference will take place in the Halifax area (specific location to be determined). Stay tuned for the link to register. You can also contact **Daisy Foster** at [dfoster@aimnetwork.ca](mailto:dfoster@aimnetwork.ca) to reserve your spot.



AIM Network is pleased to have received generous support from the Federation of Canadian Municipalities and Government of Canada to share the knowledge developed by municipalities in its cohort program more broadly across Atlantic Canada.



Land•Info  
Technologies Inc

- Municipal Infrastructure Management
- Geospatial Information Systems

[www.landinfotech.com](http://www.landinfotech.com)

Putting your community on the map...

# GETTING A HANDLE ON DRINKING WATER SERVICES IN VICTORIA COUNTY

**Robert Dauphinee recalls** that when he went to school in Ontario years ago, some of the bigger adjustments he had to make were living in a dense and diverse urban environment and navigating the busy Highway 401. And while he enjoyed his student life, Dauphinee jokes that he spent a lot of time convincing his student friends to visit him in the paradise he calls home in Victoria County, Nova Scotia, a municipality that covers about 2,800 square kilometres with a population base of only around 7,000 people. While his friends presumed he came from a rural backwoods that had barely entered modern Canadian life, he knew his home to

be a network of thriving small communities with many of the same amenities they had, with the added bonus of being nestled amidst the stunning back drop of both the Atlantic Ocean and the rugged Cabot Trail.

Now Dauphinee dedicates his life to ensuring the residents of Victoria County will continue to benefit from safe and reliable local services. He is the director of public works for Victoria County and has been participating in AIM Network's asset management peer learning program alongside his multi-disciplinary team, which includes a councillor, the CAO, finance and other public works staff. He says they've appreciated the staged approach the program has taken because it's been very effective in building the internal capacity of staff over several months and has also enabled council to understand the scope of the challenge in delivering services sustainably, in a way that's affordable over the long-term. Victoria County is part of the northern Nova Scotia cohort, which also includes Antigonish County, the Towns of Stellarton, Westville, Trenton and Port Hawkesbury. Now in the final phase of the program, the cohort recently completed the first of two workshops on

risk assessment and prioritization of infrastructure projects. The article "*What Do We Do First*" on the front page of this newsletter describes what's involved in the final phase.

Victoria County provides waste collection and recycling services and is responsible for maintaining a few kilometres of road, but it's their potable water systems that take the most effort and require the biggest expenditure. Naturally, it made sense that the County would choose to focus on its water assets for this phase of the program.

The County has a water utility and four different water supply and distribution systems, all of which are quite small and challenging to maintain because of the small customer base that pays for them. Like all water utilities in Nova Scotia, their operational costs must equal their revenue. They aren't serving any large industrial client, so the revenue they bring in is limited. Instead, the main economic driver in the region is tourism, with a peppering of fisheries and forestry mixed in. And like many other parts of Atlantic Canada, it's not a young demographic. The average age is about 45 and



THE STUNNING KELTIC LODGE IN INGONISH ON CAPE BRETON ISLAND IS LOCATED IN VICTORIA COUNTY, NOVA SCOTIA

(Continued from Page 5) about 25% of the population is over 65. The other challenge with the water systems is their age. The oldest were constructed in the early 70s and the newest in the mid-90s. They've been struggling to ensure their older systems are kept up to meet the latest and more demanding regulations while also trying to stretch out the life of the systems to the extent possible without compromising service.

Dauphinee appreciates the work his public works team did to get ready for the first risk and prioritization workshop. They needed to spend quite a bit of time collecting and organizing data to the extent that for three months in advance, they met weekly or bi-weekly, constantly reviewed their data and worked closely with Tjaart Van den Berg to integrate it effectively into aimSOIR, the open source asset management tool they are using. Van den Berg is one of the technical leads and facilitators for this phase of the program. Dauphinee says that strangely enough, all this work has been a welcome surprise, because it's enabled them to take a close look at every piece of water infrastructure they own.

He had recently hired new staff in the water utility who were able to build their knowledge as a result of working on the project. And because the County doesn't have a staff person experienced in geographic information systems, they benefitted greatly from the technical support provided to help map the data correctly. Now that their asset management system is set up, Dauphinee is very pleased with how user friendly it is and is confident they have the knowledge they need in-house to make regular updates. He says their new operators are like sponges and are very excited to learn. They also tend to be

more plugged into new technology than the more senior staff, so that provides good balance to the team.

There have been some really important eye openers for the team in doing the risk assessment. A big one comes from their deeper understanding of the climate risks that may impact their water infrastructure. They know that climate change will affect their drinking water source, whatever that source may be. And they've determined that some of the infrastructure is at high risk in the case of flooding. Some of their distribution system goes through brooks and streams and if there is a big washout it could affect their supply. They need a strategy to manage that.

The process has also made them look at the design life of the infrastructure versus the criticality. Dauphinee says that one of the benefits of having smaller systems is that staff have a very good, if not intimate knowledge of them. They know that because the systems service a small, spread out population, there is limited wear and tear and the design life can be considered a minimum. They are now confident about which parts of their systems can likely last quite a bit longer than expected without failing, and which parts need attention or replacement. As a result of this, public works has been working closely with the finance department to get a better understanding of the financial limitations they are dealing with to manage their systems effectively. At the same time, the finance folks are getting much more of an appreciation of the operational requirements.

Dauphinee says they know their infrastructure is going to fail over time and need to be replaced, but he feels their state of infrastructure report is going to tell them

where they need to spend their dollars over the next 15 – 20 years. He said that he sometimes felt they were just going along waiting for problems to happen before, and now they're able to properly address the things that need more maintenance.

On the political side, council is at an early stage of developing an understanding of asset management and Dauphinee feels this will support them in addressing the community's requests for service from a more informed position. Just recently some residents asked the County to extend the water system to them, because they still depend on their own well water, which hasn't always been reliable. Now staff will be able to bring council a recommendation for requests like this that are based on the full costs and risks of building, operating and maintaining an expanded system over its full life, combined with an analysis of future development and growth in the County. Rather than simply bowing to public pressure, council will have a sound basis to determine whether an expansion is affordable and sustainable over the longer term, and a defensible position.

Dauphinee is looking forward to the final workshop, when they'll have an opportunity to tie all their analysis together and flesh out their financial and risk management plan.

Interview with  
**Robert Dauphinee,**  
Director of Public Works  
Victoria County, Nova Scotia



**WE ARE  
PLACEBUILDERS™**

**TRACTCONSULTING.COM**



LAND USE PLANNING  
LANDSCAPE ARCHITECTURE  
ASSET MANAGEMENT PLANNING  
CIVIL ENGINEERING

# IDENTIFYING CRITICAL ASSETS IN ANNAPOLIS COUNTY

**Annapolis County is a typical rural Nova Scotia story.** Its population of about 21,500 people are spread out over 3200 square kilometres in the southwestern part of Nova Scotia. They live in small communities, many scattered along the shore of the Bay of Fundy, from Bear River in the west to Greenwood in the east. They County's population is aging, like most of its infrastructure. It has inherited infrastructure from Bridgetown that dates back as far as 1856, and even the "newer" water and wastewater infrastructure was built in the 1960s, 70s or 80s and has yet to be modernized.

But while Annapolis County shares these characteristics with other municipalities in Nova Scotia, the specific services they deliver and the conditions around which they deliver them are unique. That was one of the key insights that James Stronach has taken from participating in AIM Network's asset management peer learning cohort program this past year, especially salient now that they are working on assessing risk and prioritizing their infrastructure projects. He is an engineering technician working under the director of municipal operations, and his job portfolio spans a wide range of responsibilities, from asset management, to project management, procurement and facilities management.

When they went to the first risk assessment workshop in May, the biggest risk they identified for their water and wastewater infrastructure was not that surprising. The County is responsible for maintaining four potable water systems and four wastewater systems under two separate water utilities. Much of their infrastructure is fast approaching the end of its useful life and some is already past its design life. Stronach says that going through the process helped to confirm their assumptions, notably that some of their infrastructure in the centre of Bridgetown is quite old and needs replacement. Putting some actual numbers and work estimates on the cost of revitalizing the system and timing around when the work should be done to maximize the benefit to the community has been very beneficial.

The big eye opener for the team though, has been getting a better understanding of the critical assets. All the municipally owned potable water infrastructure is centrally distributed and they use groundwater sources that require a robust treatment system. In Bridgetown, the water distribution system is north of town and there's a few kilometres between the main well and the storage tank. If there's a break anywhere along that distribution pipe, there is no way for the water to get to the storage tank and within a short period of time the water supply could be severely limited. The criticality and risk assessment reinforced for them that they must ensure that the feeds going to and from the reservoir are carefully monitored and in good condition. Fortunately, those pieces are not at great risk of failing now and the expenditure to maintain them is negligible because they were only installed in 2010. But the consequence of them failing is very serious, so those assets rise to the top in terms of their management requirements.

The larger concern for Annapolis County regarding maintenance and re-capitalization costs are the pipes that distribute water from the storage tank, some of which were installed in the 60s or 70s. They will be monitoring those pipes for breaks and where parts are continually failing, the focus will be to re-capitalize those first. That said, another big lesson for Stronach was that fixing the worst thing first may not be the best decision even though it may be the natural inclination. Statistically, it's a more cost-effective strategy to fix the assets that are just starting to deteriorate than to completely replace a very old asset, unless the old asset is a critical piece of infrastructure of course. It's less expensive to bring an asset back from a fair to a very good condition than it is to spend a lot on replacing an old one.

Stronach's advice to other municipalities embarking on this stage of their asset management journey is that there will need to be a substantial investment of staff time to do the process justice and it can't be a one-person effort. For this phase of the program they decided to focus on the water system in the Town of Bridgetown only to make the scope manageable. Still, the preparation for the workshop probably took the better part of a 40-hour work week even though they already had some data digitized. He spent a good amount of time confirming the accuracy of the data with operations and field staff

and along the way has required input from finance. He's appreciated the aimSOIR open source asset management tool they are using, and the fact that the provincial government has collaborated on its refinement has given them confidence in setting it up.

Stronach says it has also been essential to have strong support from the executive and from council, which he feels he's had despite navigating some staff losses or absences during the process. But if the County could start the program all over again, he would suggest adding one or two elected officials to participate in the process. He's observed that the municipalities in the program that have had that stronger presence and active involvement seem to have been able to advance more quickly, and the more involvement you can get from all the stakeholders, the better.

Stronach has no doubt that all the effort to date has been worth it. The immediate outcome is that they've been able to generate hard numbers that will form the basis of a future asset management plan and in the meantime, the County has developed knowledge related to what they need to focus on fixing now. It's been an important building block to developing a much more robust asset management program, which he is confident that one way or another will eventually be a requirement even though the Province doesn't intend to regulate right now. Both the provincial and federal governments want to ensure that infrastructure dollars are being spent wisely, and so does Annapolis County.



People enjoying the Fall colours in Valleyview Park, Annapolis County

Interview with **James Stronach**,  
Engineering Technician  
Annapolis County, Nova Scotia



# Calendar of Events

## ATLANTIC ASSET MANAGEMENT CONFERENCE

SEPTEMBER 5-6, 2019  
ST. JOHNS, NL

Registration is open for the Atlantic Asset Management Conference in St. John's, NL. Hosted by AIM Network, the conference theme "Piecing It All Together: Awareness to Implementation" will bring a wide range of municipal staff, elected officials and others in the region who will be sharing knowledge and collaborating to improve municipal asset management planning and practices. The program is shaping up to be a showcase of technical excellence combined with storytelling about the progress municipalities are making in the region. There will be a dedicated conference stream on Day 1 that will share knowledge about the lessons and results of participating municipalities from AIM Network's Newfoundland cohort.

If you're a cohort participant and would like to contribute to this program stream, please contact **Donna Chiarelli** at: [donna@cormerelli.com](mailto:donna@cormerelli.com).

For more information and to register for the conference: <https://www.aimnetwork.ca/2019-conference>

## BUILDING ASSET MANAGEMENT PRACTICES IN NOVA SCOTIA:

SEPTEMBER 27, 2019  
HALIFAX AREA, NS

### LESSONS FROM AIM NETWORK'S COHORT PROGRAM

AIM Network is hosting a one-day workshop to share the lessons and results of participating municipalities from AIM Network's Nova Scotia cohorts. The program will enable municipalities from the region to learn about the core tasks that municipalities undertook during the program, including creating roadmaps, developing current and target levels of service and prioritization of infrastructure projects. They will also gain insight into the results from community engagement activities that municipalities implemented and learn from elected officials about how being involved in the program is helping them make better informed and strategic decisions while politically navigating the tough ones.

For information about how to register, contact **Daisy Foster** at: [dfoster@aimnetwork.ca](mailto:dfoster@aimnetwork.ca).

If you're a cohort participant and would like to contribute to the workshop, please contact **Donna Chiarelli** at [donna@cormerelli.com](mailto:donna@cormerelli.com).

## DID YOU KNOW?

Municipal staff and elected officials may be able to use their Gas Tax funding to cover registration and travel costs for these capacity building events. Check with your Province to confirm the requirements.

Daisy Foster,  
MANAGING DIRECTOR, AIM NETWORK  
[dfoster@aimnetwork.ca](mailto:dfoster@aimnetwork.ca)

Donna Chiarelli  
WRITER AND EDITOR  
[donna@cormerelli.com](mailto:donna@cormerelli.com)

Jeffrey Elliott  
GRAPHIC DESIGN  
[jeffreythomaselliott@gmail.com](mailto:jeffreythomaselliott@gmail.com)

This newsletter is provided with support of the Municipal Asset Management Program which is delivered through the Federation of Canadian Municipalities and funded by the Government of Canada.

Canada

FCM

FEDERATION  
OF CANADIAN  
MUNICIPALITIES

FÉDÉRATION  
CANADIENNE DES  
MUNICIPALITÉS