

Water and Wastewater Asset Management Readiness Assessment

Spring 2019



Results from the 2018 Water and
Wastewater Asset Management
Readiness Survey in Ontario

Acknowledgements

This project received valuable input from several professionals connected to asset management. To them, our deepest appreciation and gratitude.

Amanda Sutton and Joshua McCann - Ministry of Infrastructure

Beatrice Yung – City of Toronto

Bill Garibaldi – MTE Consultants

Chris Chen and Sam Sidawi - Asset Management Ontario

Kirsten Brouse – Federation of Canadian Municipalities

Milos Posavljak – City of Waterloo

Nick Larson - GM BluePlan Engineering

Rizwan Younis – Centre for Advancement of Trenchless Technologies

Salman Zafar - Association of Municipalities of Ontario

Our special thanks to the organizations that have kindly helped with survey promotion and distribution.

Canadian Network of Asset Managers (CNAM)

Canadian Water and Wastewater Association (CWWA)

Canadian Water Network (CWN)

Ontario Water Works Association (OWWA)

Water Canada

The Water and Wastewater Asset Management Readiness survey is funded and supported by the Centre for Advancement of Trenchless Technologies (CATT) and the Southern Ontario Water Consortium (SOWC). Many thanks to Brenda Lucas from the SOWC for her time and commitment to the project. Acknowledgement is also in order to the University of Waterloo, for providing the needed infrastructure for this study.

Finally, the authors would like to recognize the efforts of the 31 municipalities that participated in this survey, providing invaluable data and insights on their current asset management practices.

About the Authors



Anelisa Schmidt is a Master Candidate at the Civil and Environmental Engineering department at University of Waterloo. Anelisa's research is focused on how the transformative tools of infrastructure asset management can change the water and wastewater industry by creating a new mindset for capital investments. She has eight years of international experience in the water industry, which are key to understand the asset management framework in Canada and worldwide. Working as a project manager for a water utility that provided services for 13 million users of diverse backgrounds, she also had to juggle short- versus long-term decisions when managing assets. She believes that survey results can help create awareness towards the current asset management readiness level in municipal water utilities in Ontario and provide direction and support for the development of policies and guidelines in Canada and internationally.

Mark Knight is an Associate Professor in the Department of Civil and Environmental Engineering at University of Waterloo and the Executive Director of the Centre for Advancement of Trenchless Technologies (CATT). Dr. Knight specializes in buried pipeline soil structure interaction, buried municipal water and wastewater pipeline condition assessment, repair, renovation and construction using trenchless technologies. Over the past ten years Professor Knight and his team at Waterloo have been developing new approaches and tools for the water industry that can help ensure that water systems are financially sustainable over the next 50 years and can help water utilities eliminate their infrastructure backlog. He has also developed and taught water infrastructure asset management courses. In 2018, Dr. Knight was awarded the Pioneer Award by the Canadian Network of Asset Managers (CNAM). This award honours individuals who have played an integral role in advancing the asset management industry in Canada and celebrates their long-term commitment and unwavering dedication to the asset management industry.



Disclaimer

Findings presented in this report are the authors' analysis of the data provided by survey participants. The survey results are presented "as is", without liability for their use, and to provide general industry trends.

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Executive Summary

This document presents the results of the 2018 Water and Wastewater Asset Management Readiness survey, supported by the Centre for Advancement of Trenchless Technologies (CATT) and the Southern Ontario Water Consortium (SOWC).

The main purpose of this study is to assess the current asset management readiness level of Ontario municipal water utility companies while providing direction and support for the development of policies and guidelines. With the purpose of identifying how municipality size shapes the adoption of the asset management framework (i.e. strategy, policy, plans), the survey results are presented in an aggregated format and divided into three categories – small, medium and large municipalities.

Additionally, the study investigates whether Asset Management Plans are being used as sources of information for evidence-based decision-making. The existence of a plan without the support of asset management processes does not guarantee that assets are well managed. For that reason, several questions sought to identify whether plans are truly being used and how they are being used – for instance, whether plan implementation is monitored.

The survey offered the opportunity for respondents to receive an individual benchmark report that presented the municipality's readiness level in comparison to the aggregated results of all respondents from the same size category. The objective here is to create awareness towards asset management capacity and to provide a simple readiness assessment tool to municipal water utilities. It is not the intent of this project to replace any of the existing and more detailed assessment tools.

Regulations and guidelines push municipalities to improve asset management practices, with benefits ranging from lower operational costs to safer systems. Ontario has accomplished substantial progress regarding asset management, and progress measurement over time is key to identify areas that need attention and support, as well as to better inform policy.

After introducing the subject and presenting the survey methodology, Part 1 of this report provides background information about the participants while Part 2 provides an overview of key survey results in each competency area. Finally, Part 3 discusses the key takeaways from this survey. Readiness levels descriptions, additional results, and survey questions are provided in Appendixes I, II and III, respectively.

Key findings

- 57% of small, 50% of medium and 55% of large municipalities do not have a process to monitor Asset Management Plan implementation.
- Not all leadership asset management roles and responsibilities are clearly defined for 72% of small, 50% of medium and 55% of large municipalities.
- Assets' Levels of Service are not specified in the Asset Management Plans of 31% of small, 50% of medium and 18% of large municipalities.
- 28% of small, 33% of medium and 9% of large municipalities do not have a process in place to identify funding gaps.
- The Asset Management Plan is the main source of information for planning and decision-making for 36% of small, 17% of medium and 45% of large municipalities.
- 70% of small, 67% of medium and 82% of large municipalities attend at least one asset management event per year.
- 29% of small, 33% of medium and 28% of large municipalities do not have an Asset Management Policy, even with the ON Reg. 588/17 deadline of July 2019 quickly approaching. For 39% of all respondents, climate change is not considered in Asset Management Planning.

Key takeaways

- This survey establishes the asset management readiness level baseline in Ontario for small, medium and large municipal water utilities.
- Large municipal water utilities are approaching and/or achieving Readiness Level 1 - LEARNING and are moving towards Readiness Level 2 – DEVELOPING, while Small and Medium municipal water utilities are on the way towards Readiness Level 1 - LEARNING.
- Water utilities in Ontario are just starting their asset management journey. However, the benefits of better asset management have been realized. As a result of provincial regulations, municipalities are continuously encouraged to improve their asset management processes. Sustained support and funding for asset management programs are of vital importance.
- Implementation of this survey every two years will help evaluate how water utilities are improving in their readiness levels and the impact of policies on readiness levels.

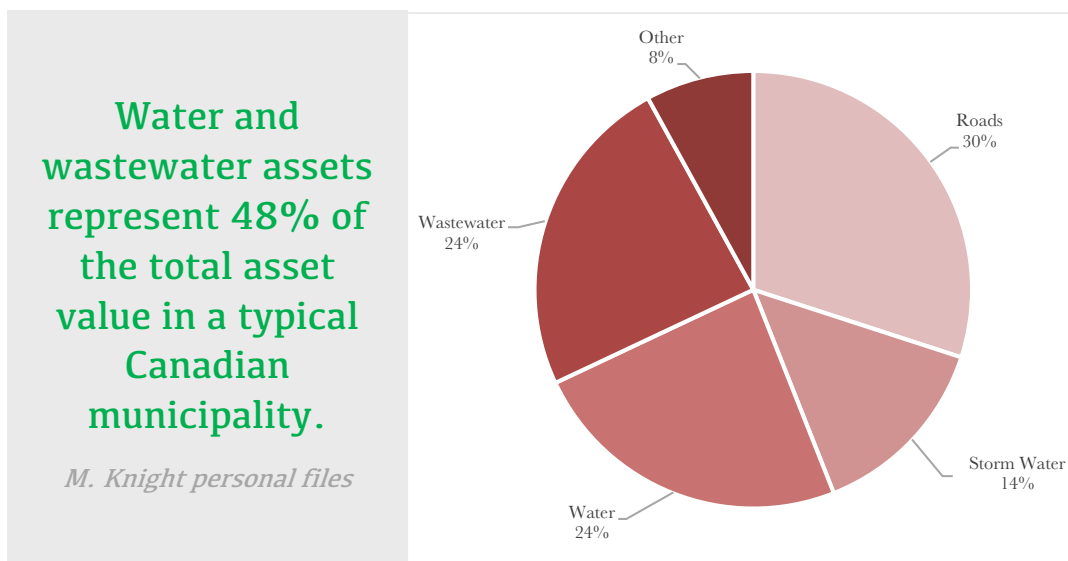
- Information is required by water utilities on how to link financial and performance data to Levels of Service, and how to add current and future Levels of Service to Asset Management Plans.
- Significant improvement in internal asset management communication is necessary to achieve organizational goals more efficiently. Knowledge dissemination of key documents (i.e. policy, strategy, plan) and actions will help empower teams to make better decisions.
- Municipalities are struggling to integrate climate change to asset management practices. The development of guidelines with clear information on how to do this would be extremely helpful.
- The focus on establishing robust and adequate asset management processes to support investment decisions and prioritization is invaluable and should be encouraged.



Introduction

High quality and safe treated surface and ground water is delivered to houses and businesses through a series of transmission and distribution pipelines. The used water is contaminated to become wastewater that flows down drains into a series of collection pipelines that are connected to wastewater treatment plants. Provision of clean potable water to businesses and homes is an essential service that many Canadians take for granted with high expectations to perform without loss of service and at a low cost. Water utilities ensure that aging and deteriorating pipelines continue to perform as designed and at the lowest possible cost to end users.

The figure below shows the distribution of asset values, based on replacement value, in a typical Canadian municipality. According to these values, water and wastewater infrastructure represent 48% of a municipality's total asset value, while roads represent only 30%.



The safety and quality of services provided by municipal water utilities depend on sound water and wastewater infrastructure. According to the 2016 Canadian Infrastructure Report Card, 12% of the linear and non-linear water assets and 11% of the linear and non-linear wastewater assets in Canada are in poor or very poor condition, representing \$51 billion in asset replacement value [1]. Additionally, more than two decades of underinvestment in infrastructure (1976-2000) [2] has resulted in depleted conditions and increased water and wastewater systems' average age.

This infrastructure deficit is in part the result of this buried, out of sight, and often forgotten aging and deteriorating linear water and wastewater pipeline having reached and/or passed their design and performance life of 50 to 75 years with little to no maintenance, repair, renovation or replacement. This failing infrastructure is analogous of driving a 50-year-old car with little maintenance and repair and expecting it to perform as a new car. Failure to address this water infrastructure backlog will lead to an exponential increase in operation costs and reduced Levels of Service, threatening public health, environment, and economic prosperity of Canada.

Climate change is also increasing the intensity of weather events, resulting in more urban flooding and other extreme events [3]. Water utilities must adapt to this new scenario to safeguard not only the physical assets but also the systems' ability to provide services. Additional capital investments and effective asset repair and maintenance are some of the actions that strengthen water infrastructure resilience to climate change impacts.

Since municipalities own almost 57% of core public infrastructure in Canada [1], they are responsible for funding capital investments, which are key to keep existing physical assets in an adequate condition and operating efficiently. Investing in buried infrastructure is particularly challenging due to the inherited difficulty in performing condition assessment to set priorities and support decision-making. Breaks, spills, and clogging are some of the more severe consequences of poorly managed pipelines, which force utility managers to prioritize operational costs over long-term capital investments.

Infrastructure Asset Management (IAM) is a framework based on the ISO 55000 series [4] [5] [6] that encourages municipalities to take into account long-term analysis in everyday decisions. This framework considers a life-cycle approach to establish assets characteristics, replacement value, current condition, and operational performance, to subsequently define the costs and timeframe for asset maintenance, renewal or replacement, while providing the desired level of service.

In parallel, PSAB 3150 is the Federal Regulation that provoked a seminal change in Canada: from 2009 on, municipalities' financial statements had to include tangible capital assets. Later, in 2014, the province linked the approval for the Federal Gas Tax Fund to the development and implementation of Asset Management Plans for core infrastructure assets [7]. As a result, currently over 95% of Ontario municipalities have an Asset Management Plan [8]. More recently, the Province of Ontario developed the Ontario Regulation 588/17, tackling Asset Management Policy, climate change and Levels of Service. In conclusion, regulations are the catalysis that drive change.

Canadian municipalities have understood how asset management can positively impact organizations and are strongly adopting this practice. However, the existence of a municipal Asset Management Plan does not guarantee reliable infrastructure asset management. For assets to be properly managed, water utilities must have processes in place to base decisions on technical and financial accurate information, that consider assets' life-cycle and Levels of Service. As a consequence, understanding municipalities asset management practices entails understanding their asset management processes.

Furthermore, municipal water utilities' approaches to asset management might diverge due to population size, system configuration (disperse vs. concentrated), geography, network profile (material, age, diameter, etc.) and business processes and strategies. With asset management being a growing priority in Canada and particularly in Ontario, several communities of practice developed readiness or maturity assessment tools as an attempt to determine the organization's asset management levels of practice [9] [10] [11].

Nonetheless, these tools often require the engagement of a team of professionals answering usually more than 100 detailed questions, which can be extremely time consuming and expensive. Additionally, even when municipalities choose to perform a readiness assessment, the results typically stay in the organization and are not shared with the industry. Consequently, there is a limited number of studies available concerning municipalities' asset management practices [12] [13] [14] [15]. These studies are mainly developed by communities of practice to fill a specific gap, being either very broad and not focusing on water utilities or geared towards answering a particular question.

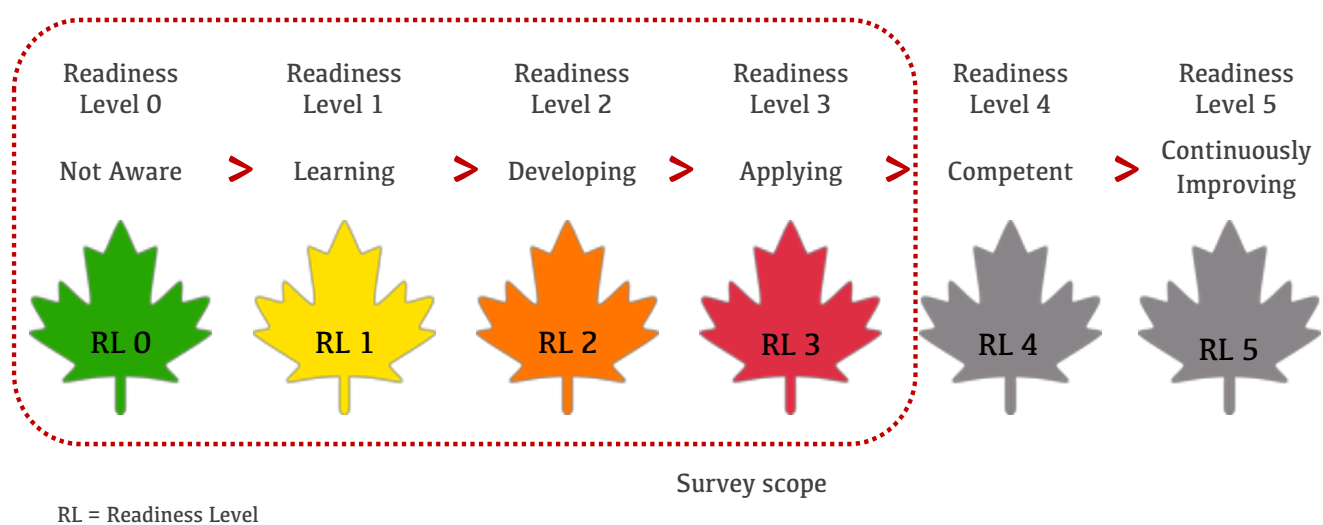
Regardless, new asset management regulations and guidelines are constantly being released in Canada and especially in Ontario, with limited information on how municipalities are actually implementing the asset management framework. One example is the ON Reg. 588/17, that requires municipalities to prepare an Asset Management Policy by July 2019, and expand on Asset Management Plans' requirements from the Ministry of Infrastructure's Building Together by adding information on current and proposed assets' Levels of Service by 2021 and 2024 respectively [16].

Methodology

This study focuses on the processes and practices used by Ontario municipalities to manage water and wastewater assets. The data presented in this report were collected through a voluntary web-based survey containing 54 questions (Appendix III). The Federation of Canadian Municipalities’ (FCM) Asset Management Readiness Scale [9], the ISO 55000 series [4] [5] [6], and the Ontario Regulation 588/17 [16] were adapted and used as a framework for this project. Several asset management professionals provided input on the pilot phase, which was crucial to keeping a straightforward and consistent survey.

In addition to the background questions, the survey is divided into six parts: (1) strategic vision and Asset Management Plan; (2) policy and governance; (3) people and leadership; (4) data and information; (5) planning and decision-making; and (6) contribution to asset management practice. Twenty-seven (27) out of the fifty-four (54) questions have the purpose of placing the municipalities in an asset management readiness scale. The remaining questions are important to check compliance with ON Reg. 588/17, to collect additional asset management information, and to confirm respondents background.

The FCM methodology classifies municipalities into six readiness levels based on implemented practices in each of the five competency areas: (1) policy and governance; (2) people and leadership; (3) data and information; (4) planning and decision-making; and (5) contribution to asset management practice. For this project, questions to place municipalities in the first four readiness levels were developed. For readiness level descriptions please see Appendix I.



Each alternative for a scorable question in the survey represents a specific readiness level in FCM's methodology. The option "working on level 1" from FCM's methodology, which is the lowest on the readiness scale, corresponds to the "readiness level 0 – RL 0" in this study and is worth 0 points, along with the "I am not sure" alternative. The option associated with the "readiness level 1 – RL 1" is worth 1 point, with the RL 2, 2 points, and 3 points for RL 3. The final readiness level reached by a municipality in a specific category corresponds to the lowest score among the questions of that category.

The average competency score gives an indication of how advanced a municipality is in adopting asset management practices. The maximum score is 3 points. Consequently, results will consider both the readiness level classification and the average score to provide a snapshot of water utilities' asset management practices.

The Water and Wastewater Asset Management Readiness survey was distributed using two methods: an e-mail list and a survey link in websites, twitter, and LinkedIn of communities of practice. The e-mail list contained 138 municipality contacts, was produced by the researchers, and did not target any particular Ontario region. The following organizations helped promoting the survey: Canadian Network of Asset Managers (CNAM), Canadian Water and Wastewater Association (CWWA), Canadian Water Network (CWN), Centre for Advancement of Trenchless Technologies (CATT), Ontario Water Works Association (OWWA), Southern Ontario Water Consortium (SOWC), and Water Canada. Additionally, a benchmark report comparing the respondent readiness level with the aggregated level of municipalities in the same size category was offered as an incentive to boost survey responses.

The timeframe for response collection was determined by the survey goal of a minimum of 30 responses combined with a population representation of at least 50% of the Ontario population. These goals were aligned with respondent representativeness of other asset management surveys used as benchmark for this project [1] [14] [15].

Finally, the results generated by this methodology represent a relative measure of municipalities adoption of asset management practices and processes in the water industry. Its greatest strength is to provide a snapshot of readiness levels that is comparable between municipalities of different backgrounds and in time.

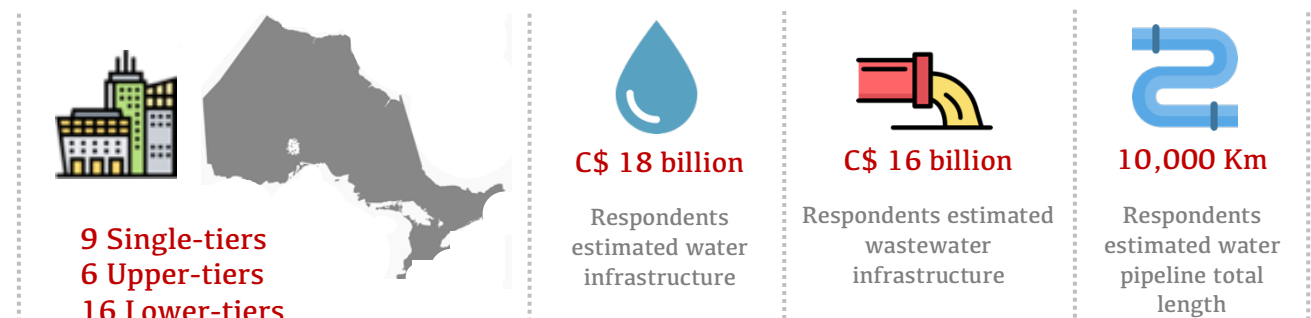
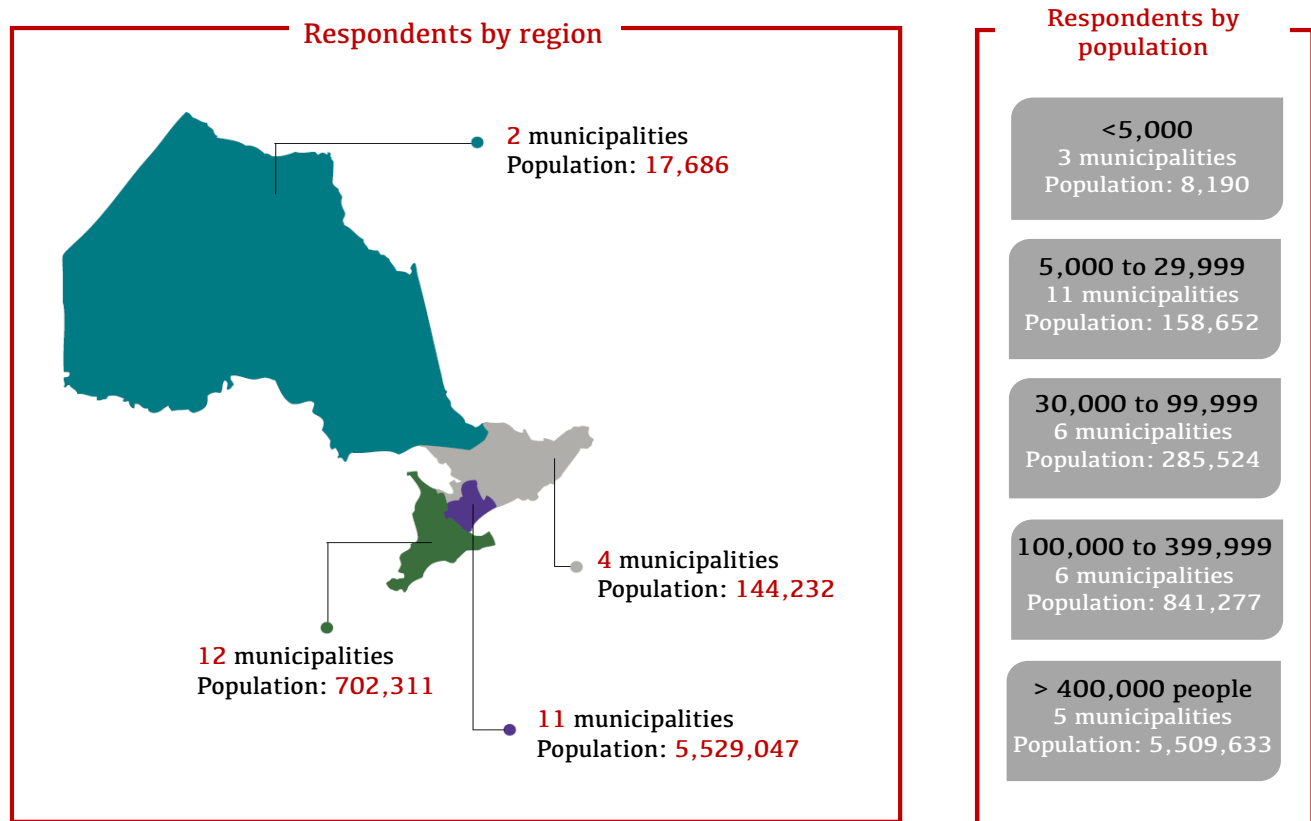


01

Background

1. Background

There are 444 municipalities in Ontario, and they own 665 drinking water systems and 466 wastewater systems [17]. As a consequence, the number of survey responses and the diversity in terms of municipalities' size, region and tier position are key for the survey success. Survey respondents consisted of 31 municipalities representing 50.6% of the Province's total population (6,803,276 out of 13,448,494) according to the 2016 Census [18].





02

Survey Results

2. Survey Results

This section presents the results of the 2018 Water and Wastewater Asset Management Readiness survey. First, an overview of the readiness level data is shown in Section 2.1. Then, readiness values are displayed according to the five competency areas. Finally, results from the questions regarding the ON Reg. 588/17, funding gaps and other items are showcased.

Data is presented exclusively in aggregated form and, when pertinent, divided into three categories according to municipality's size: small (up to 29,999 people), medium (from 30,000 to 99,999 people) and large (over 100,000 people).

2.1. Overview of Readiness Level Results

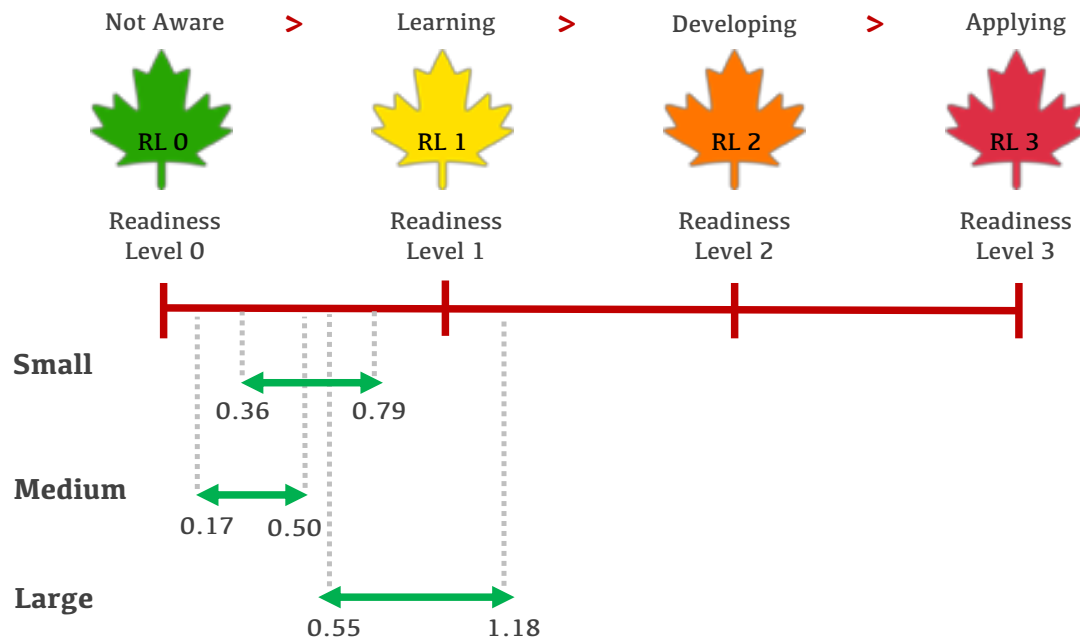
Survey results for all five competency categories according to municipalities' size are summarized below. The readiness level values represent the average readiness level of all municipalities in the same category, while the scores characterize the average points obtained by the municipalities per category. Results for each category are discussed in the following sections of this report.

Readiness Assessment	Small			Medium			Large		
	RL	Score	Stand. Dev.	RL	Score	Stand. Dev.	RL	Score	Stand. Dev.
Policy and Governance	0.36	1.08	0.70	0.17	0.97	0.43	1	1.58	1.04
People and Leadership	0.79	1.59	0.80	0.5	1.53	0.73	1.18	1.76	1.05
Data and Information	0.43	1.39	0.80	0.33	1.47	0.71	0.82	1.91	0.48
Planning and Decision-making	0.43	1.55	0.69	0.17	1.43	0.52	0.55	1.97	0.58
Contribution to Asset Management Practice	0.46	1	0.79	0.33	0.75	0.63	0.55	1.52	0.90

RL = Readiness Level

To reach a specific readiness level, all outcomes for that level must be fulfilled. According to FCM, lower readiness levels do not necessarily mean assets are not being managed, though they suggest that work should be done in respect to formalizing and standardizing practices. Municipalities might want to evaluate the level they want to reach to meet their community needs [9].

Where we are:



Survey data shows that Small and Medium water utilities are moving towards Readiness Level 1 – LEARNING, while some Large water utilities have achieved Readiness Level 1 and are moving towards Readiness Level 2 – DEVELOPING. It should be noted that in accordance with FCM Readiness Levels – six in total - Ontario water utilities are just starting the asset management journey.

The following sections of this report present an overview of key survey findings regarding Asset Management practices implemented by most municipalities in a given category. It should be noted that there may be situations where to reach the next readiness level, more municipalities should implement the processes that were here described. Practice implementation is not uniform among municipalities and descriptions represent a relative trend.

Small municipalities

- **Policy and governance (RL=0.36, score=1.08):** the connection between asset management and the organization's strategy is not sufficiently clear. Municipalities are planning to establish a process to monitor the Asset Management Plan implementation. Asset management objectives are not well documented or communicated. Most municipalities have an Asset Management Policy. Actions to achieve

the asset management objectives are not yet defined. Municipalities have not established an Asset Management System.

- **People and leadership (RL=0.79, score=1.59):** municipalities have established asset management teams, but they are usually not cross-functional. Not all roles and responsibilities regarding leadership for implementation, operation, monitoring and improvement of asset management are defined. Council demonstrates buy-in and support for asset management. There were sufficient financial resources last year allocated to the development of the Asset Management Planned actions, but these actions only comprised priority improvements to the asset management system.

- **Data and information (RL=0.43, score=1.39):** the Asset Management Plan states the Levels of Service. Municipalities work with adequate asset data information. Current asset condition assessment practices help with asset investment prioritization and improved decision-making. Asset data analysis helps to determine asset condition and prioritization. Financial data is mostly used to set capital and operational expenditures.

- **Planning and decision-making (RL=0.43, score=1.55):** asset management decisions are increasingly being based on the Asset Management Plan, which considers a timeframe of 20 years or more. Municipalities still need to establish a process to update the plan. GIS or other software that aggregates data is the main source of information for Asset Management Planning and decision-making. Investment decisions are prioritized based on experience, council and management input, and available information. There is a process in place to identify funding gaps.

- **Contribution to asset management practice (RL=0.46, score=1.00):** employees' asset management development requirements are generally based on short-term needs. Most municipalities provided asset management guidance through in-house meetings or workshops. They are mitigating the risk of losing information through improved record keeping and knowledge sharing resources. Most of municipalities attend at least one asset management event per year.

Medium-sized municipalities

- **Policy and governance (RL=0.17, score=0.97):** there is a clear connection between the organization's strategy and goals with asset management, but resource allocation is not defined. Municipalities are planning to establish a process to monitor the Asset Management Plan implementation. Asset management objectives are not defined. The Asset Management Policy is either not developed or

not well communicated within the organization. Actions to achieve the asset management objectives are not well communicated. Most municipalities are planning to establish an Asset Management System.

- **People and leadership (RL=0.50, score=1.53):** the organization has established an asset management team, but it is not cross-functional. There are people responsible for asset management, but roles and responsibilities are not defined. Council demonstrates buy-in and support for asset management. There were sufficient financial resources last year allocated to the development of the Asset Management Planned actions, but these actions only comprised priority improvements to the asset management system.

- **Data and information (RL=0.33, score=1.47):** municipalities are planning to add assets' Levels of Service to their Asset Management Plans. They work with basic asset data information. Current asset condition assessment practices help with asset investment prioritization and improved decision-making. Asset data analysis helps to determine asset condition and prioritization. Financial data is mostly used to set capital and operational expenditures.

- **Planning and decision-making (RL=0.17, score=1.43):** the Asset Management Plan is not frequently taken in consideration in the decision-making process. The plan considers a timeframe of 10 years or more. Municipalities need to establish a process to update the plan. GIS or other software that aggregates data is the main source of information for Asset Management Planning and decision-making. Investment decisions prioritization address short-term needs, with teams setting priorities independently. Most of municipalities seem to have a process in place to identify funding gaps.

- **Contribution to asset management practice (RL=0.33, score=0.75):** municipalities have just started to take a more active role in employees' asset management development. Most of them do not provide any asset management guidance. Municipalities are mitigating the risk of losing information through improved record keeping. Municipalities attend at least one asset management event per year.

Large municipalities

- **Policy and governance (RL=1.00, score=1.58):** for most municipalities there is a clear connection between the organization's strategy and goals with asset management, but resource allocation is not defined. They are planning to establish a process to monitor the Asset Management Plan implementation. Asset management objectives are well documented, communicated and consistent with the organization's objectives. Most municipalities have an Asset Management Policy. Actions to achieve the asset management objectives are defined and well communicated within the organization.

Municipalities are starting to implement the elements and processes required to an Asset Management System.

- **People and leadership (RL=1.18, score=1.76):** most of the asset management teams are cross-functional teams. There is an accountable asset management team, but not all roles and responsibilities regarding leadership for implementation, operation, monitoring and improvement of asset management are defined. Council demonstrates buy-in and support for asset management. There were sufficient financial resources last year allocated to the development of the Asset Management Planned actions, but these actions only comprised priority improvements to the asset management system.


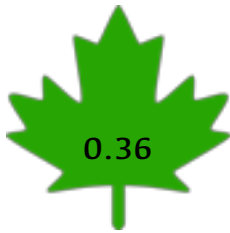



- **Data and information (RL=0.82, score=1.91):** the Asset Management Plan states municipalities' Levels of Service. The organization works mostly with basic asset data information. Existing asset condition assessment practices help with asset investment prioritization and improved decision-making. Asset data analysis helps to determine asset condition and prioritization. Financial data is mostly used for yearly PSAB-3150 reporting requirements and to set capital and operational expenditures.

- **Planning and decision-making (RL=0.55, score=1.97):** asset management decisions are increasingly being based on the Asset Management Plan, which considers a timeframe of 20 years or more. Municipalities already have a process in place for plan update. These municipalities are halfway through adopting Asset Management Plans as the main source of information for planning and decision-making. Investment decisions prioritization are gradually considering asset investment plans. There is a process in place to identify funding gaps.

- **Contribution to asset management practice (RL=0.55, score=1.52):** the organization encourages employees' asset management development by selecting and training internal experts to support the development of organizational capacity. Despite the trainings that have been offered, most municipalities had a "hit the ground running" approach towards asset management guidance, mentoring or competence evaluation. They are mitigating the risk of losing information through improved record keeping and knowledge sharing resources. Municipalities attend at least one event per year and are embracing knowledge sharing opportunities.

2.2. Policy and Governance

“This competency involves putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and roadmap, and then measuring progress and monitoring implementation over time.” (FCM's Asset Management Readiness Scale)

	Small	Medium	Large
 Readiness Level	 0.36	 0.17	 1.00
 Score	1.08	0.97	1.58

Key Findings

57% of small, 50% of medium and 55% of large municipalities do not have a process to **monitor asset management plan implementation**.

For 43% of small municipalities, **asset management objectives** are not well documented or communicated. 50% of medium municipalities **do not have asset management objectives**.

55% of large municipalities report that their **asset management objectives are well documented**, communicated and consistent with the organization's objectives.

Asset management systems are not established for 50% of small, 100% of medium and 36% of large municipalities.

Results Overview:

Small municipalities

- **Asset Management Plan implementation (Question 17):** though 57% of the responding municipalities currently do not have a process to monitor plan implementation, 88% of these municipalities are planning to establish one. 21% already have a process to monitor plan implementation.
- **Asset management objectives (Question 18):** 22% of participants do not have any asset management objectives. For 43%, objectives have been defined but are not well documented or communicated. 28% of respondents have well documented and communicated objectives, consistent with the organization's objectives.
- **Asset management policy (Question 19):** 29% of respondents do not have an Asset Management Policy, while for 14% the policy exists but it is not well communicated. 43% of municipalities have a policy that is well communicated within the organization.
- **Roadmap or the actions to achieve asset management objectives (Question 20):** 29% of the respondent municipalities have not defined any actions. For 22% of participants, actions have been defined but are not well communicated. 28% report that actions are well communicated throughout the organization.
- **Asset Management System (Question 21):** half of the respondents do not have a system in place, but 57% of these same respondents are planning to implement one. 29% of municipalities have set up the elements and processes required for an asset management system.

Medium-sized municipalities

- **Asset Management Plan implementation (Question 17):** 50% of participants do not have a process to monitor plan implementation but are planning to establish one. 33% already have a process in place.
- **Asset management objectives (Question 18):** 50% of municipalities do not have defined asset management objectives. For 17%, objectives have been defined but are not well documented or

communicated. 33% of municipalities report well documented and communicated objectives, that are consistent with the organization's objectives.

- **Asset Management Policy (Question 19):** 33% of the respondent municipalities do not have an Asset Management Policy, while for 50% the policy is not well communicated.

- **Roadmap or the actions to achieve asset management objectives (Question 20):** no actions have been defined for 20% of participants, whereas for 60% actions have been defined but are not well communicated throughout the organization. Additionally, 20% of participants report that the actions are well communicated and provide a framework for asset management objectives.

- **Asset Management System (Question 21):** while none of the respondents have an asset management system in place, 67% are planning to establish one.

Large municipalities

- **Asset Management Plan implementation (Question 17):** 45% of municipalities have a process in place to monitor plan implementation, while 55% do not have one. 37% of municipalities that do not monitor plan implementation are planning to establish a process for that.

- **Asset management objectives (Question 18):** 55% of the participants have defined asset management objectives. 18% still do not have defined objectives.

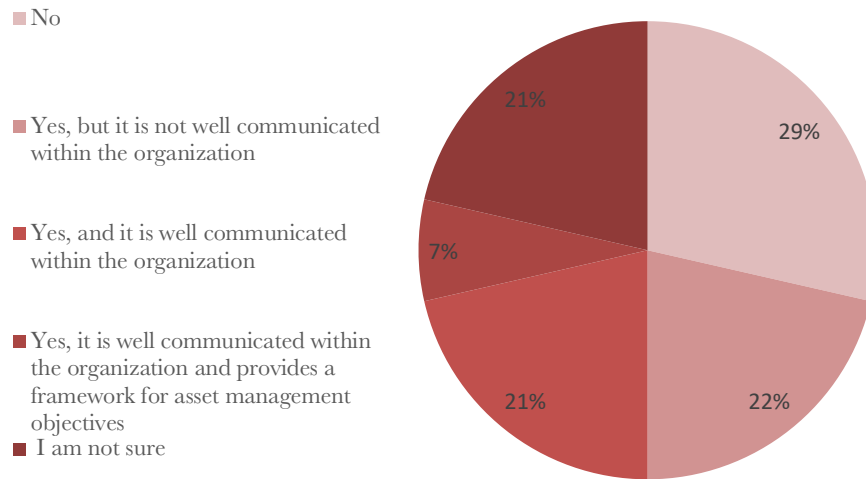
- **Asset Management Policy (Question 19):** 28% of the respondent municipalities do not have a policy. For 27%, the Asset Management Policy is not well communicated. The Asset Management Policy is well communicated for 36% of the respondents.

- **Roadmap or the actions to achieve asset management objectives (Question 20):** while 27% of municipalities have not yet defined the actions, for 46% of them action are well communicated within the organization and provide a framework for objectives.

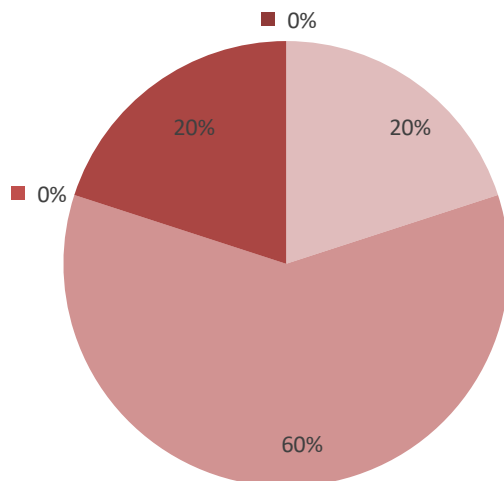
- **Asset Management System (Question 21):** only 18% of respondents have a system established and are measuring and monitoring its progress over time. 36% have no system and 28% of respondents have set up the required elements and processes for an Asset Management System.

Highlight: Did your organization define the necessary actions to achieve its asset management objectives? (Question 20)

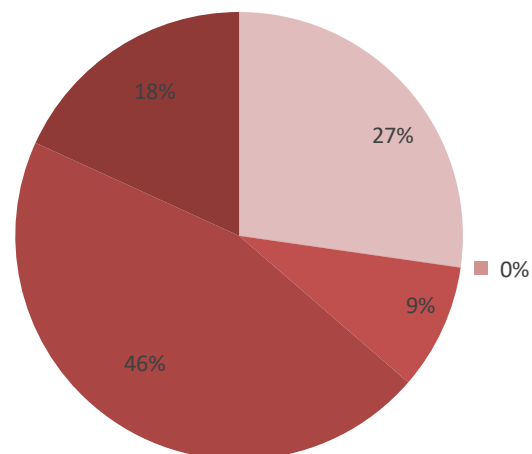
Small



Medium








Large



Defining asset management objectives and then the necessary actions to reach those objectives are vital steps for continuously improving the asset management system. This is especially true for small municipalities, that have limited human and financial resources available. Concentrating efforts on specific asset management objectives could save time and money for these organizations.

2.3. People and Leadership

“This competency involves setting up cross-functional teams with clear accountability and ensuring adequate resourcing and commitment from senior management and elected officials to advance asset management.” (FCM's Asset Management Readiness Scale)

	Small	Medium	Large
 Readiness Level	 0.79	 0.50	 1.18
 Score	1.59	1.53	1.76

Key Findings

28% of small, 50% of medium and 27% of large municipalities do not have an **asset management team**, whereas for 43%, 33% and 55% respectively, the **team has been in place for more than two years**.

Not all **asset management leadership roles and responsibilities** are clearly defined for 72% of small, 50% of medium and 55% of large municipalities.

57% of small, 50% of medium and 64% of large municipalities report that **council supports asset management practices** and understands its requirements.

Allocated **financial resources were not sufficient** to develop last year's asset management planned actions for 14% of small, 50% of medium and 9% of large municipalities.

Results Overview:

Small municipalities

- **Cross-functional asset management team (Questions 3 and 23):** 43% of municipalities indicate that the asset management team has been in place for more than two years, while 28% do not have one. For 43% of respondents, teams are cross-functional, i.e. they comprise human resources from different departments.
- **Leadership roles and responsibilities (Question 22):** 29% of municipalities report having people responsible for asset management, but roles and responsibilities are not defined. There is an accountable asset management team, but not all roles and responsibilities are defined for 43% of municipalities.
- **Council's support and commitment (Question 24):** for 57% of participants, council demonstrates buy-in and support for asset management. Council supports asset management practices but is not aware of its requirements is the chosen option for 29% of respondents.
- **Financial resources for Asset Management Planned actions (Question 25):** 29% of the respondents that have chosen to answer this question report that there were sufficient financial resources to support last year's Asset Management Planned actions, whereas 28% indicate that the resources were sufficient, but the planned actions only comprised priority improvements to the asset management system.

Medium-sized municipalities

- **Cross-functional asset management team (Questions 3 and 23):** 50% of municipalities do not have an asset management team, but 33% of them are planning to establish one. 50% have asset management teams. For 50% of the organizations, teams are not cross-functional, while for 33% they are.
- **Leadership roles and responsibilities (Question 22):** 50% of the respondent municipalities report having no defined leadership roles and responsibilities. 33% indicate that there are people responsible for asset management, but roles and responsibilities have not been defined.

- **Council's support and commitment (Question 24):** for 33% of participants, council supports asset management practices but is not aware of its requirements, while 33% indicate that council demonstrates buy-in and support for asset management.

- **Financial resources for Asset Management Planned actions (Question 25):** there were sufficient financial resources last year to support the Asset Management Planned actions for 33% of the respondent municipalities. Conversely, the allocated financial resources were not sufficient for 50% of respondents.

Large municipalities

- **Cross-functional asset management team (Questions 3 and 23):** while 27% of municipalities do not have an asset management team, the team has been in place for more than two years in 55% of the cases, and less than 2 years in 18%. Cross-functional teams are reported by 64% of respondents.

- **Leadership roles and responsibilities (Question 22):** 46% of participant's report that there is an accountable asset management team, but not all roles and responsibilities are defined. For 27%, there is an asset management team and their roles and responsibilities are clearly defined.

- **Council's support and commitment (Question 24):** for 64% of respondent municipalities, council demonstrates buy-in and support for asset management.

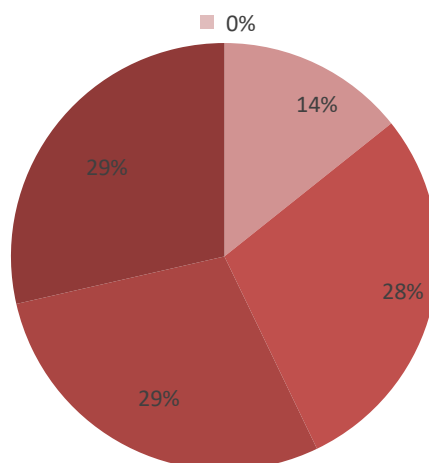
- **Financial resources for Asset Management Planned actions (Question 25):** 37% of participants are not sure about this question, as in large municipalities budget information is usually concentrated in key people. For 27% of participants, last year's resources were sufficient, but the planned actions only comprised priority improvements to the asset management system. Similarly, 27% indicate that there were sufficient financial resources to support the planned actions.



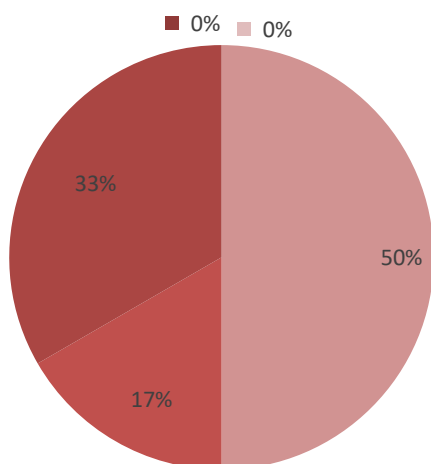
Highlight: Did your organization allocate sufficient financial resources last year to develop the Asset Management Planned actions? (Question 25)

Small

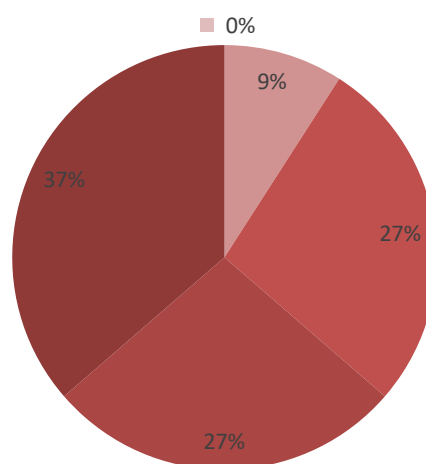
- No, asset management financial resources were not approved by council
- No, the allocated financial resources were not sufficient to develop the planned actions
- Yes, but the planned actions only comprised priority improvements to the asset management system
- Yes, there were sufficient financial resources to support the asset management planned actions
- I am not sure



Medium






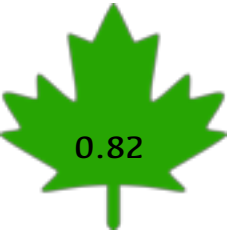

Large



Ensuring the budget for asset management actions is a vital aspect of all programs. Large municipalities have greater capacity concerning asset management resources. These organizations usually have a more robust budget and a defined structure for human resources, where at least some of the staff is dedicated to asset management programs. Conversely, small municipalities have their staff juggling a wide variety of responsibilities, particularly if the municipality is under 5,000 people. In this case, it is common to have one employee wearing several hats within the organization.

2.4. Data and Information

“This competency involves using asset data, performance data and financial data to support effective asset management planning and decision-making.” (FCM's Asset Management Readiness Scale)

	Small	Medium	Large
 Readiness Level	 0.43	 0.33	 0.82
 Score	1.39	1.47	1.91

Key Findings

Assets' **Levels of Service (LoS)** are not specified in the Asset Management Plans of **31%** of small, **50%** of medium and **18%** of large municipalities.

Asset investment prioritization and improved decision-making is the main benefit derived from current asset condition assessment practices for **65%** of small, **67%** of medium and **64%** of large municipalities.

Analysis of asset data is mostly used to **determine asset condition and prioritization** (**54%** of small, **50%** of medium and **18%** of large municipalities) and rarely used to determine **current and future levels of service**.

For **84%** of respondents the most common **tool to manage asset data** is **GIS**, while **68%** of respondents use **Excel**.

Results Overview:

Small municipalities

- **Asset's Level of Service – LoS (Question 15):** the Asset Management Plan specifies asset's Levels of Service for 54% of the respondent municipalities. LoS are not specified in the plans for 31% of respondents.
- **Asset data inventory (Question 26):** the municipalities work mostly with basic (29%) and adequate (43%) asset inventory data.
- **Asset condition assessment practices (Question 29):** for 65% of respondents the main benefit of current asset condition assessment practices is asset investment prioritization and improved decision-making. 14% of municipalities have not established a process for condition assessment.
- **Asset data analysis (Question 30):** data analysis helps to determine asset condition and prioritization for 54% of participants. 31% report that the organization works with limited asset data information and analysis, mostly used for operation and maintenance.

Medium-sized municipalities

- **Asset's Level of Service – LoS (Question 15):** 50% of respondents are planning to add LoS to their Asset Management Plans, whereas for 50% Levels of Service are already specified in the plan.
- **Asset data inventory (Question 26):** the municipalities work with basic (67%), adequate (16%), and comprehensive (17%) asset inventory data.
- **Asset condition assessment practices (Question 29):** 16% of the participants have not established a process for condition assessment. The main benefit of current asset condition assessment practices is asset investment prioritization and improved decision-making, according to 67% of participants.
- **Asset data analysis (Question 30):** 50% of municipalities work with limited asset data information and analysis, mostly used for operation and maintenance. The other 50% indicate that data analysis helps to determine asset condition and prioritization.

Large municipalities

- **Assets' Level of Service – LoS (Question 15):** 73% of respondents report that assets' LoS are specified on their Asset Management Plans. Assets' LoS are not specified for 18% of participants.
- **Asset data inventory (Question 26):** the municipalities work mostly with basic (46%) and adequate (36%) asset inventory data.
- **Asset condition assessment practices (Question 29):** asset investment prioritization and improved decision-making is the main benefit of current asset condition assessment practices according to 64% of the respondent municipalities. 18% have not yet established a process for condition assessment.
- **Asset data analysis (Question 30):** for 64% of participants, data analysis helps to determine asset condition and prioritization, whereas for 27% data analysis combines different data inputs to determine proposed Levels of Service.



Highlight: Does your organization have asset data inventory? (Question 26)

Limited: some attributes (e.g. ID, age) for key assets.

Basic: some attributes for all assets.

Adequate: sufficient attributes for all assets.

Comprehensive: sufficient attributes for all assets linked to performance information (e.g. number of breaks).

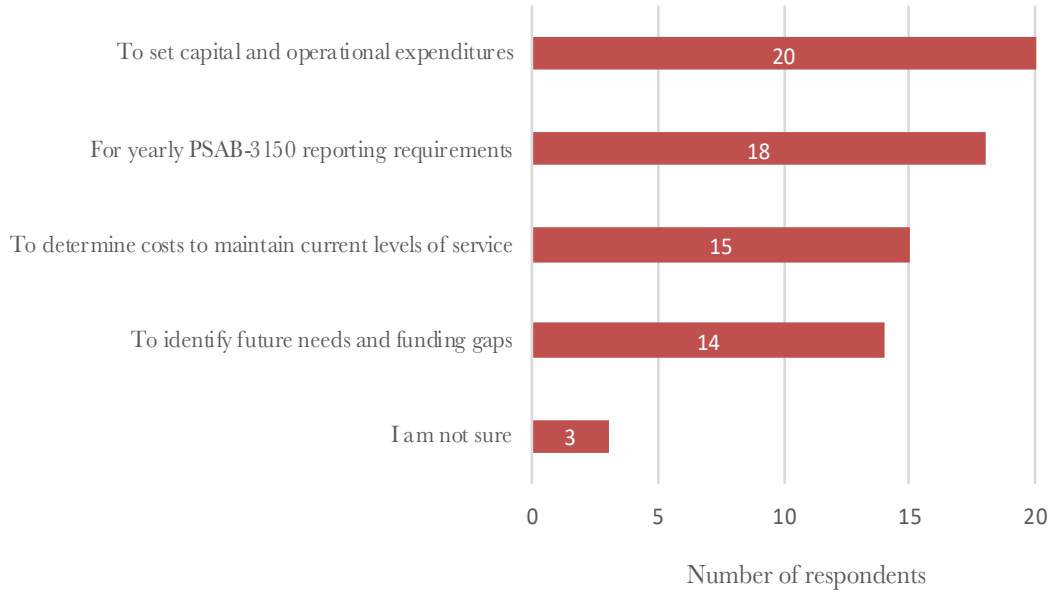
	Small	Medium	Large
Limited	0%	0%	0%
Basic	29%	67%	46%
Adequate	43%	16%	36%
Comprehensive	14%	17%	18%

*14% of small municipalities' respondents answered "I am not sure"

Small municipalities seem to be convinced that asset data inventory is key to provide cost-efficient water related services. Admittedly, they have shorter pipe networks and smaller water and wastewater treatment plants and pumping stations, but they also have limited budgets and availability of human resources. Medium-sized municipalities appear to be having difficulty improving their asset data inventory, while it looks like large municipalities are moving towards adequate data inventory.

Asset data is most developed when compared with performance and financial data, as it is the main information a water utility needs for running its business. However, performance and financial data are fundamental for determining current Levels of Service and identifying proposed Levels of Service and funding gaps.






How is financial data used in your organization? (Question 31)



This question is a “mark all that apply” question and for most respondents, financial data is used to set capital and operational expenditures. Almost half of the respondent’s report using financial data to set current Levels of Service and to identify funding gaps. The expectation is that as asset management readiness capacity increases, financial data will progressively be used to set Levels of Service and identify funding gaps.

2.5. Planning and Decision-making

“This competency involves documenting and standardizing how the organization sets asset management priorities, conducts capital and operations and maintenance (O&M) planning, and decides on budgets.” (FCM's Asset Management Readiness Scale)

	Small	Medium	Large
 Readiness Level	 0.43	 0.17	 0.55
 Score	1.55	1.43	1.97

Key Findings

14% of small and 16% of medium municipalities still **do not have an asset management plan**.

The **asset timeframe considered in the asset management plan** is of 20 years or more for **57%** of small, **33%** of medium and **55%** of large municipalities.

28% of small, **33%** of medium and **9%** of large municipalities do not have a process in place to **identify funding gaps**.

The asset management plan is the main **source of information for planning and decision-making** for **36%** of small, **17%** of medium and **45%** of large municipalities.

Results Overview:

Small municipalities

- **Asset Management Plan (Questions 8 and 14):** 14% of municipalities do not have an Asset Management Plan. For those that have an Asset Management Plan, 22% do not use the plan in the decision-making process, 50% use it sometimes while 14% have the plan fully integrated in the decision-making process. The Asset Management Plan timeframe is of 20 years or more for 57% of municipalities.
- **Source of information for planning and decision-making (Question 32):** 21% of the respondent's report that there is no tool or source of information in place to manage assets. The main source of information is GIS or other software that aggregates data for 43% of respondents and the Asset Management Plan for 36% of respondents.
- **Investment prioritization decisions (Question 34):** only 36% of participants indicate that investment prioritization decisions are based on the asset investment plan.
- **Identification of funding gaps (Question 35):** 28% of the respondents do not have a process to identify funding gaps. 65% have a process, from which: short-term financial planning is based on current Levels of Service (36%) and long-term financial planning is associated with asset lifecycle and Levels of Service (29%).

Medium-sized municipalities

- **Asset Management Plan (Questions 8 and 14):** 16% of municipalities do not have an Asset Management Plan. For those that have an Asset Management Plan, 50% do not use the plan in the decision-making process, 17% use it sometimes while 17% have the plan fully integrated in the decision-making process. The Asset Management Plan timeframe is of 20 years or more for 33% of municipalities.
- **Source of information for planning and decision-making (Question 32):** 16% of the respondent municipalities report that there is no tool or source of information in place to manage assets. The main source of information is GIS or other software that aggregates data for 67% of respondents and the Asset Management Plan for 17% of respondents.

- **Investment prioritization decisions (Question 34):** For 83% of participants, prioritization usually addresses short-term needs, with teams setting priorities independently. Only 17% of participants indicate that decisions are based on the asset investment plan.
- **Identification of funding gaps (Question 35):** 33% of the respondents do not have a process to identify funding gaps. 50% have a process, from which: short-term financial planning is based on current Levels of Service (33%) and long-term financial planning is associated with asset lifecycle and Levels of Service (17%).

Large municipalities

- **Asset Management Plan (Questions 8 and 14):** 100% of large municipalities have an Asset Management Plan. 27% do not use the plan in the decision-making process, 27% use it sometimes while 37% have the plan fully integrated in the decision-making process. The Asset Management Plan timeframe is of 20 years or more for 55% of municipalities.
- **Source of information for planning and decision-making (Question 32):** the main source of information is GIS or other software that aggregates data for 46% of respondents and the Asset Management Plan for 45% of respondents.
- **Investment prioritization decisions (Question 34):** prioritization follows asset investment plans for 55% of municipalities and usually balance the current Levels of Service with longer-term goals and risks. 18% of prioritization decisions address short-term needs and for additional 18% priority evaluation is based on experience, council and management input, and available information
- **Identification of funding gaps (Question 35):** 9% of the respondents do not have a process to identify funding gaps. 73% have a process, from which: financial planning for capital investment is based on population growth (9%), short-term financial planning is based on current Levels of Service (27%) and long-term financial planning is associated with asset lifecycle and Levels of Service (37%).

Highlight: Does your organization have an Asset Management Plan? (Question 8)

	Small	Medium	Large
No asset management plan	14%	16%	0%
Yes, but the plan is not taken in consideration in the decision-making process	22%	50%	27%
Yes, and sometimes decisions are based on the plan	50%	17%	27%
Yes, and the plan is fully integrated with the organization's decision-making processes	14%	17%	37%

*9% of large municipalities' respondents answered "I am not sure"

The purpose of this question is to verify how Asset Management Plans are being used for municipalities' planning and decision-making processes. Three municipalities from a total of thirty-one do not have an Asset Management Plan, which is in line with data from the Association of Municipalities Ontario [8] that revealed that 95% of municipalities currently have an Asset Management Plan.

Attention should be given to the fact that for 22% of small, 50% of medium and 27% of large municipalities, the Asset Management Plan is not taken in consideration in the decision-making process. This could indicate that plans are not frequently updated, or asset prioritization follows only short-term needs.

The survey results indicate that Asset Management Plans are being progressively adopted by municipalities as the main source of information for planning and decision-making. The plan's development is an iterative process where each iteration brings the opportunity for improvement.

The development of an Asset Management Plan demands great effort from human resources, and just by bringing people together in the same room to discuss how assets should be managed is by itself a great achievement. The main takeaway here is to keep pushing for Asset Management Plan's continuous improvement.

Does your organization have a process in place to identify possible future funding gaps?

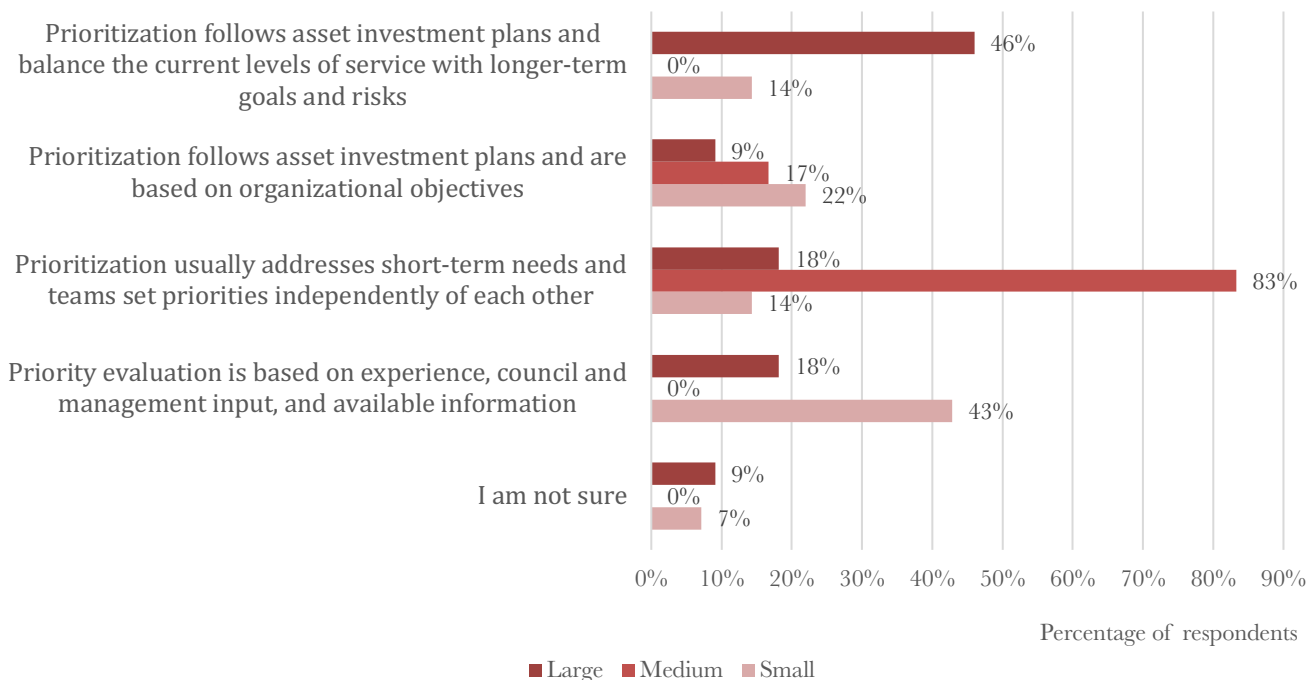
(Question 35)

	Small	Medium	Large
None, budgeting and capital investments are based on current needs.	28%	33%	9%
Yes, financial planning for capital investment is based on population growth.	0%	0%	9%
Yes, short-term (less than 5 years) financial planning for capital and operational expenditures is based on current levels of service	36%	33%	27%
Yes, long-term (more than 10 years) financial planning associated with asset lifecycle and levels of service	29%	17%	37%
I am not sure	7%	17%	18%

The ability of identifying funding gaps is one of the greatest advantages of the asset management framework. Therefore, having a process in place for this feature is of extreme importance.

How does your organization prioritize asset management investment decisions?




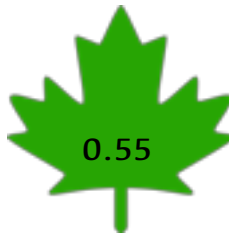

(Question 34)



Investments decisions should consider assets' lifecycle and not only short-term needs. Prioritization should be based on objective information and rooted on financial analysis and risk management.

2.6. Contribution to Asset Management Practice

“This competency involves asset management training, developing staff, sharing knowledge internally and participating in external knowledge sharing.” (FCM's Asset Management Readiness Scale)

	Small	Medium	Large
 Readiness Level	 0.46	 0.33	 0.55
 Score	1.00	0.75	1.52

Key Findings

At least some form of **internal asset management knowledge sharing** is being encouraged by **62%** of small, **67%** of medium and **82%** of large municipalities.

70% of small, **67%** of medium and **82%** of large municipalities attend at least **one asset management event** per year.

33% of small, **67%** of medium and **46%** of large municipalities had a "hit the ground running" approach regarding **asset management training, guidance/mentoring or competence evaluation**.

Employee's asset management development approach is informal and driven by the initiative of team members for **31%** of small, **50%** of medium and **9%** of large municipalities.

Results Overview:

Small municipalities

- **Employees' asset management development (Question 39):** the employee development approach is informal and largely driven by the initiative of team members (31% of municipalities); development requirements are based on short-term needs (31% of municipalities).
- **Asset management training, guidance/mentoring or competence evaluation (Question 40):** 33% of municipalities had a “hit the ground running approach” towards asset management training and guidance while 33% offered guidance through in-house asset management meetings or workshops.
- **Internal asset management knowledge sharing (Question 41):** 23% of respondents report that the organization is mitigating the risk of losing information through improved record keeping. 31% are structuring asset management knowledge sharing resources.
- **External asset management knowledge sharing (Question 42):** 39% of the respondent municipalities attend at least one asset management event per year. 23% also share their experience with peers, in addition to attending at least one event per year.

Medium-sized municipalities

- **Employees' asset management development (Question 39):** for 50% of municipalities, development approach is informal and largely driven by the initiative of team members. Development requirements are based on short-term needs for 33% of municipalities.
- **Asset management training, guidance/mentoring or competence evaluation (Question 40):** a “hit the ground running approach” approach is report by 67% of respondents while 33% indicate that the organization provided training by hiring specialized third parties or by sending human resources to external training sessions.
- **Internal asset management knowledge sharing (Question 41):** for 33% of participants' knowledge and information are concentrated in key people. 50% report that the organization is mitigating the risk of losing information through improved record keeping.

- **External asset management knowledge sharing (Question 42):** 50% of the respondent municipalities attend at least one asset management event per year.

Large municipalities

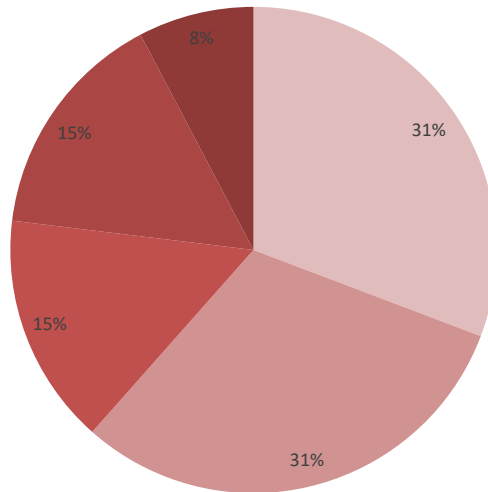
- **Employees' asset management development (Question 39):** 55% of participants indicate that internal experts are selected and trained to support the development of organizational capacity. Only in 9% of the cases development approach is informal and driven by the initiative of team members.
- **Asset management training, guidance/mentoring or competence evaluation (Question 40):** a “hit the ground running approach” approach is report by impressive 46% of respondents.
- **Internal asset management knowledge sharing (Question 41):** knowledge and information are concentrated in key people for 18% of municipalities and are freely shared for 36% of municipalities. 37% indicate that the organization is mitigating the risk of losing information through improved record keeping.
- **External asset management knowledge sharing (Question 42):** 37% of respondents attend at least one event per year, whereas 27% actively participate in asset management events and share their experience with peers.



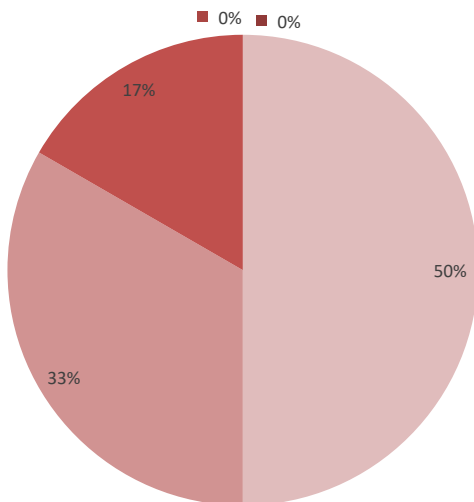
Highlight: Does your organization encourage employees' asset management development? (Question 39)

Small

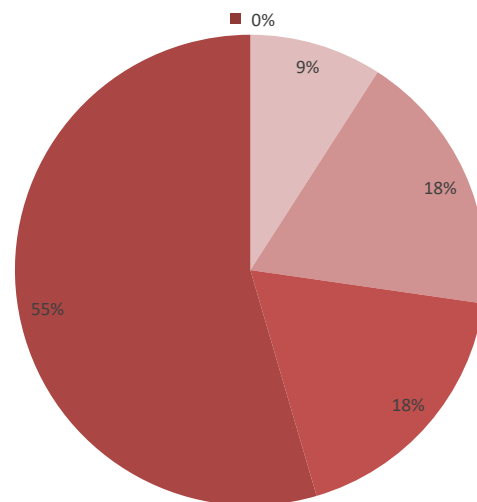
- No, asset management development approach is informal and largely driven by the initiative of team members
- Yes, but asset management development requirements are based on short-term needs (e.g. regulatory requirements)
- Yes, the organization promotes basic asset management awareness training to all employees
- Yes, the organization selects and trains internal experts to support the development of organizational capacity
- I am not sure



Medium



Large



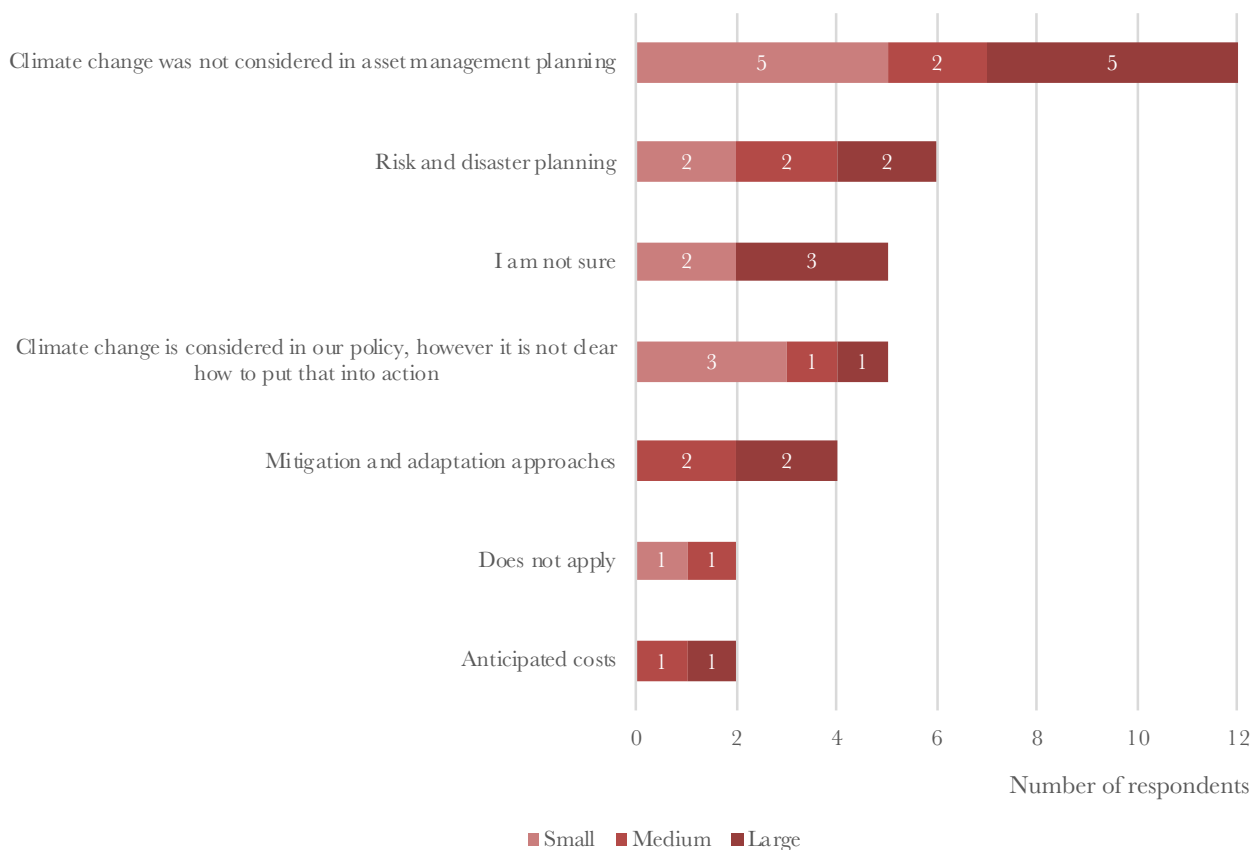
The employees' asset management development approach is intrinsically connected to budget availability. Unsurprisingly, large municipalities tend to be more comfortable economically to spare a piece of the budget for training and other development actions.

2.7. ON Regulation 588/17

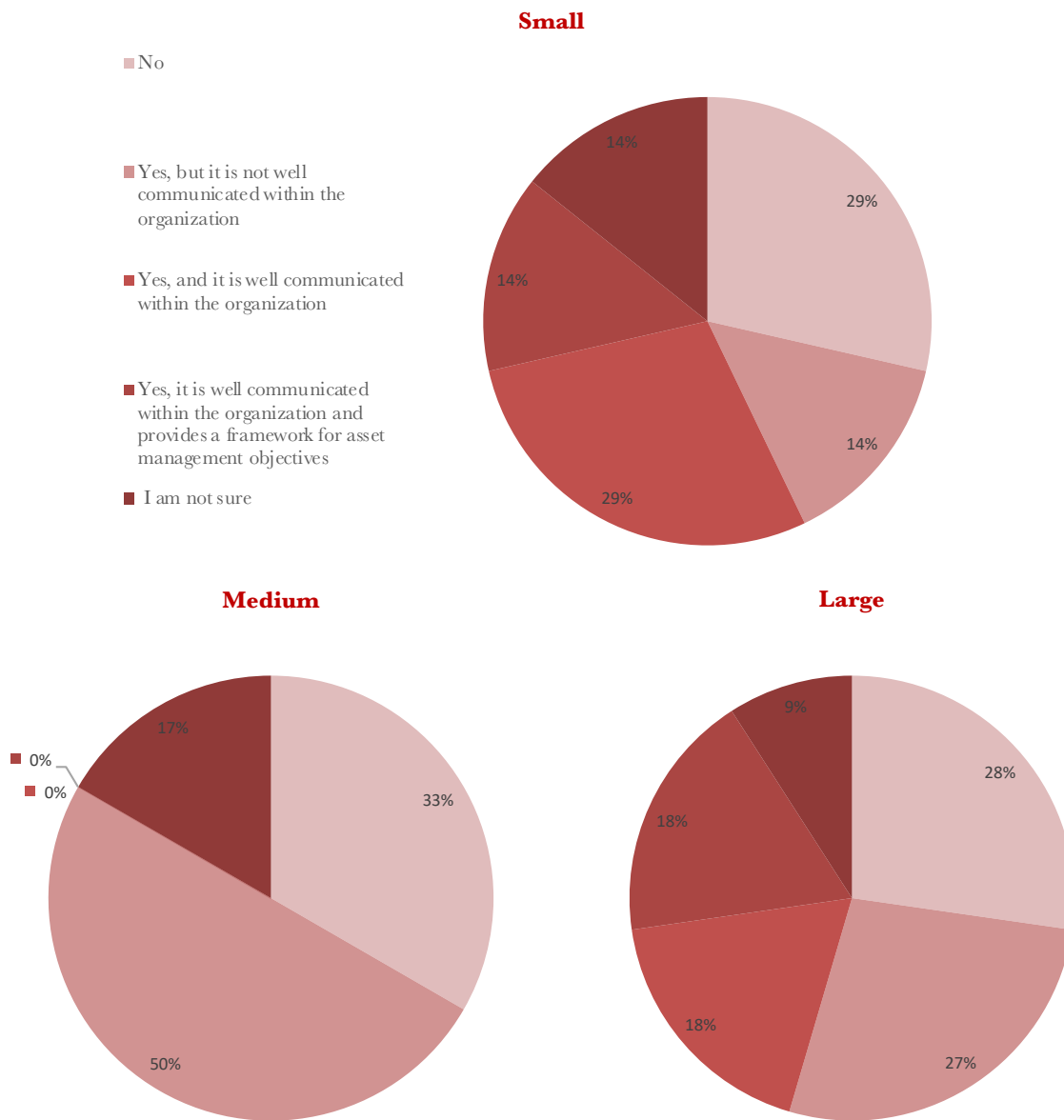
The ON Regulation 588/17 requires municipalities to prepare an Asset Management Policy by July 2019 and expand on Asset Management Plan's requirements from the Ministry of Infrastructure's Building Together. Information on asset's current and proposed Levels of Service must be included in municipalities' core infrastructure Asset Management Plans by 2021 and 2024 respectively.

This regulation also brings awareness to the resilience of infrastructure in face of climate change. Water and wastewater infrastructure are fundamental for urban development and must cope with climate change impacts. Nevertheless, survey results indicate that for 39% of municipalities climate change is not considered in Asset Management Planning. Risk and disaster planning are taken into account by 19% of municipalities and 16% think it is not clear how to put climate change actions into practice, even if climate change is considered in the organization's policy.

What aspects of climate change are considered by your organization in Asset Management Planning? (Question 16)



Does your organization have an Asset Management Policy? (Question 19)

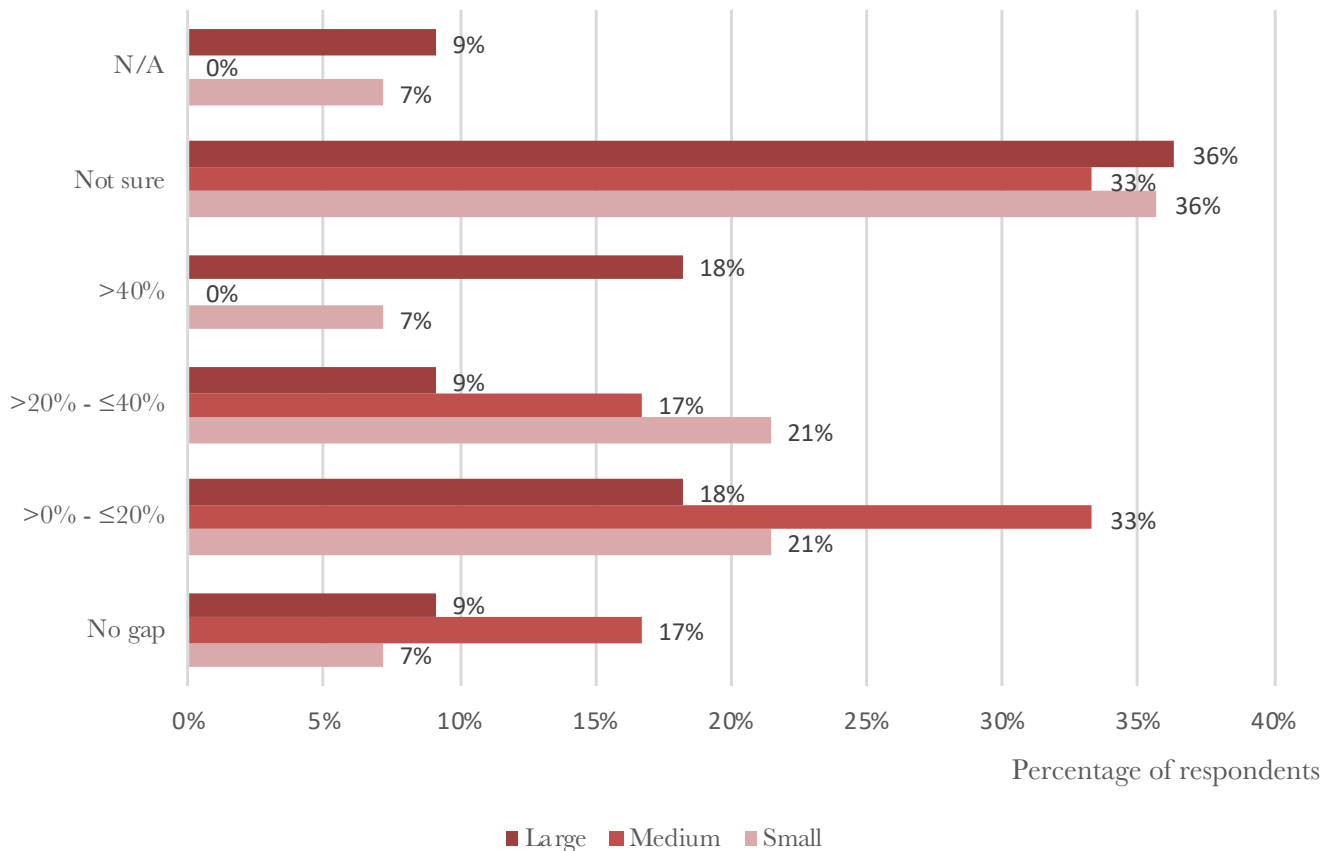


29% of small, 33% of medium and 28% of large municipalities do not have an Asset Management Policy, even with the ON Reg. 588/17 deadline of July 2019 quickly approaching. The Asset Management Policy is not well communicated for 14% of small, 50% of medium and 27% of large municipalities. Nonetheless, progress is definitely being made because of this regulation, and most municipalities now have an Asset Management Policy. Ontario government policies have been critical to drive asset management practices.

2.8. Other Survey Results

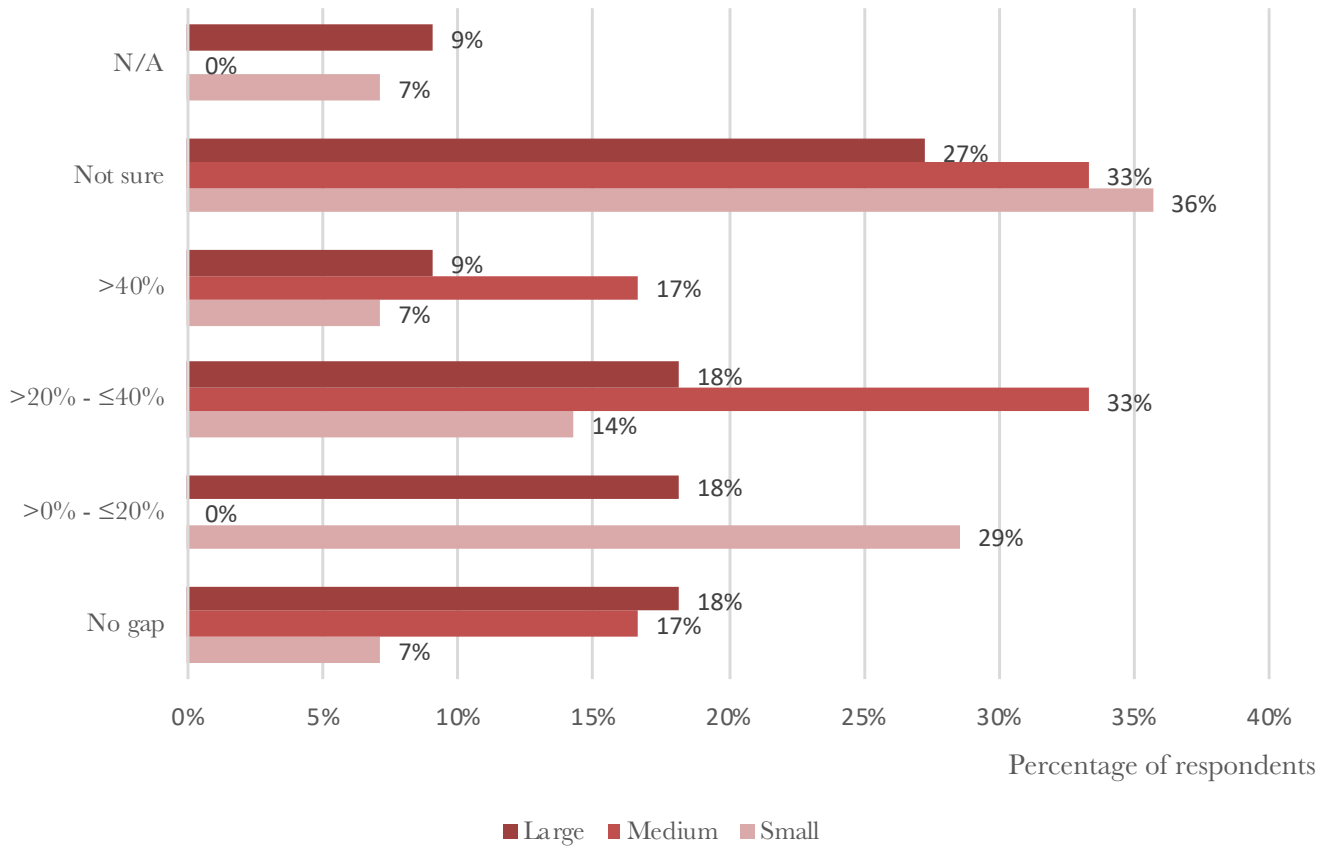
Funding gaps:

Funding gap - water (Question 36)



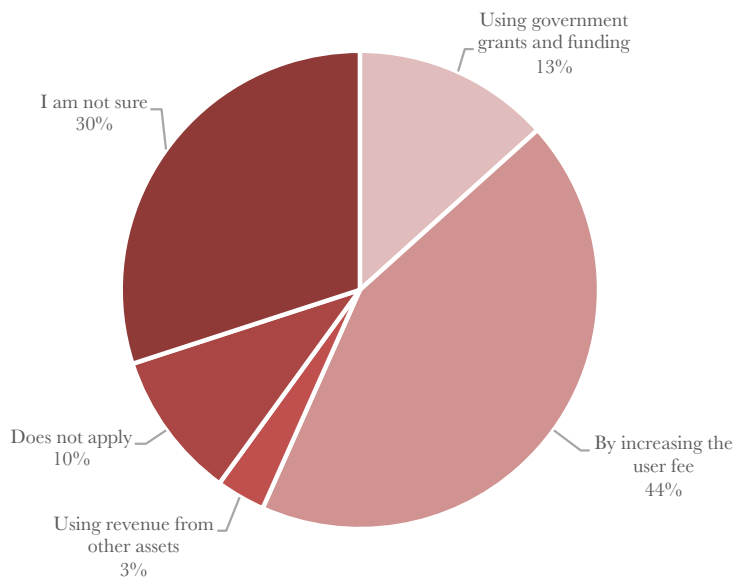
Since about one-third of small and medium municipalities and 9% of large municipalities do not have a process in place to identify funding gaps, it is expected that several respondents would choose the “Not sure” option. Nevertheless, only 7% of small, 17% of medium and 9% large municipalities report having no funding gap for water assets. For 21%, 33% and 18% of the municipalities, respectively, a funding gap of up to 20% has been identified. The funding gap is 20% or greater for 28% of small, 17% of medium and 27% of large municipalities.

Funding gap - wastewater (Question 36)



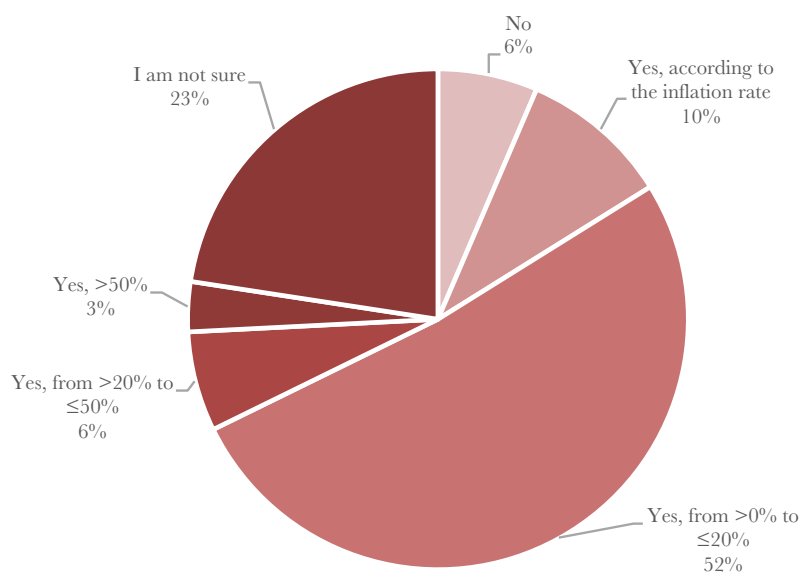
Similarly to the water assets, several respondents chose the “Not sure” option for wastewater assets, as about one-third of small and medium municipalities and 9% of large municipalities do not have a process in place to identify funding gaps. 7% of small, 17% of medium and 18% of large municipalities report having no funding gap for wastewater assets. 29% of small and 18% of large municipalities seem to have a funding gap of up to 20%. Funding gaps over 20% are report by 21% of small, 50% of medium and 27% of large municipalities.

If a funding gap has been identified, how does the organization plan to cover it?
(Question 37)



44% of the respondent municipalities are planning to cover the funding gap by increasing the user fee, whereas 13% are going to use government grants and funding. Some respondents used the comment section to indicate that a mix of the available options would be the preferred alternative and that debt funding is also an option.

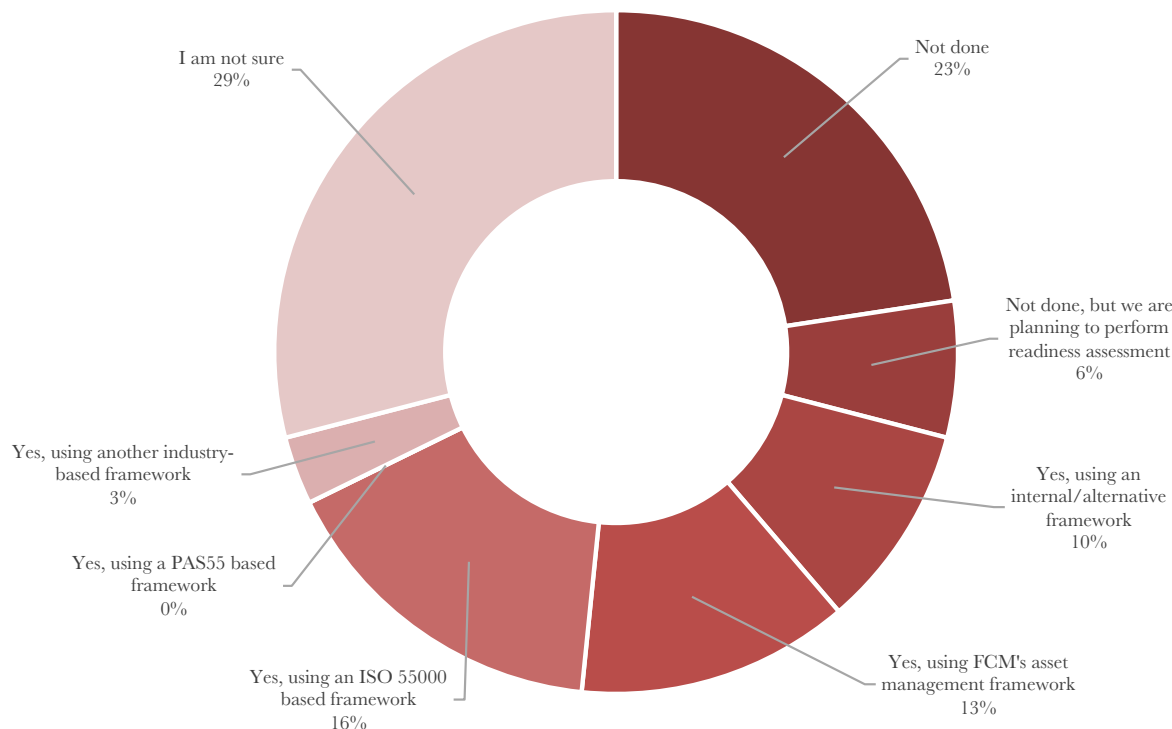
Is your organization planning on increasing water or wastewater user fees for the next 10 years? (Question 38)



Only 6% of respondents are not planning to increase water or wastewater fees in the next 10 years. 10% indicate that fee increases will be based on the inflation rate. 52% of municipalities forecast increasing the fees up to 20% whereas for 9% fees are going to be readjusted by more than 20%.

Readiness assessment:

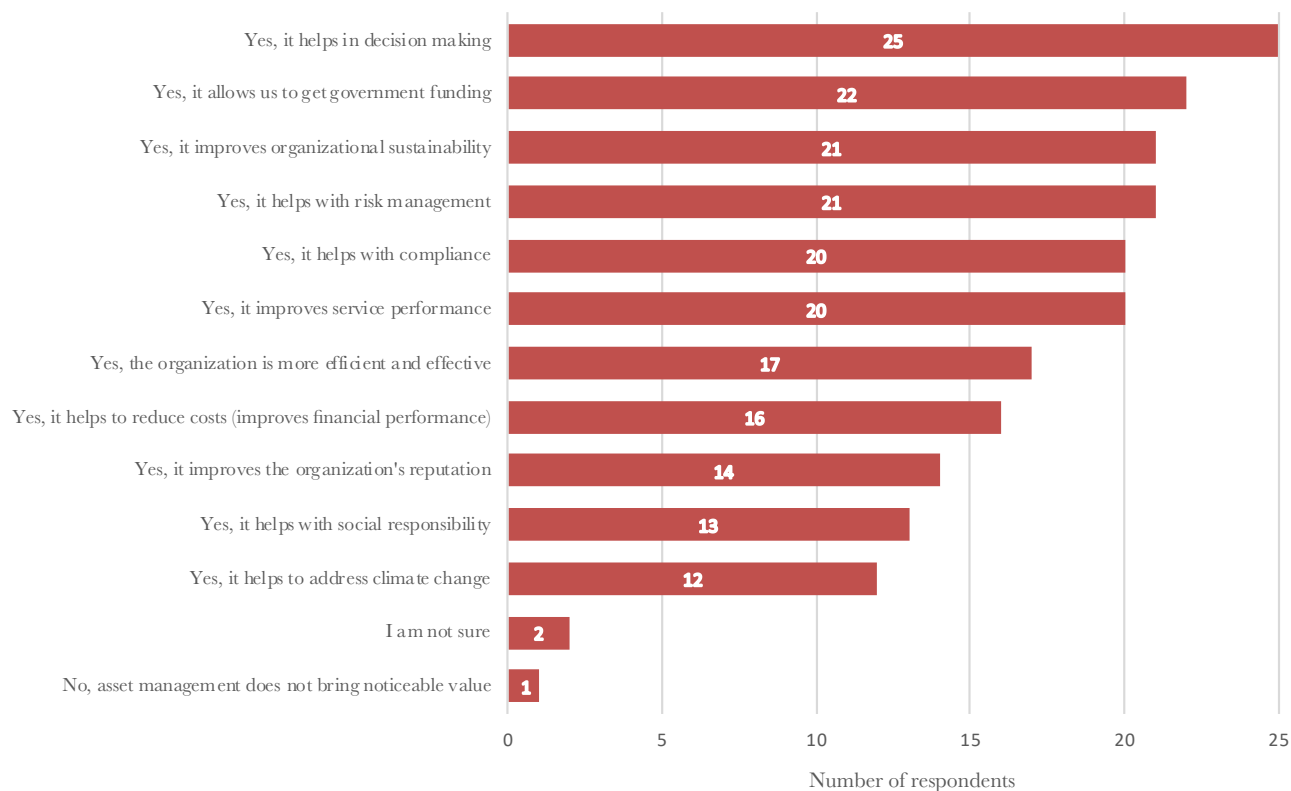
Has your organization completed an asset management maturity/readiness assessment? (Question 7)



Asset management readiness assessment is a great tool to help municipalities identifying aspects they want to improve on their systems and to define the necessary actions for it. 42% of participants completed a readiness assessment by using an alternative framework (10%), the Federation of Canadian Municipalities' framework (13%), an ISO 55000 based framework (16%), or another industry-based framework (3%). 6% out of 29% of the municipalities that indicate not having completed a readiness assessment are planning to perform one.

Asset management perceived value:

Does asset management add value to your organization's business? (Question 6)



Clearly, municipalities recognize the value of infrastructure asset management. This question is a “mark all that apply” type and 81% indicate that asset management helps with decision-making. 71% report that asset management “allows us to get government funding”, which is expected given that the Province of Ontario linked the approval for the Federal Gas Tax Fund to the development and implementation of an Asset Management Plan. Organizational sustainability and risk management are selected by 68% of respondents. The value added by asset management regarding climate change is the least selected value at 39%.



03

Key Takeaways

3. Key Takeaways

This section provides specific information on practices that water utilities need to improve to move to the next readiness level. To achieve a readiness level, all specified competency outcomes must be obtained.

Survey data shows that Small and Medium water utilities are moving towards Readiness Level 1 – LEARNING, while some Large water utilities are approaching and/or achieving Readiness Level 1 and are moving towards Readiness Level 2 – DEVELOPING. It should be noted that in accordance with FCM Readiness Levels – six in total – Ontario Water Utilities are just starting the asset management journey. Ontario government policies and regulations have been critical to get municipal water utilities where they are today. Provincial asset management policies and guidelines will continue to help Ontario water utilities advance in their readiness level.

Small municipalities

- **Policy and governance (current RL=0.36):** to achieve RL 1, municipalities have to better define and communicate the actions needed to achieve their asset management objectives. Some municipalities still need to implement and better communicate their Asset Management Policy. Municipalities might want to establish a framework and start planning their Asset Management Systems.
- **People and leadership (current RL=0.79):** to achieve RL 1, municipalities have to continue their work towards establishing cross-functional asset management teams and defining leadership roles and responsibilities. They should also create awareness about financial resources availability to develop Asset Management Planned actions.
- **Data and information (current RL=0.43):** to achieve RL 1, municipalities should expand the use of asset data analysis to determine asset condition and prioritization. Additionally, they could start establishing processes to use data analysis to determine current and proposed Levels of Service.
- **Planning and decision-making (current RL=0.43):** to achieve RL 1, municipalities need to establish a process to update the Asset Management Plan, so it can be a source of information for decisions. Prioritization of investment decisions should follow the investment plans. More municipalities need to establish a process to identify funding gaps.

- **Contribution to the asset management practice (current RL=0.46):** to achieve RL 1, municipalities must encourage employee's development, especially by identifying longer-term requirements for training, guidance and competence evaluation.

Medium-sized municipalities

- **Policy and governance (current RL=0.17):** to achieve RL 1, asset management objectives need to be clearly defined. The Asset Management Policy must be created and communicated. Municipalities might want to do more work on planning their Asset Management Systems; starting to set up some of the required elements and process would also help.

- **People and leadership (current RL=0.50):** to achieve RL 1, municipalities need to clearly define the roles and responsibilities regarding leadership for implementation, operation, monitoring and improvement of asset management. They also have to continue their work towards setting up cross-functional asset management teams.

- **Data and information (current RL=0.33):** to achieve RL 1, municipalities should expand the use of asset data analysis to determine asset condition and prioritization and start establishing processes to use it to determine current and proposed Levels of Service.

- **Planning and decision-making (RL=0.17):** in order to achieve RL 1, municipalities need to establish a process to update their Asset Management Plans, so it can be a source of information for decisions. More municipalities need to establish a process to identify funding gaps.

- **Contribution to the asset management practice (current RL=0.33):** to achieve RL 1, municipalities need to take a more active approach towards employees' development, especially by identifying longer-term requirements for training, guidance and competence evaluation. They must continue to mitigate the risk of losing information through improved record keeping. Municipalities should make an effort to attend at least one asset management event per year.

Large municipalities

- **Policy and governance (current RL=1.00):** to achieve RL 2, municipalities need to establish a process to monitor the Asset Management Plan implementation. They also should reinforce and continue working on documenting and communicating the asset management objectives. Municipalities

need to improve Asset Management Policy communication in the organization. More work needs to be done regarding the definition and communication of the necessary actions to achieve the asset management objectives (45% of municipalities need to advance this subject). The elements and processes required to an Asset Management System must be set up.

- **People and leadership (current RL=1.18):** to achieve RL 2, municipalities need to clearly define leadership roles and responsibilities for implementation, operation, monitoring and improvement of asset management. Awareness concerning financial resources availability to develop Asset Management Planned actions is also required.

- **Data and information (current RL=0.82):** in order to achieve RL 1, asset data analysis could gradually be used to set current and proposed Levels of Service.

- **Planning and decision-making (current RL=0.55):** in this case, to achieve RL 1, municipalities should continue working on standardizing processes for decision-making prioritization and funding gap identification. These processes need to be well communicated within the organization.

- **Contribution to the asset management practice (current RL=0.55):** to achieve RL 1, municipalities should mainly focus on actively providing employees' asset management training, guidance or competence evaluation.

Lessons learned:

This study had the purpose of measuring the asset management readiness level of municipal water utilities in Ontario and of setting a baseline for future surveys. The values presented here are relative values and are aligned with the FCM methodology. To monitor readiness level progress over time, we recommend that this survey be completed every two years. Increasing the number of respondents for medium-sized municipalities should also be a priority.

Our analysis of Asset Management Plans found that even when Levels of Services are mentioned, they are not categorically determined. This could be the result of municipalities being reluctant to specifically define assets' Levels of Service. Provision of information on the established and benefits for establishing Levels of Service and linking these to financial and performance data could help municipalities improve.

Inventory and condition asset data seem to be relatively well developed in water utilities. The next step concerning data and information entails to collect and analyze accurate performance and financial data. Both are key to determine current and proposed Levels of Service.

Some municipalities are struggling to integrate climate change to asset management practices. The development of guidelines with clear information on how to establish this connection would be extremely helpful. For example, to indicate whether providing an estimative of operational and maintenance costs and capital investments due to climate change mitigation and adaptation actions in the asset investment plan would be sufficient.

Several survey answers revealed that even when water utilities have asset management strategies, policies or objectives, they are often not well communicated. Knowledge dissemination about key documents and actions could empower teams to make smarter decisions, focusing on the organizational goals. Internal asset management communication is crucial for the achievement of goals and should not be forgotten.

The Province of Ontario needs to continue to champion Asset Management Plans if these plans are to be used by municipalities as the main source of information for strategic decision-making. Because of the Province's efforts, 95% of Ontario municipalities already have an Asset Management Plan, when compared to 39% in the other Canadian Provinces [12]. If Ontario is to continue to lead Canada in asset management, the Province must sustain the efforts of developing policies and regulations that will improve readiness levels from LEARNING/DEVELOPING to APPLYING.

Finally, establishing robust and adequate asset management processes is invaluable. Processes are the pieces of the asset management puzzle that together build stronger organizations, capable of providing cost-effective and quality services to our communities.



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Appendix I: Readiness level descriptions

Competencies	Readiness Level 0	Readiness Level 1	Readiness Level 2	Readiness Level 3
Policy and Governance "This competency involves putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and roadmap, and then measuring progress and monitoring implementation over time."	AM is not strategic for the organization. The organization does not have an AM policy, AM objectives, or an AM roadmap (necessary actions to achieve AM objectives). There is no process in place to monitor the AMP's implementation. The organization is not considering to structure an AM System.	The connection between AM and the organization's goals is not clear. The AM policy, objectives and roadmap are not well documented and communicated within the organization, and employees may face difficulties finding this information. Both the development of an AM System and the establishment of a process to monitor AMP implementation are in their early stages.	The organization's strategy and goals are well connected with AM, but resource allocation is still pending. The AM policy, objectives and roadmap are well documented and communicated within the organization. The organization has a process to monitor AMP implementation. Elements of the AM System are in place.	The organization's strategy and goals are well connected with AM and resource allocation has been defined. The AM policy, objectives and roadmap are well documented and communicated within the organization. Additionally, they are connected with external requirements and updated when necessary. The organization has a process to monitor AMP implementation, with council participation. The AM System is established and its progress is being measured.
People and Leadership "This competency involves setting up cross-functional teams with clear accountability, and ensuring adequate resourcing and commitment from senior management and elected officials to advance asset management."	Council is not aware or does not support AM practices, so no human-resources or financial-resources were approved.	People responsible for AM are being appointed, but no AM team or roles and responsibilities are defined yet. Council is still learning about AM benefits. Financial resources were insufficient to develop AM planned actions.	An AM team has been recently established and as a consequence not all roles and responsibilities were defined. The AM team does not count with resources from different departments. Council supports AM and resources were sufficient to implement priority improvements to the AM System.	The AM team is mature, has clear roles and responsibilities and counts with resources from different departments. Council champions AM and consequently there are sufficient financial resources to support AM planned actions.
Data and Information "This competency involves using asset data, performance data and financial data to support effective asset management planning and decision-making."	Regarding data inventory, there is information on some attributes for key assets. Asset data analysis is mostly used for operation and maintenance and no process was established for condition assessment. The asset's level of service is not stated on the AMP. Financial data is mainly used for compliance with PSAB-3150 reporting requirements.	Regarding data inventory, there is information on some attributes for all assets. Asset data analysis is performed and helps to determine asset condition and prioritization. Condition assessment helps to improve operational services. The asset's level of service is not stated on the AMP, but the organization is planning on adding it. Financial data is not only used for compliance with PSAB-3150 reporting requirements but also to set capital and operational expenditures.	Regarding data inventory, there is information on sufficient attributes for all assets. Asset data analysis is performed and helps to determine current levels of service. Condition assessment provides inventory and criticality update. The asset's level of service is stated on the AMP according to regulatory requirements. Financial data is used for compliance with PSAB-3150 reporting requirements; to set capital and operational expenditures; and to determine costs to maintain current levels of service.	Regarding data inventory, there is information on sufficient attributes for all assets linked to its performance. Asset data analysis is performed and helps to determine proposed levels of service. Condition assessment provides investment prioritization and improved decision-making. The asset's level of service is stated on the AMP according to regulatory and technical requirements. Financial data is used for compliance with PSAB-3150 reporting requirements; to set capital and operational expenditures; to determine costs to maintain current levels of service; and to identify future needs and funding gaps.
Planning and Decision-making "This competency involves documenting and standardizing how the organization sets asset management priorities, conducts capital and operations and maintenance (O&M) planning, and decides on budgets."	The organization has not developed an AMP. There is no tool or process in place to manage assets or prioritize investments. Budgeting and capital investments are based on current needs and there is no process in place to identify funding gaps.	The AMP is not taken in consideration in the decision-making process. GIS or other software that aggregates data is the main source of information for asset decisions, and prioritization only addresses short-term needs and varies across the organization. Financial planning for capital investment is usually based on population growth.	The AMP is often used as a source of information for asset management decisions. Prioritization follows asset investment plans and is based on organizational objectives. Short-term financial planning for capital and operational expenditures is based on current levels of service and helps to identify funding gaps.	The AMP is fully integrated with the decision-making processes. Investment prioritization follows asset investment plans and balance the current levels of service with longer-term goals and risks. Long-term financial planning associated with asset lifecycle and levels of service help to identify funding gaps.
Contribution to Asset Management Practice "This competency involves asset management training, developing staff, sharing knowledge internally and participating in external knowledge sharing."	As the organization provided no training on asset management, employees' development is informal and self-driven. Asset management knowledge is concentrated in key people. The organization does not attend asset management events.	The organization facilitated in-house asset management meetings and workshops, but employees' development is still triggered by short-term needs. Internal knowledge sharing is being improved through record keeping. The organization attends at least one asset management event per year.	The organization promotes basic asset management awareness training to all employees. The organization is structuring internal asset management knowledge sharing resources. External opportunities for sharing asset management knowledge are embraced, along with attendance on at least one event per year.	Training and guidance are provided based on competence evaluation, as the organization selects and trains internal experts to support the development of organizational capacity. Internal knowledge and information are freely shared throughout the organization, which actively participates in asset management events and shares its experience with peers.

Appendix II: Additional survey results

Question 3: Does your organization have an asset management team?

Question 3	Small	Medium	Large
No	14%	17%	18%
Not yet, but we have the intention or are in the process of establishing one	14%	33%	9%
Yes, it was created less than 2 years ago	21%	17%	18%
Yes, it was created more than 2 years ago	43%	33%	55%
Does not apply	0%	0%	0%
I am not sure	7%	0%	0%

Question 5: Is asset management part of your organization's strategic plan?

Question 5	Small	Medium	Large
No, asset management is not considered in the organization's strategy and goals	7%	0%	0%
I think so, but the connection between asset management and the organization's goals is not clear	50%	17%	0%
Yes, there is a clear connection between the organization's strategy and goals with asset management, but resource allocation has not been defined	29%	67%	64%
Yes, there is a clear connection between the organization's strategy and goals with asset management, and resource allocation is defined	14%	0%	36%
I am not sure	0%	17%	0%

Question 9: What is the main reason your organization developed an Asset Management Plan?

Question 9	Small	Medium	Large
To satisfy organization's policy	0%	0%	0%
To have access to government funding	21%	17%	18%
To comply with regulatory requirements or guidelines	36%	50%	18%
To serve as a guide/plan for how the organization's assets should be managed	43%	33%	64%
Does not apply	0%	0%	0%
I am not sure	0%	0%	0%

Question 10: Who completed your organization's Asset Management Plan?

Question 10	Small	Medium	Large
I am not sure	7%	0%	0%
The plan was completed by a consultant	21%	33%	27%
The plan was completed internally	29%	33%	45%
The plan was jointly completed by a consultant and internal resources	43%	33%	27%
Does not apply	0%	0%	0%

Question 11: How much did your Asset Management Plan cost?

Question 11	Small	Medium	Large
≤\$20,000	29%	0%	0%
>\$20,000 to ≤ \$40,000	7%	17%	0%
>\$40,000 to ≤\$60,000	0%	0%	0%
>\$60,000 to ≤\$80,000	7%	0%	0%
>\$80,000 to ≤\$100,000	21%	0%	0%
>\$100,000	0%	0%	36%
Does not apply	0%	17%	0%
I am not sure	36%	67%	64%

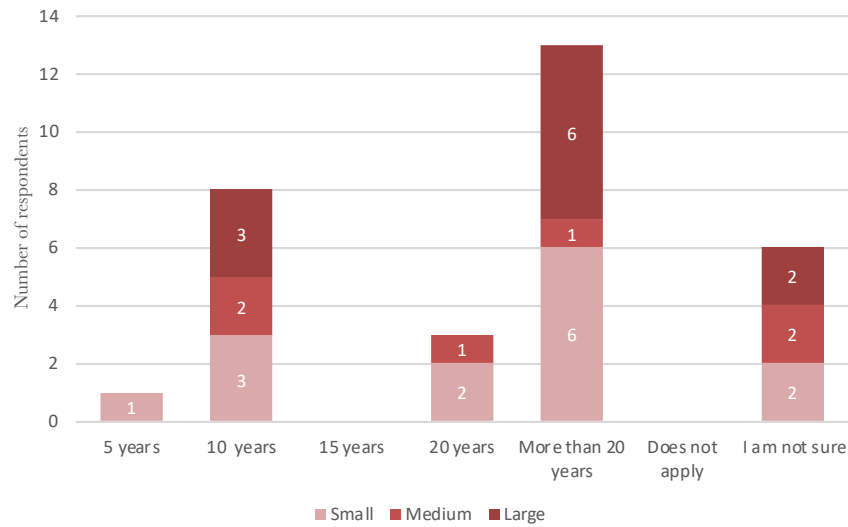
Question 12: How long has your organization had an Asset Management Plan?

Question 12	Small	Medium	Large
≤2 years	0%	0%	9%
>2 to ≤4 years	14%	17%	18%
>4 to ≤6 years	50%	67%	45%
>6 years	14%	17%	27%
Does not apply	0%	0%	0%
I am not sure	21%	0%	0%

Question 13: How often is your Asset Management Plan updated?

Question 13	Small	Medium	Large
Every 1 to ≤3 years	7%	0%	36%
Every >3 to ≤5 years	29%	33%	55%
>5 years	29%	17%	0%
Does not apply	0%	33%	0%
I am not sure	36%	17%	9%

Question 14: What is the asset timeframe considered in your Asset Management Plan?



Question 15: Are the assets' level of service specified in your Asset Management Plan?

Question 15	Small	Medium	Large
No, the plan does not state the level of service	8%	0%	9%
No, but we are planning to add the level of service	23%	50%	9%
Yes, the plan states the level of service according to regulatory requirements	46%	17%	36%
Yes, the plan states the level of service according to regulatory and technical requirements	8%	33%	36%
Does not apply	0%	0%	0%
I am not sure	15%	0%	9%

Question 17: Does your organization have a process to monitor the implementation of your Asset Management Plan?

Question 17	Small	Medium	Large
No	7%	0%	18%
No, but we are planning to establish a process to monitor plan implementation	50%	50%	36%
Yes, our organization monitors the plan implementation through an established process	14%	17%	18%
Yes, plan implementation is overseen by the organization and the council, through an established process	7%	17%	27%
Does not apply	0%	17%	0%
I am not sure	21%	0%	0%

Question 18: Does your organization have defined asset management objectives?

Question 18	Small	Medium	Large
No	21%	50%	18%
Yes, but asset management objectives are not well documented or communicated	43%	17%	9%
Yes, asset management objectives are well documented, communicated and consistent with the organization's objectives	14%	33%	18%
Yes, asset management objectives are well documented, communicated, and are consistent with the organization's objectives and additional requirements (technical, financial, regulatory, etc.)	14%	0%	36%
I am not sure	7%	0%	18%

Question 21: Has your organization established an Asset Management System?

Question 21	Small	Medium	Large
No	21%	33%	18%
No, but we are planning to establish an Asset Management System	29%	67%	18%
Yes, we have set up the elements and processes required to an Asset Management System	29%	0%	27%
Yes, we have established an Asset Management System and are measuring and monitoring its progress over time	0%	0%	18%
I am not sure	21%	0%	18%

Question 22: Does your organization have clearly defined roles and responsibilities regarding leadership for implementation, operation, monitoring and improvement of asset management?

Question 22	Small	Medium	Large
No	14%	50%	18%
Yes, there are people responsible for asset management, but roles and responsibilities are not defined	29%	33%	9%
Yes, there is an accountable asset management team, but not all roles and responsibilities are defined	43%	17%	45%
Yes, there is an asset management team and their roles and responsibilities are clearly defined	7%	0%	27%
I am not sure	7%	0%	0%

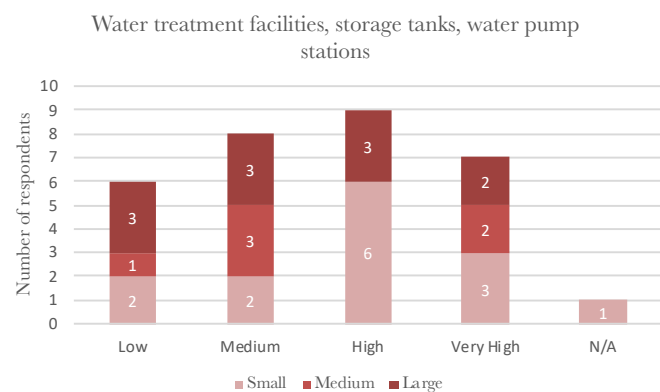
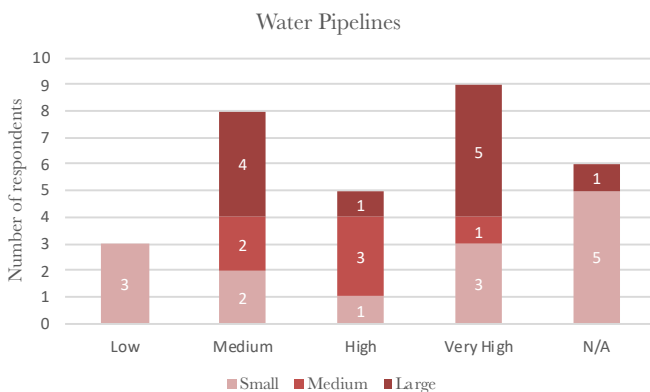
Question 23: Has your organization established an asset management team with members from different departments?

Question 23	Small	Medium	Large
No asset management human resources were appointed so far	14%	17%	18%
Not yet, but the organization has appointed human resources to define and introduce an appropriate asset management framework	14%	0%	9%
The organization has established an asset management team, but it does not comprise human resources from different departments	14%	50%	9%
Yes, an asset management team with human resources from different departments is established	43%	33%	64%
I am not sure	14%	0%	0%

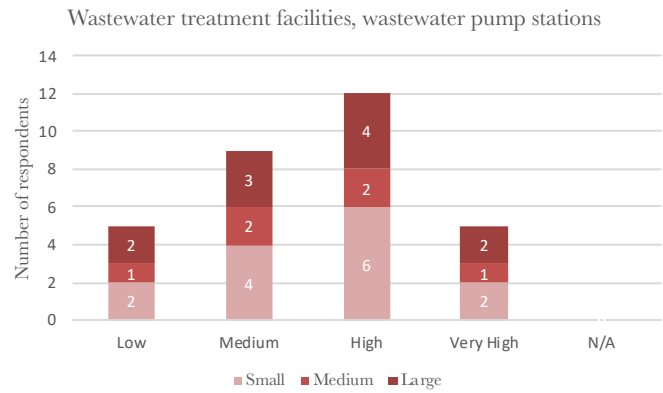
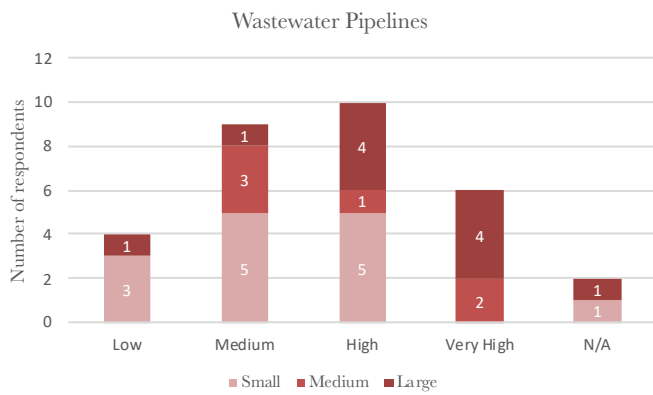
Question 24: Does your organization have council's support and commitment concerning asset management practices?

Question 24	Small	Medium	Large
No	0%	0%	9%
Yes, but council is not aware of asset management practices requirements	29%	33%	0%
Yes, council demonstrates buy-in and support for asset management	57%	33%	64%
Yes, council champions asset management as a core business function	0%	17%	0%
I am not sure	14%	17%	27%

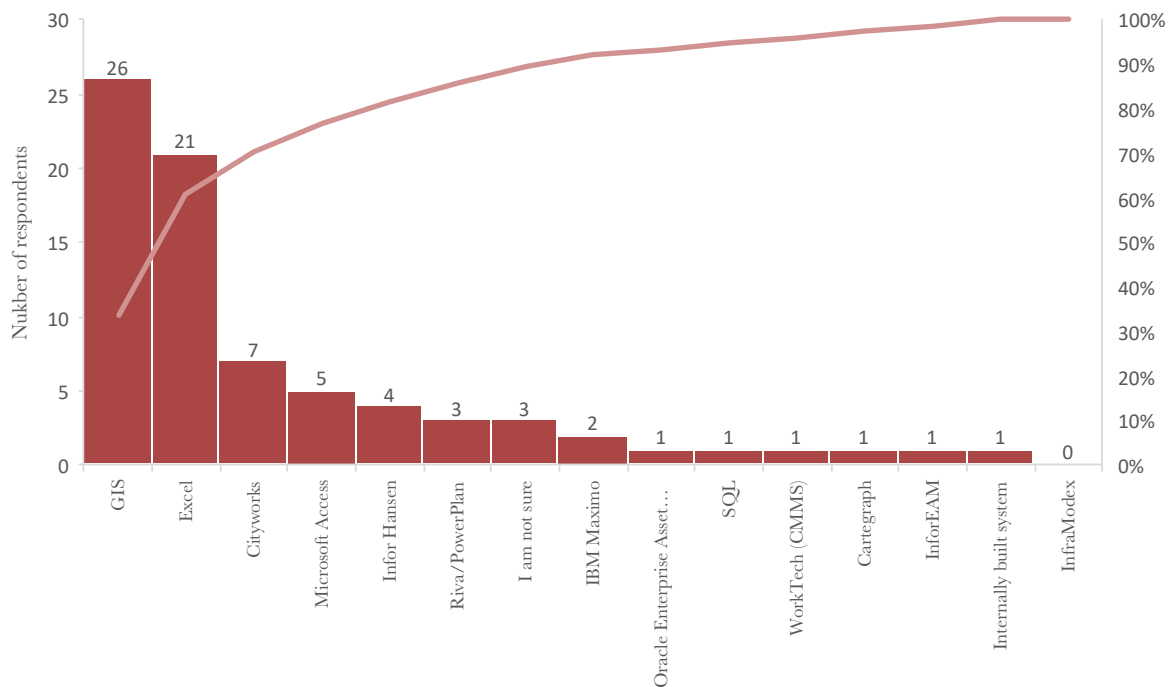
Question 27: What is the confidence level in your organization regarding asset data inventory?



Question 27: What is the confidence level in your organization regarding asset data inventory?



Question 28: What tools are used by your organization to manage assets and data?



Question 29: What is the main benefit your organization can derive from the current asset condition assessment practices?

Question 29	Small	Medium	Large
None, the organization has not established a process for condition assessment	14%	17%	0%
Improved operation services	0%	17%	18%
Inventory and criticality update	14%	0%	18%
Asset investment prioritization and improved decision-making	64%	67%	64%
I am not sure	7%	0%	0%

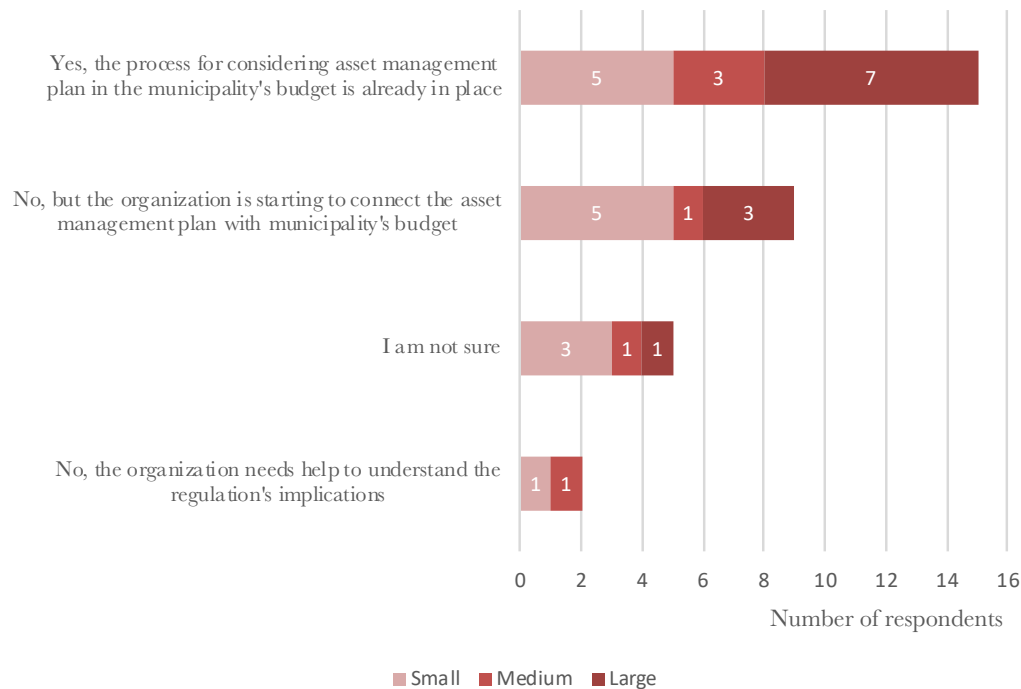
Question 30: Does your organization perform asset data analysis?

Question 30	Small	Medium	Large
No, the organization works with limited asset data information and analysis, mostly used for operation and maintenance	31%	50%	9%
Yes, data analysis helps to determine asset condition and prioritization	54%	50%	64%
Yes, data analysis helps to determine current levels of service	0%	0%	0%
Yes, data analysis combines different data inputs to determine proposed levels of service	0%	0%	27%
I am not sure	15%	0%	0%

Question 32: What is the main asset management source of information for planning and decision-making in your organization?

Question 32	Small	Medium	Large
There is no tool or source of information in place to manage assets	21%	17%	0%
GIS or other software that aggregates data	43%	67%	45%
Asset management plan	36%	17%	36%
Asset management plan aligned with the asset investment plan	0%	0%	9%
I am not sure	0%	0%	9%

Question 33: Has your organization established a process to address the new 588/17 Ontario Regulation?



Question 40: Did your organization provide asset management training, guidance/mentoring or competence evaluation?

Question 40	Small	Medium	Large
No, it had a "hit the ground running" approach	33%	67%	45%
Yes, it provided guidance through in-house asset management meetings/workshops	33%	0%	9%
Yes, it provided training by hiring specialized third parties or sending human resources to external training sessions	17%	33%	18%
Yes, it evaluated the competences needed and provided training and guidance based on them	0%	0%	9%
I am not sure	17%	0%	18%

Question 41: Does your organization encourage internal asset management knowledge sharing?

Question 41	Small	Medium	Large
No, asset management knowledge and information are concentrated in key people	15%	33%	18%
Yes, the organization is mitigating the risk of losing information through improved record keeping	23%	50%	36%
Yes, the organization is structuring asset management knowledge sharing resources	31%	17%	9%
Yes, asset management knowledge and information are freely shared throughout the organization	8%	0%	36%
I am not sure	23%	0%	0%

Question 42: Does your organization participate in asset management events?

Question 42	Small	Medium	Large
No, the organization does not attend asset management events	15%	17%	0%
Yes, the organization attends at least one event every year	38%	50%	36%
Yes, the organization attends at least one event per year and constantly searches for knowledge sharing opportunities	8%	17%	18%
Yes, the organization actively participates in asset management events and shares its experience with peers	23%	0%	27%
I am not sure	15%	17%	18%

Appendix III: Survey questions

Background Questions

1. What is the size of population served by your municipality or utility?

- Very small: less than 5,000 people
- Small: less than 29,999 people
- Medium: 30,000 to 99,999 people
- Large: 100,000 to 399,999 people
- Very large: more than 400,000 people

2. What is the classification of your municipality regarding lower-, upper and single-tier?

Lower-tier municipalities: in this case, another level of municipal government, for instance a county or region, is involved in providing services to residents.

Upper-tier municipalities: provide services, such as arterial roads; transit; policing; sewer and water systems; waste disposal; region-wide land use planning and development; health and social services.

Single-tier municipalities: have responsibilities for all local services to their residents.

Definition by AMO (Association of Municipalities Ontario)

- Lower-tier
- Upper-tier
- Single-tier
- I am not sure

3. Does your organization have an asset management team?

Asset management team: a group of representatives from different departments who conduct AM duties. (FCM)

- No
- Not yet, but we have the intention or are in the process of establishing one
- Yes, it was created less than 2 years ago
- Yes, it was created more than 2 years ago
- Does not apply
- I am not sure

4. Which asset types are managed by your asset management team?

Mark all alternatives that apply. The "does not apply" option excludes all other alternatives.

- ☐ Water pipelines
- ☐ Water treatment facilities; storage tanks (after water treatment); water pump stations
- ☐ Wastewater pipelines
- ☐ Wastewater treatment facilities; wastewater pump stations
- ☐ Storm water: pipelines and ponds
- ☐ Roads
- ☐ Does not apply
- ☐ I am not sure

Strategic Vision and Asset Management Plan

This section addresses the organization's strategic vision and its connection with asset management, as well as information on Asset Management Plans.

5. Is asset management part of your organization's strategic plan?

Asset Management: coordinated activity of an organization to realize value from assets. (definition by ISO 55000)

Strategic plan: a document that establishes broad organizational goals and a sequence of steps to achieve them, as well as resource allocation.

- ☐ No, asset management is not considered in the organization's strategy and goals
- ☐ I think so, but the connection between asset management and the organization's goals is not clear
- ☐ Yes, there is a clear connection between the organization's strategy and goals with asset management, but resource allocation has not been defined
- ☐ Yes, there is a clear connection between the organization's strategy and goals with asset management, and resource allocation is defined
- ☐ I am not sure

6. Does asset management add value to your organization's business?

Mark all alternatives that apply. The "No" alternative excludes all other alternatives.

Value, in this case, is connected to benefits. Some possible values are: improved financial performance, informed asset investment decisions, risk management, improved services and outputs, demonstrated social responsibility, demonstrated compliance, enhanced reputation, improved organizational sustainability, improved efficiency and effectiveness.

- ☐ No, asset management does not bring noticeable value
- ☐ Yes, it helps to reduce costs (improves financial performance)

- Yes, it allows us to get government funding
- Yes, it helps in decision making
- Yes, it helps with risk management
- Yes, it helps to address climate change
- Yes, it improves service performance
- Yes, it helps with social responsibility
- Yes, it helps with compliance
- Yes, it improves the organization's reputation
- Yes, it improves organizational sustainability
- Yes, the organization is more efficient and effective
- I am not sure

7. Has your organization completed an asset management maturity/readiness assessment?

Asset management maturity/readiness tool places the organization in a maturity/readiness scale by means of structured questions based on a specific framework or regulatory requirements.

- Not done
- Not done, but we are planning to perform readiness assessment
- Yes, using an internal/alternative framework
- Yes, using FCM's asset management framework
- Yes, using an ISO 55000 based framework
- Yes, using a PAS55 based framework
- Yes, using another industry-based framework
- I am not sure

8. Does your organization have an Asset Management Plan?

Asset Management Plan: a strategic document that states how a group of assets is to be managed over a period of time. The plan describes the characteristics and condition of infrastructure assets, the Levels of Service expected from them, planned actions to ensure that the assets provide the expected level of service, and financing strategies to implement the planned actions. (Building Together - Guide for municipal Asset Management Plans)

- No
- No, but we are planning to develop an Asset Management Plan
- Yes, but the plan is not taken in consideration in the decision-making process
- Yes, and sometimes decisions are based on the plan
- Yes, and the plan is fully integrated with the organization's decision-making processes
- I am not sure

9. What is the main reason your organization developed an Asset Management Plan?

- ☐ To have access to government funding
- ☐ To comply with regulatory requirements or guidelines
- ☐ To satisfy organization's policy
- ☐ To serve as a guide/plan for how the organization's assets should be managed
- ☐ Does not apply
- ☐ I am not sure

10. Who completed your organization's Asset Management Plan?

- ☐ The plan was completed internally
- ☐ The plan was completed by a consultant
- ☐ The plan was jointly completed by a consultant and internal resources
- ☐ Does not apply
- ☐ I am not sure

11. How much did your Asset Management Plan cost?

- ☐ ≤\$20,000
- ☐ >\$20,000 to ≤ \$40,000
- ☐ >\$40,000 to ≤\$60,000
- ☐ >\$60,000 to ≤\$80,000
- ☐ >\$80,000 to ≤\$100,000
- ☐ >\$100,000
- ☐ Does not apply
- ☐ I am not sure

12. How long has your organization had an Asset Management Plan?

- ☐ ≤2 years
- ☐ >2 to ≤4 years
- ☐ >4 to ≤6 years
- ☐ >6 years
- ☐ Does not apply
- ☐ I am not sure

13. How often is your Asset Management Plan updated?

- ☐ Every 1 to ≤3 years
- ☐ Every >3 to ≤5 years
- ☐ >5 years
- ☐ Does not apply
- ☐ I am not sure

14. What is the asset timeframe considered in your Asset Management Plan?

- ☐ 5 years
- ☐ 10 years
- ☐ 15 years
- ☐ 20 years
- ☐ More than 20 years
- ☐ Does not apply
- ☐ I am not sure

15. Are the assets' level of service (LoS) specified in your Asset Management Plan?

Level of Service: outline the overall quality, function, capacity and safety of the service being provided and represent the minimum condition that assets should be maintained at during their lifecycle. (based on SUMA and Richmond Hill Asset Management Plan)

- ☐ No, the plan does not state the level of service
- ☐ No, but we are planning to add the level of service
- ☐ Yes, the plan states the level of service according to regulatory requirements
- ☐ Yes, the plan states the level of service according to regulatory and technical requirements
- ☐ Does not apply
- ☐ I am not sure

16. What aspects of climate change are considered by your organization in Asset Management Planning?

Mark all alternatives that apply. The “does not apply” option excludes all other alternatives.

- ☐ Climate change was not considered in Asset Management Planning
- ☐ Climate change is considered in our policy, however it is not clear how to put that into action
- ☐ Anticipated costs
- ☐ Mitigation and adaptation approaches
- ☐ Risk and disaster planning
- ☐ Does not apply
- ☐ I am not sure

17. Does your organization have a process to monitor the implementation of your Asset Management Plan?

Asset Management Plan implementation: planning and implementation of the Asset Management Plan's recommended actions, which are necessary to the advancement of asset management in the organization.

- ☐ No
- ☐ No, but we are planning to establish a process to monitor plan implementation
- ☐ Yes, our organization monitors the plan implementation through an established process
- ☐ Yes, plan implementation is overseen by the organization and the council, through an established process
- ☐ Does not apply
- ☐ I am not sure

Policy and Governance

This competency involves putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and framework, and then measuring and monitoring implementation over time. (FCM's Asset Management Readiness Scale)

18. Does your organization have defined asset management objectives?

The Strategic Asset Management Plan (SAMP) or Asset Management Strategy should document the relationship between the organizational objectives and the asset management objectives, and should define the framework required to achieve the asset management objectives.

Asset Management Objectives: the goals to be reached by the asset management system, such as to expand the Asset Management Plan for non-core assets; to extend the financial planning from 5 to 20 years; to complete pipe inspection to determine condition grade, etc. Definition by ISO55002 (modified).

- ☐ No
- ☐ Yes, but asset management objectives are not well documented or communicated
- ☐ Yes, asset management objectives are well documented, communicated and consistent with the organization's objectives
- ☐ Yes, asset management objectives are well documented, communicated, and are consistent with the organization's objectives and additional requirements (technical, financial, regulatory, etc.)
- ☐ I am not sure

19. Does your organization have an Asset Management Policy?

Asset management policy: a document that sets out the principles by which the organization intends to apply asset management to achieve its organizational objectives. The policy should set out the organization's commitments and expectations for decisions, activities and behavior concerning asset management. Definition by ISO55002.

- ☐ No
- ☐ Yes, but it is not well communicated within the organization
- ☐ Yes, and it is well communicated within the organization
- ☐ Yes, it is well communicated within the organization and
- ☐ provides a framework for asset management objectives
- ☐ I am not sure

20. Did your organization define the necessary actions to achieve its asset management objectives?

- ☐ No
- ☐ Yes, but the actions are not well communicated within the organization
- ☐ Yes, the actions are well communicated within the organization
- ☐ Yes, the actions are well communicated within the organization and updated when necessary
- ☐ I am not sure

21. Has your organization established an Asset Management System?

Asset Management System: a set of interrelated and interacting elements of an organization, which has the function of establishing the Asset Management Policy and asset management objectives, and the processes needed to achieve those objectives. Definition by ISO55000.

- ☐ No
- ☐ No, but we are planning to establish an Asset Management System
- ☐ Yes, we have set up the elements and processes required to an Asset Management System
- ☐ Yes, we have established an Asset Management System and are measuring and monitoring its progress over time
- ☐ I am not sure

People and Leadership

This competency involves setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from senior management and elected officials to advance asset management. (FCM's Asset Management Readiness Scale)

22. Does your organization have clearly defined roles and responsibilities regarding leadership for implementation, operation, monitoring and improvement of asset management?

- ☐ No
- ☐ Yes, there are people responsible for asset management, but roles and responsibilities are not defined
- ☐ Yes, there is an accountable asset management team, but not all roles and responsibilities are defined
- ☐ Yes, there is an asset management team and their roles and responsibilities are clearly defined
- ☐ I am not sure

23. Has your organization established an asset management team with members from different departments?

- ☐ No asset management human resources were appointed so far
- ☐ Not yet, but the organization has appointed human resources to define and introduce an appropriate asset management framework
- ☐ The organization has established an asset management team, but it does not comprise human resources from different departments
- ☐ Yes, an asset management team with human resources from different departments is established
- ☐ I am not sure

24. Does your organization have council's support and commitment concerning asset management practices?

- ☐ No
- ☐ Yes, but council is not aware of asset management practices requirements
- ☐ Yes, council demonstrates buy-in and support for asset management
- ☐ Yes, council champions asset management as a core business function
- ☐ I am not sure

25. Did your organization allocate sufficient financial resources last year to develop the Asset Management Planned actions?

Example of Asset Management Planned actions: employee training, equipment acquisition, establishing an AM team, etc.

- ☐ No, asset management financial resources were not approved by council
- ☐ No, the allocated financial resources were not sufficient to develop the planned actions
- ☐ Yes, but the planned actions only comprised priority improvements to the asset management system
- ☐ Yes, there were sufficient financial resources to support the Asset Management Planned actions
- ☐ I am not sure

Data and Information

This competency involves using asset data, performance data and financial data to support effective Asset Management Planning and decision-making. (FCM's Asset Management Readiness Scale)

26. Does your organization have asset data inventory?

Limited: some attributes (e.g. ID, age) for key assets.

Basic: some attributes for all assets.

Adequate: sufficient attributes for all assets.

Comprehensive: sufficient attributes for all assets linked to performance information (e.g. number of breaks).

- ☐ No, the organization works with limited asset data information
- ☐ Yes, the organization works with basic asset data information
- ☐ Yes, the organization works with adequate asset data information
- ☐ Yes, the organization works with comprehensive asset data information
- ☐ I am not sure

27. What is the confidence level in your organization regarding asset data inventory?

- ☐ Water pipelines (Low/Medium/High/Very High/(N/A))
- ☐ Water treatment facilities; storage tanks (after water treatment); water pump stations (Low/Medium/High/Very High/(N/A))
- ☐ Wastewater pipelines (Low/Medium/High/Very High/(N/A))
- ☐ Wastewater treatment facilities; wastewater pump stations (Low/Medium/High/Very High/(N/A))
- ☐ Storm water: pipelines and ponds (Low/Medium/High/Very High/(N/A))
- ☐ Roads (Low/Medium/High/Very High/(N/A))

28. What tools are used by your organization to manage assets and data?

Mark all alternatives that apply.

- ☐ I am not sure
- ☐ GIS
- ☐ IBM Maximo
- ☐ Cityworks
- ☐ Infor Hansen
- ☐ Riva/PowerPlan
- ☐ Excel
- ☐ Microsoft Access

- Oracle Enterprise Asset Management
- InfraModex
- Other (please specify)

29. What is the main benefit your organization can derive from the current asset condition assessment practices?

- None, the organization has not established a process for condition assessment
- Improved operation services
- Inventory and criticality update
- Asset investment prioritization and improved decision-making
- I am not sure

30. Does your organization perform asset data analysis?

- No, the organization works with limited asset data information and analysis, mostly used for operation and maintenance
- Yes, data analysis helps to determine asset condition and prioritization
- Yes, data analysis helps to determine current Levels of Service
- Yes, data analysis combines different data inputs to determine proposed Levels of Service
- I am not sure

31. How is financial data used in your organization?

PSAB-3150: is the Public Sector Accounting Board's standard guiding the treatment of tangible capital assets.

Mark all alternatives that apply.

- For yearly PSAB-3150 reporting requirements
- To set capital and operational expenditures
- To determine costs to maintain current Levels of Service
- To identify future needs and funding gaps
- I am not sure

Planning and Decision-making

This competency involves documenting and standardizing how the organization sets asset management priorities, conducts capital and operations and maintenance (O&M) planning, and decides on budgets. (FCM's Asset Management Readiness Scale)

32. What is the main asset management source of information for planning and decision-making in your organization?

- There is no tool or source of information in place to manage assets
- GIS or other software that aggregates data
- Asset Management Plan
- Asset Management Plan aligned with the asset investment plan
- I am not sure

33. Has your organization established a process to address the new 588/17 Ontario Regulation?

588/17 Ontario Regulation: urges municipalities to prepare a Strategic Asset Management Policy by July 2019. Said policy must include “the process by which the Asset Management Plan is to be considered in the development of the municipality’s budget or of any long-term financial plans...”.

- No, the organization needs help to understand the regulation's implications
- No, but the organization is starting to connect the Asset Management Plan with municipality's budget
- Yes, the process for considering Asset Management Plan in the municipality's budget is already in place
- I am not sure

34. How does your organization prioritize asset management investment decisions?

- Priority evaluation is based on experience, council and management input, and available information
- Prioritization usually addresses short-term needs and teams set priorities independently of each other
- Prioritization follows asset investment plans and are based on organizational objectives
- Prioritization follows asset investment plans and balance the current Levels of Service with longer-term goals and risks
- I am not sure

35. Does your organization have a process in place to identify possible future funding gaps?

- None, budgeting and capital investments are based on current needs.
- Yes, financial planning for capital investment is based on population growth.
- Yes, short-term (less than 5 years) financial planning for capital and operational expenditures is based on current Levels of Service
- Yes, long-term (more than 10 years) financial planning associated with asset lifecycle and Levels of Service
- I am not sure

36. Has a funding gap been identified for any of the following assets?

Please choose the percentage of the funding gap related to the timeframe and total budget identified for each asset type managed by your organization.

- ☐ Water (No gap / >0% - ≤20% / >20% - ≤40% / >40% / Not sure / (N/A))
- ☐ Wastewater (No gap / >0% - ≤20% / >20% - ≤40% / >40% / Not sure / (N/A))
- ☐ Storm water (No gap / >0% - ≤20% / >20% - ≤40% / >40% / Not sure / (N/A))
- ☐ Roads (No gap / >0% - ≤20% / >20% - ≤40% / >40% / Not sure / (N/A))
- ☐ Other (please specify)

37. If a funding gap has been identified, how does the organization plan to cover it?

- ☐ Using government grants and funding
- ☐ By increasing the user fee
- ☐ Using revenue from other assets (i.e. using water fee to cover road and/or storm water expenses)
- ☐ Does not apply
- ☐ I am not sure

38. Is your organization planning on increasing your water or wastewater user fees for the next 10 years?

- ☐ No
- ☐ Yes, according to the inflation rate
- ☐ Yes, from >0% to ≤20%
- ☐ Yes, from >20% to ≤50%
- ☐ Yes, >50%
- ☐ Does not apply
- ☐ I am not sure

Contribution to Asset Management Practice

This competency involves asset management training and developing employees, sharing knowledge internally and participating in external knowledge sharing. (FCM's Asset Management Readiness Scale)

39. Does your organization encourage employees' asset management development?

- ☐ No, asset management development approach is informal and largely driven by the initiative of team members
- ☐ Yes, but asset management development requirements are based on short-term needs (e.g. regulatory requirements)
- ☐ Yes, the organization promotes basic asset management awareness training to all employees
- ☐ Yes, the organization selects and trains internal experts to support the development of organizational capacity
- ☐ I am not sure

40. Did your organization provide asset management training, guidance/mentoring or competence evaluation?

- ☐ No, it had a "hit the ground running" approach
- ☐ Yes, it provided guidance through in-house asset management meetings/workshops
- ☐ Yes, it provided training by hiring specialized third parties or sending human resources to external training sessions
- ☐ Yes, it evaluated the competences needed and provided training and guidance based on them
- ☐ I am not sure

41. Does your organization encourage internal asset management knowledge sharing?

- ☐ No, asset management knowledge and information are concentrated in key people
- ☐ Yes, the organization is mitigating the risk of losing information through improved record keeping
- ☐ Yes, the organization is structuring asset management knowledge sharing resources
- ☐ Yes, asset management knowledge and information are freely shared throughout the organization
- ☐ I am not sure

42. Does your organization participate in asset management events?

- ☐ No, the organization does not attend asset management events
- ☐ Yes, the organization attends at least one event every year
- ☐ Yes, the organization attends at least one event per year and constantly searches for knowledge sharing opportunities
- ☐ Yes, the organization actively participates in asset management events and shares its experience with peers
- ☐ I am not sure

Specific Background Questions

43. Does your organization manage any of the following asset categories?

Mark all alternatives that apply. The "Does not apply" option excludes all other alternatives.

- ☐ Water treatment facilities; storage tanks (after water treatment); water pump stations
- ☐ Water pipelines
- ☐ Wastewater treatment facilities; wastewater pump stations
- ☐ Wastewater pipelines
- ☐ Storm water: pipelines and ponds
- ☐ Roads
- ☐ Does not apply
- ☐ I am not sure

44. What is the estimated replacement value of your organization's water treatment facilities, storage tanks (after water treatment), and water pump stations?

- ☐ Less than \$200 million
- ☐ Between \$200 and \$500 million
- ☐ Between \$500 million and \$1 billion
- ☐ Greater than \$1 billion
- ☐ Does not apply
- ☐ I am not sure

45. What is the estimated replacement value of your organization's potable water pipelines?

- ☐ Less than \$200 million
- ☐ Between \$200 and \$500 million
- ☐ Between \$500 million and \$1 billion
- ☐ Greater than \$1 billion
- ☐ Does not apply
- ☐ I am not sure

46. What is the estimated replacement value of your organization's wastewater treatment facilities and wastewater pump stations?

- ☐ Less than \$200 million
- ☐ Between \$200 and \$500 million
- ☐ Between \$500 million and \$1 billion
- ☐ Greater than \$1 billion
- ☐ Does not apply
- ☐ I am not sure

47. What is the estimated replacement value of your organization's wastewater pipelines?

- ☐ Less than \$200 million
- ☐ Between \$200 and \$500 million
- ☐ Between \$500 million and \$1 billion
- ☐ Greater than \$1 billion
- ☐ Does not apply
- ☐ I am not sure

48. What is the estimated total length of potable water pipelines managed by your organization?

- ☐ Less than 100Km
- ☐ Between 100 and 299Km
- ☐ Between 300 and 499Km

- Between 500Km and 799Km
- Greater than 800Km
- Does not apply
- I am not sure

49. What is the estimated total length of storm water linear assets managed by your organization?

- Less than 100Km
- Between 100 and 299Km
- Between 300 and 499Km
- Between 500Km and 799Km
- Greater than 800Km
- Does not apply
- I am not sure

Identification of target population

50. What is your department?

Choose one alternative. If none of them apply choose "Other" and specify.

- Engineering
- Planning
- Operations
- Finance
- Asset Management
- Other (please specify)

51. Please provide your job title or the closest applicable designation presented on the alternatives.

Choose one alternative. If none of them apply choose "Other" and specify.

Specific AM Group: oversees one asset type

Corporate AM Group: oversees more than one asset type

- Director (Specific AM Group / Corporate AM Group)
- Manager (Specific AM Group / Corporate AM Group)
- Analyst/Specialist (Specific AM Group / Corporate AM Group)
- Technician (Specific AM Group / Corporate AM Group)
- Other (please specify)

52. In relation to asset management decisions, my responsibilities:

- ☐ Have no connection with asset management decisions
- ☐ Influence asset management decisions
- ☐ Include being part of a group that is responsible for asset management decisions
- ☐ Include being responsible for the development and implementation of decisions
- ☐ Does not apply
- ☐ I am not sure

53. Did you use information or input from other departments besides your own to answer the survey?

Choose one alternative. If the "Yes" alternative applies, please specify.

- ☐ No, the information was provided based on what was available within my department
- ☐ No, the information used to answer the survey is shared among departments and was readily available
- ☐ Yes. Please provide the department:

54. Would you like to receive a report comparing your organization's level of readiness with that of other respondents in the same size category, in an aggregated format and after all the data is compiled?

- ☐ No
- ☐ Yes. Please leave your e-mail here_____

Published by
The Centre for Advancement of Trenchless Technology



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If you have questions or suggestions regarding this report, please send an e-mail to

asilvasc@uwaterloo.ca