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The Evolution of Municipal Asset Management Maturity in Canada: Surveying Mid-Sized Cities and Evaluating Federal and Provincial Policies to Spur Municipal Asset Management Practice

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Abstract

In today's global economy, Canada's cities play a key role in the country's economic growth and prosperity. They must build and maintain significant amounts of public infrastructure. However, the large and ever-growing national infrastructure deficit threatens to undermine the country's competitiveness and quality of life. Since the turn of the century, the federal and provincial governments have increased reinvestment in infrastructure and employed several policy approaches to spur municipalities towards formalized asset management (AM) practice, which is widely recognized as the optimal means for determining long-term maintenance and funding requirements. Given the varied policy approaches, the state of municipal AM maturity might also be expected to differ across the country. Large municipalities have generally progressed much further than small municipalities, whose resources are very limited. Less is known about mid-sized cities, however, where perhaps more variation can be expected.

Therefore, this paper surveys the current AM maturity of mid-sized Canadian cities using the Federation of Canadian Municipalities AM Readiness Scale, finding that most respondents are in the early stages of AM practice, though BC and Ontario seem to be further ahead of other provinces. The paper also assesses the effectiveness of the federal and provincial policies, classifying them using Christopher Hood's NATO framework and finding that, while they produced some incremental progress towards AM practice, success was limited because they did not address the key challenges municipalities faced, such as the lack of internal capacity to develop AM practice. The paper concludes with a few observations and considerations for future policy-making in Canada's multi-level governance context.

Acknowledgments

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1 Introduction

Since the mid-1990s, Canada's economy has shifted from being resource-driven to services-focused. At the same time, Canada has also become highly urbanized. In fact, urban areas now play a central role in Canada's growth and prosperity, accounting for more than 80 percent of its population and economic activity (TD Bank, 2002). Given their importance to global labour markets in an increasingly urbanized society, it is understandable that the affairs of large cities have received the most attention from city-builders, planners and researchers. Various issues, such as inner-city poverty, homelessness, affordable housing, urban sprawl, traffic congestion, and transit have typically been discussed in a big city context (Flatt, 2018; TD Bank, 2002). In contrast though, mid-sized cities – defined later herein as those with populations between 50,000 and 500,000 – have received very little attention from researchers nor benefited from dedicated policy study (Bunting et al., 2007; Flatt, 2018).

For example, in recent years the federal and provincial governments have focused on moving municipalities towards formal asset management (AM) practice as an important part of the strategy to address Canada's looming national infrastructure deficit, the value of which has recently been estimated to be between $150 billion and $1 trillion (International Institute for Sustainable Development (IISD), 2021; George and Sekine, 2017). However, they have used several different approaches (or policies), as will be described further herein, such that progress towards AM maturity has not been consistent across and within provinces. In addition, as reported in the Canadian Infrastructure Report Cards (CIRCs), large municipalities have generally progressed much further towards AM maturity than small towns and rural municipalities, whose resources are very limited (CIRC, 2016; CIRC, 2019). But less is known

about the status of AM maturity in mid-sized cities, which can be considered a more complex category and where perhaps the most variation might be expected. Mid-sized cities typically have more resources than small towns and rural municipalities but fewer resources than large cities. They are sometimes well-positioned as innovation and sustainability leaders, particularly if they are growing and close to major urban centres, and provide more place-based diversity in the urban experience they can offer. Yet, they are often challenged to: 1) support an array of services similar to those larger cities offer; 2) maintain sizeable amounts of infrastructure constructed throughout decades of suburban sprawl; 3) address downtown revitalization needs; and, 4) attract and retain talent (Flatt, 2018; Jamal, 2018).

1.1 Purpose and Outline of the Paper

In light of the foregoing, this paper has two main objectives: 1) it attempts to survey the current AM maturity level of mid-sized Canadian cities; and, 2) it attempts to assess which federal and provincial approaches/policies have been the most effective in spurring municipalities towards AM maturity. Specifically, the paper focuses on the period from the early 2000s to the present. Note that for a few practical reasons, the research did not include the territories and the province of Quebec; any general references to “provinces” or similar language throughout the paper should be interpreted in the same manner.

What follows is divided into eight sections, starting with Section 2, which sets the stage by briefly discussing what the infrastructure deficit is, what caused it, and why it has become a central issue for Canadian municipalities. Section 3 recaps the municipal adoption of accrual accounting, which took place in 2009 and was seen by the senior levels of government as an

important first step in beginning to address the infrastructure deficit and in moving towards AM practice. Section 4 presents the origins of AM practice in the public sector and briefly describes its concepts. Section 5 outlines the evolution towards AM practice that has been occurring in Canada over the past two decades, both before, but mostly after the 2009 switch to municipal accrual accounting. To help frame that discussion, the paper draws from the literature on policy systems and instruments in a multi-level governance context and applies Christopher Hood's NATO model to classify the approaches taken by the federal and provincial governments to spur municipalities towards AM maturity. Turning to the research undertaken for the paper, Section 6 describes the methodology used to survey mid-sized municipalities, including the use of the Federation of Canadian Municipalities (FCM) AM Readiness Scale as a basis for comparing AM maturity. Section 7 presents the survey results. Section 8 then analyzes them and assesses the relative effectiveness of the various policy approaches taken by the senior levels of government to spur municipalities towards AM practice. Section 9, the final section, summarizes the main conclusions and briefly discusses a few observations and considerations for future federal and/or provincial policy-making in Canada's multi-level governance context.

2 Setting the Stage – the Growing Infrastructure Deficit

As mentioned in the Introduction, cities play an important role in Canada's economic growth and prosperity. For the country to compete globally in the "new," knowledge-based economy, it is critical for Canadian cities to be able to attract and retain educated, innovative, and skilled workers, who often choose where to live and work based on the quality of life the community can offer. To provide a high quality of life, cities must be able to deliver world-class

services, such as recreation and cultural opportunities, attractive and safe neighbourhoods, efficient transit systems, and well-maintained infrastructure (FCM, 2006; TD Bank, 2002). Not only do these services contribute to quality of life for residents and attract skilled individuals and businesses, they also provide positive economic externalities regionally, provincially, and even nationally or internationally (Cameron, 2004; Cannon, 2008; FCM, 2006).

In order to provide the services they do, cities must build and maintain significant amounts of public infrastructure. This is no small task. Municipalities own and maintain more than 60 percent of Canada's core public infrastructure, yet have the fewest revenue sources available to them, compared to the provincial and federal levels. For example, municipalities received only eight cents of every tax dollar in 2006, compared to the federal and provincial governments, which received 50 cents and 42 cents, respectively (CIRC, 2016; FCM, 2006). Nationwide, downloading of service responsibilities from senior levels of government (sometimes without corresponding increases in funding transfers), combined with decades of municipal underinvestment due to this fiscal imbalance, have contributed to a significant, growing infrastructure deficit (or gap) – the difference between the funding currently allocated for infrastructure work and what is needed to restore a state of good repair and to build for future needs. In general, "the federal government has the money, the provincial governments have the constitutional authority, and local governments have the responsibility for making the actual investments" (Mackenzie, 2013).

The infrastructure deficit compromises Canada's competitiveness, negatively affects quality of life, and hampers efforts to attract and retain educated and skilled professionals (FCM, 2006; George and Sekine, 2017). Estimates of its value vary widely, but ranged from

$110 to $270 billion in 2018 and, more recently, from $150 billion to $1 trillion (in 2021) (Boston Consulting Group, 2018; IISD, 2021).

Though the gap has been evident (and growing) since the late 1970s or early 1980s, there has been increased attention and alarm-sounding since the late 1990s and the turn of the century (Mackenzie, 2013). Throughout the early 2000s, when the size of the infrastructure deficit was not well understood or quantified, numerous media stories, journal articles, and think tank studies and reports highlighted the problem (for example, see Cameron, 2004; Cannon, 2008; CIRC, 2016; FCM, 2006; Kitchen and Slack, 2003; Mackenzie, 2013; Murphy, 2008). Various ideas to address the infrastructure deficit (and the fiscal imbalance) were put forward. For example, Harry Kitchen and Enid Slack argued that municipalities should be given the authority to levy a wider range of taxes, such as hotel and motel occupancy taxes, and set their own rates. However, they noted that this might not work for smaller municipalities if they could not gather enough revenue from those additional sources, in which case appropriate transfers from the senior levels of government would still be important (2003). Murphy argued for the increased use of public-private partnerships, suggesting that this method of delivering public infrastructure could provide value in certain circumstances (2008). The FCM concluded that a rebalancing of the fiscal relationship amongst the three levels of government was needed and that municipalities should be given access to more revenue sources (2006). As a final example, Hugh Mackenzie, an economist writing for the Canadian Centre for Policy Alternatives, recommended that provincial governments should allow more direct financial arrangements between the federal governments and municipalities and that a more reliable

and dependable cost-sharing system should be established to replace the "ad hoc on-again, off-again non-system" that was in place at the time (2013).

In response to the alarm-raising, the federal government did increase spending on core infrastructure reinvestment through a number of programs/streams, from $600 million annually in 2004 to $5.5 billion by 2015 (Infrastructure Canada (IC), 2018). For example, it initiated the Gas Tax Fund (GTF) ($11.8 billion over seven years) in 2005 and the Infrastructure Stimulus Fund ($4 billion) in 2009 (IC, 2013). However, along with the understanding that more reinvestment was required came the realization that fiscal sustainability was the ultimate goal and that municipalities needed better tools and practices for determining long-term infrastructure maintenance and funding requirements (FCM, 2006). For example, local governments had never been required to inventory, track, or report the value of their capital assets, which contributed to the difficulty in estimating the size of the infrastructure gap (Shute, 2007). Thus, the stage was set for one of the first significant policy steps to be taken at the municipal level – the adoption of accrual accounting in 2009, which included the requirement to record tangible capital asset (TCA) information in annual financial statements (also known as TCA reporting).

3 The Adoption of Municipal Accrual Accounting

Before briefly recounting the municipal adoption of accrual accounting in 2009, it will be helpful to understand the context surrounding its adoption in the broader public sector. The federal government and many provinces, in fact, had already adopted accrual accounting by 2003 (Buhr, 2012). The switch from cash-based to accrual accounting seems to have been

driven by New Public Management (NPM) philosophies and "managerialism" that brought private sector practices to the public sector, starting in the 1980s (Becker et al., 2014; Buhr, 2012; Pina and Torres, 2003). NPM reforms sought to "enhance the efficiency, effectiveness, and accountability of public service delivery" and emphasized performance measurement and reporting (Buhr, 2012; Pina and Torres, 2003). There were several factors driving the desire for reform: the growing size of the public sector, increasing levels of taxation, the increasing cost of government and government debt, and a declining standard of living. NPM reformers viewed accrual accounting positively because it was associated with private business management methods, whereas public sector administrative practices were perceived as being outdated (Buhr, 2012).

Specifically, cash-based accounting was seen to have a number of disadvantages when viewed through the lens of government accountability and transparency. Chief among them was the fact that governments were not maintaining comprehensive and updated records of the value of their assets and liabilities (Cavanagh et al., 2016). This was because the cost of an asset was only recorded once, in the year in which it was acquired or constructed, instead of being spread over the number of years it was expected to be in service. After the year of purchase or construction, the asset would no longer appear in the accounting records. So, since municipalities had yet to adopt accrual accounting, they were not able to demonstrate the true value of their capital assets nor the cost of maintaining them (Wray, 2007).

In contrast, the federal and provincial governments that had switched to accrual accounting had likely realized several advantages over cash-based accounting. First, including cash and non-cash flows in financial statements would have provided a more comprehensive

picture of the government's financial performance and its costs. Second, a greater focus would have been placed on the management of government assets and liabilities (the main area of interest for this paper). Third, by consolidating the financial reporting of agencies, ministries, and institutions under the government's control, a more complete understanding of the financial position of the broader public sector would have been gained. Fourth, the use of internationally accepted accounting standards would have improved the reliability and comparability of government financial data across jurisdictions (Cavanagh et al., 2016).

There were some criticisms of the use of accrual accounting in the public sector, however. For example, its detractors pointed out that it is tailored to for-profit businesses and less-meaningful for non-profit governments: it relates revenues to costs for the purpose of determining financial performance (that is, whether there is a profit or loss), yet in the public sector, there is no profit motive and tax revenues are raised simply to be spent on services provided by the government. It is not so much the cost of services that is the measure of performance, but rather the social outcomes supported by those services, as governments are responsible for much more than financial management, such as the socio-economic well-being of communities. Although the financial statements indicate the resources flowing in and out, they cannot identify whether the government achieved the expected results for the money spent. Thus, it was argued that accrual accounting could not provide true performance measurement as envisioned by NPM (Buhr, 2012; Van der Hoek, 2005).

Overall though, by the mid-2000s accrual accounting (and especially TCA reporting, specifically) was widely seen as a way to improve the reliability and comparability of government financial data and to more accurately estimate the municipal infrastructure deficit,

since the historical costs of assets would be captured. In 2006, the Public Sector Accounting Board (PSAB) of the Canadian Institute of Chartered Accountants (CICA) updated its "Section 3150 – Tangible Capital Assets" standard, which outlined methodology for reporting and amortizing (depreciating) TCAs in government financial statements. The provinces supported the initiative, making it mandatory for local governments to follow the PSAB standard beginning in 2009 (Betik, 2007).

Though the senior levels of government viewed the switch to accrual accounting as an important improvement for municipalities, they also acknowledged that TCA reporting – a backward-looking accounting methodology – was simply a first step towards (and an opportunity to begin to implement) formal AM practice – a more fulsome, multi-disciplinary, and forward-looking approach that would ultimately be necessary to achieve fiscal sustainability (Ratford, 2008; Shute, 2007; Wolters, 2006).

4 The Origins and Anatomy of Asset Management Practice

At a high level, formalized AM practice can be defined in a number of ways. For example, Ontario's Building Together Guide described it as…

> *…the process of making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The objective is to maximize benefits, manage risk, and provide satisfactory levels of service to the public in a sustainable manner. Asset management requires a thorough understanding of the characteristics and condition of infrastructure assets, as well as the service levels expected from them. It also involves setting strategic priorities to optimize decision-making about when and how to proceed with investments. Finally, it requires the development of a financial plan, which is the most critical step in putting the plan into action. (Ontario, 2012)*

The United States (US) Federal Highway Administration described it as…

> *…a systematic process of maintaining, upgrading, and operating physical assets cost effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. Thus asset management provides a framework for handling both short- and long-range planning. (US DOT, 1999)*

A more succinct summary of the overall goal of AM practice can be found in Canada's National Guide to Sustainable Municipal Infrastructure (known as the "InfraGuide"). It states that asset management is a "way of doing business" that "should help municipalities identify the right amount of money to be spent on the right things, at the right time" (FCM, 2022a).

Whichever way it is defined, AM is not new. For decades, it has been used globally in various sectors of private industry, such as real estate, property management, manufacturing, and finance (FCM, 2022a). However, it was not until the 1980s (perhaps as part of, or influenced by, the NPM movement) that AM began to be used in public sectors around the world in relation to physical assets. In the United Kingdom, the North Sea oil and gas industry adopted AM in the era following the Piper Alpha oil platform disaster and the 1980s oil price crash. In 1988, the US National Council on Public Works authored "Fragile Foundations: A Report on America's Public Works," which led to the adoption of federal AM policies that emphasized achieving a desired level of service for the lowest lifecycle cost. At about the same time, the public sector in Australia and New Zealand, faced with declining levels of service, escalating costs, and poor planning, published the first public sector "Total Asset Management Manual" in 1993 (Institute of Asset Management (IAM), 2015).

Since then, a number of AM organizations, approaches, standards, and models have also been developed internationally. A prime example is the Institute of Asset Management, established in 1994. Since its inception, and especially since 2002, the IAM has coordinated with

many other organizations around the world to develop and evolve the practice of AM and has initiated or produced many globally accepted documents to explain the discipline. It has also collaborated on the global convergence of AM thinking, including such notable developments as the publication of the Publicly Available Specification (PAS) 55 specification, the Global Forum on Asset Management and Maintenance's first edition of the Asset Management Landscape, and the International Organization for Standardization's (ISO) 55000 standards (IAM, 2015).

In addition to the international body of knowledge, several Canadian organizations have also developed AM practice and/or implementation guides. For example, the FCM and the National Research Council developed the InfraGuide in partnership with the federal government; the Municipal Finance Officers' Association (MFOA) developed an AM framework and roadmap in partnership with the Province of Ontario; and, Asset Management British Columbia (AMBC) developed a framework for BC municipalities (AMBC, 2022; FCM, 2022a; MFOA, 2022).

Though various standards and models may describe AM using differing frameworks and terminologies, the anatomy of the practice can usually be distilled into a few important elements: 1) organization-wide policies that set guiding principles and objectives; 2) strategies and processes that implement those policies in day-to-day organizational activities; and 3) the preparation of a formal Asset Management Plan (AMP). Similarly, the AMP will typically address the following key questions in one manner or another:

- What does the municipality have and where is it? (Asset inventory)
- What is it worth? (Costs/replacement rates)

- What is its condition and expected remaining service life? (Condition and life cycle analysis)
- What is the level of service expectation, what needs to be done, and when? (Capital and operating plans)
- How much will it cost and what is the acceptable level of risk? (Replacement costs)
- How does the municipality ensure long-term affordability and sustainability? (Short- and long-term financial plans based on the answers to the previous five questions) (FCM, 2022a)

In reviewing its anatomy, it is evident that AM practice goes well beyond the simple historical-cost-and-depreciation-based accounting perspective TCA reporting provides, looking forward into the future to enable more effective long-term planning for infrastructure. Asset management practice demands a paradigm shift in day-to-day business practices and requires a multi-disciplinary approach that involves collaboration between engineering, operations, finance, and many other divisions.

5 The Evolution towards Asset Management Practice

By 2023, Canadian municipalities will have been reporting on TCAs for 14 years. During this time, municipalities have certainly progressed in developing and refining their asset inventories and condition datasets, since creating inventories was a necessary step for TCA reporting (CIRC, 2012; CIRC, 2016; CIRC, 2019). The federal and provincial governments, along with various municipal and industry associations, have also focused on moving local governments towards AM practice (in fact, the federal government had been doing this even before the adoption of accrual accounting and TCA reporting). However, several different approaches (or policies) have been used, as will be described further herein. Before discussing the approaches the federal and provincial governments have employed to spur municipalities

towards AM practice, it will be helpful to adopt a policy categorization framework (referred to in literature as a policy instrument taxonomy).

5.1 Classifying Policy Instruments – the NATO Framework

Many classification systems have been developed by scholars to describe the policy tools commonly used by governments, such as "carrots, sticks, and sermons," "muscles and prayers," and "mandates, inducements, capacity-building, and system-changing" (see Bemelmans-Videc et al., 1998; Gormley, 1989; McDonnell and Elmore, 1987; respectively). Others have conceptualized policy instruments in less discrete ways. Mörth, for example, used the terms "soft law" (negotiated and collaborative) and "hard law" (command and control) (2004). Macdonald envisioned a continuum from self-regulation to direct government intervention, according to the degree of coercion imposed, arguing that less coercive instruments are generally more acceptable in liberal societies than more coercive ones (2001).

One of the most simple and well-known taxonomies is Christopher Hood's, which is used in this paper. Originally developed in 1986 and updated in 2007 to reflect the modern digital world, Hood's taxonomy classifies the nature of "statecraft" resources available to governments using the acronym NATO, meaning Nodality (information in their possession), Authority (their legal powers), Treasure (their money), and Organization (the formal organizations available to them) (Hood, 1986; Hood and Margetts, 2007). For example, governments can influence policy actors by withdrawing (or making available) information or money, by using their coercive powers to force certain activities, or by undertaking those activities themselves using their own personnel and expertise (Howlett et al., 2009). Table 1

provides a few instrument examples by category. Although the NATO framework offers a simple system of discrete classification, it should be noted that there is rarely a single best instrument for a given situation and multiple tools (a policy mix) will frequently be employed. Such choices are often influenced by the political situation, the culture, past use and experience with certain tools, and the fact that policy makers are not usually blessed with a tabula rasa. Rather, they are often taking action after a number of previous attempts to address an issue or solve a problem (Hogwood and Peters, 1983).

Table 1: Example Policy Instruments Using the NATO Scheme

Nodality	Authority	Treasure	Organization
Information collection and release	Command-and-control regulation	Grants and loans	Direct provision of goods and services and public enterprises
Advice and exhortation	Self-regulation	User charges	Use of family, community, and voluntary organizations
Advertising	Standard-setting and delegated regulation	Taxes and tax expenditures	Market creation
Commissions and inquiries	Advisory committees and consultations	Interest group creation and funding	Government reorganization

Source: Adapted from Figure 5.1 in Howlett et al., 2009.

5.2 The Shift from Command-and-control to Collaborative Multi-level Governance

Inter-governmental dynamics can present challenges for policy implementation in federal regimes and within systems of multi-level governance (Hooghe and Marks, 2003; Stoker, 1991). The constitutional autonomy of sub-national levels (in Canada, the provincial/territorial governments), combined with the possibility for different (and often opposing) political parties being in power at the provincial and federal levels, may result in

programs being implemented differently than intended (Peters, 2015). This inherent structural challenge could be viewed as a type of principal-agent problem, where the ideas and interests of the policy-maker (the principal) are not always aligned with those of the implementer (the agent), leading to policy failure or outcome distortion (Howlett et al., 2009).

Historically, governance in the federation of Canada has mostly been a top-down, command-and-control approach in which policy directives were set out and passed down from the federal and/or provincial levels. Municipalities are not recognized as an order of government and do not have any independent status in Canada's constitution; rather, they are "creatures of the province" whose authority and autonomy is solely derived from (and delegated by) provincial legislation. As a result, municipalities have traditionally "sat on the sidelines, either as the implementers of provincial policies or as silent partners in shifting federal priorities" (Taylor and Bradford, 2020).

However, cities have increasingly found their place on Canada's governing agenda since the turn of the century, with the focus on how they should be governed and what place municipalities should occupy in the multilevel governance structure. This shift is a result of globalization and the trend towards urbanization, which have brought an awareness of the importance of urban economies for national prosperity and a recognition that many social, economic, and environmental challenges are being experienced in urban areas, but have national impacts. These challenges are complicated and do not "fit comfortably within the constitutional jurisdiction or legal authority of any one level of government, and so cannot be solved by any single level of government alone." Therefore, urban governance has necessarily become multi-level, requiring federal-provincial-municipal collaboration and a balance between

local autonomy and national consistency in order to effectively address significant problems such as the infrastructure deficit (Taylor and Bradford, 2020).

Thus, since the early 2000s, both the federal and provincial governments have demonstrated increased willingness to experiment with and engage in "collaborative multi-level urban governance." For example, municipalities have benefited from increased fiscal support (typically via grants) from both the provincial and federal governments. Several provinces have given municipalities greater political recognition as a democratic and accountable order of government, entering into agreements with municipal associations that require the province to consult or seek approval from municipalities before taking actions that affect them. A number of provinces have also increased municipal authority and autonomy through amendments to legislation – for example, shifting from defining "express powers" to allowing broad "spheres of jurisdiction" and granting "natural person powers." Lastly, the federal government has taken a multi-level approach through federal-provincial/territorial agreements with municipal participation, such as the negotiated bilateral agreements with the provinces to administer the Trudeau government's $180 billion Investing in Canada Plan (described further in the next section) (Taylor and Bradford, 2020).

5.3 Federal Approaches to Spur Municipal Asset Management Practice

In response to the alarm-sounding about the growing infrastructure deficit, provinces, territories, and municipalities collectively doubled their investments between 2003 and 2013, from $14.5 billion to $29.5 billion. The federal government also increased spending on core infrastructure through various programs/streams, from $600 million annually in 2004 to $5.5

billion by 2015, adding another $95.6 billion by 2017 (Infrastructure Canada (IC), 2018). Simply increasing spending on infrastructure, while needed in light of the magnitude of the deficit, does not necessarily relate to improving AM practice. However, the federal government has taken other actions over the past two decades to spur municipalities towards AM practice.

In the first few years, it used a mix of approaches that can primarily be classified under the Organization (reorganization), Nodality (information, advice and exhortation) and Treasure (funding) categories. For example, in 2002, in what can be classified as both an Organization- and Treasure-based approach, the federal government established Infrastructure Canada as a stand-alone department for the primary purpose of administering funding contribution/transfer programs targeting provincial/territorial and municipal infrastructure and supporting AM capacity building (IC, 2013). It also joined forces with the National Research Council and FCM to fund the creation of the InfraGuide, which was published in 2005 (FCM, 2022a). The InfraGuide is a collection of resources, ranging from technical guides to strategic planning tools, to help better inform municipal staff and decision-makers in infrastructure management (FCM, 2022a).

One of the key, early funding transfer programs was the Gas Tax Fund (GTF), which was initiated by Paul Martin's Liberal government in 2005 as part of its "New Deal for Cities and Communities" and made permanent by the Conservatives in 2008 (Taylor and Bradford, 2020). Now called the Canada Community-Building Fund (CCBF) (since June, 2021), the federal government provides this funding annually to the provinces and territories, which in turn distribute the funding to their municipalities (typically through municipal associations) to support local infrastructure priorities. Municipalities can determine projects and activities based on local priorities within the general qualification criteria set out in the program

guidelines (IC, 2022a). There are 19 eligibility categories, including Capacity Building, under which projects to improve AM practice are supported. By 2013, Infrastructure Canada estimated that $71 million had been spent on Capacity Building projects. However, it is unclear how much of that amount was directly related to improving AM practice, since the category was broad and projects such as development of community sustainability plans, feasibility studies, and engineering studies were also eligible (IC, 2013).

In terms of policy instruments, for the first several years of the Gas Tax program the federal government approach was mainly through Treasure (to provide funding), with limited rules other than the eligibility criteria, maximum contribution share, and certain reporting requirements. Around 2013 however, with the introduction of the new 10-year (2014 to 2024) Building Canada Plan (BCP), which included a renewed GTF commitment, the government started to blend in a more Authority-based approach. It introduced obligations for provinces (and in many cases, by extension municipalities also) to demonstrate certain commitments and/or progress towards improving municipal AM practice as part of the GTF transfer legal agreements. As listed in Table 2, these commitments generally fell into one of two categories: provinces committed either to develop an “approach,” “framework,” “template,” “guideline,” and/or “system” to assist their municipalities in improving AM practice, or to ensure that municipalities themselves “made progress towards,” “developed, and/or implemented” AMPs in accordance with certain timelines set out within the span of the 10-year agreement. Further, in all cases, provinces were obligated to submit “Outcomes” reports to the federal government in 2018 and 2023, reporting how progress was being made in improving municipal planning and AM practice.

Table 2: 2014 to 2024 GTF Transfer Agreements - Municipal Asset Management Commitments and Obligations

	2014 to 2024 GTF Transfer Agreements - Municipal Asset Management Commitments and Obligations	
Province	**Provincial Commitment (to Federal Government)**	**Municipal Obligation (mandated by Province)**
Common to all Provinces	• Report on municipal AM progress in 2018 and 2023	
Alberta	• Parties to develop an "approach to AM planning" by end of 2015, but at minimum, municipalities to be required to develop an AMP within a "reasonable timeframe" and include a multi-year capital plan with projects funded through the GTF • The subsequent "approach" was mostly actions to be taken by Alberta to assist/support/train municipalities	• Prepare 3- and 5-year capital plans (was already a new requirement via an amendment to the Municipal Government Act)
British Columbia	• UBCM also a party to the agreement • Develop an AM framework within one year to guide municipalities in meeting their AM commitment (later aligned to the AMBC framework)	• Work to strengthen AM, in accordance with the approved framework • Establish a commitment to improve AM practice in 2018 • Complete AM baseline surveys in 2016 and 2022
Manitoba	• Originally, ensure municipalities "develop and/or implement" an AMP by March 31, 2018. Amended in 2019 to "work towards" the development... • AM planning goals to be established using a tiered approach, based on size of municipality	• Make progress toward development and implementation of formalized components of AM by March 31, 2018 • Report on progress and planning goals annually to the province, via an AM status report
New Brunswick	• Require municipalities to develop and submit a capital AM plan, including an asset inventory, condition data, and list of priorities • Provincial goal is to receive these plans from: 25% of municipalities by end of 2017, 50% by end of 2022, and 100% by end of 2027	• Prepare and submit a capital AM plan by July 31, 2018, in accordance with a list of minimum content requirements set out by the province
Newfoundland and Labrador	• Develop a template and/or guidelines for municipalities to use or adapt in making improvements to AM planning or developing AMPs	• Submit a 1-page questionnaire on progress of AM plan and any training completed
Nova Scotia	• Develop and implement an AM tracking and reporting system with municipalities, and provide training once in place • Require municipalities to submit a capital investment plan annually	• Demonstrate progress towards developing and/or implementing an AMP • Submit a 5-year capital investment plan annually
Ontario	• AMO and City of Toronto also parties to the agreement • Require municipalities to develop and implement an AMP by the end of 2016	• Develop and implement an AMP by the end of 2016 • Demonstrate AMPs are being used to guide planning and investment decisions
Prince Edward Island	• Require municipalities to develop and/or implement an AMP by March 31, 2018 • PEI plans to develop and implement a common AM tracking and reporting tool with municipalities • PEI expects to develop AMPs with its municipalities	• With assistance of the province, develop an AMP by March 31, 2018 • In the interim, submit a 5-year infrastructure plan annually
Saskatchewan	• Province to develop tiered AM goals, with more advanced goals for larger municipalities, in collaboration with municipal sector • Originally, ensure municipalities make progress towards developing and/or implementing an AMP by March 31, 2018. Amended in 2019, adding "continue to work towards" the approved tiered goals	• Make progress towards developing and/or implementing an AMP by by March 31, 2018 (requirements vary by tier/size) and continue to work towards the approved tiered goals • Complete baseline survey in 2016 and follow up survey in 2017

Source: Infrastructure Canada, 2022a; AMO, UBCM, and provincial government websites.

The shift towards a more authoritative policy direction may have been motivated by the release of the first Canadian Infrastructure Report Card (in 2012) and other reports that indicated the state of AM practice in Canada was poor and that supporting additional capacity at the municipal level was crucial (CIRC, 2012). The level of authority/coercion exercised was still relatively low/soft though, since there was not a consistent nationwide requirement; rather, Infrastructure Canada worked with each province to "develop a tailored requirement for asset management within each jurisdiction that takes into account that jurisdiction's specific capacities, planning needs, and long-term objectives" (IC, 2013). Indeed, a review of the federal-provincial GTF transfer agreements (see Table 2) reflects this tailoring; the provincial commitments range from quite general to more prescriptive, both in scope and in the associated timelines. In addition, the federal government demonstrated its willingness to work with individual provincial preferences by allowing municipal organizations in BC and Ontario (the Union of British Columbia Municipalities (UBCM) and the Association of Municipalities of Ontario (AMO), respectively) and the City of Toronto to be included as parties to the federal-provincial agreements.

More recently (in 2016), the federal government introduced another Treasure-based policy – the 12-year Investing in Canada Plan (ICP). Along with five new infrastructure funding streams, the ICP increased federal financial contribution to cost-shared municipal infrastructure projects and, notably, introduced a $50 million funding program specifically targeted for building municipal AM practice, called the Municipal Asset Management Program (MAMP). Though most of the ICP funding streams are administered in a similar manner to the BCP (through bilateral agreements with the provinces), the MAMP is administered by the FCM,

which can approve municipal applications directly, without the need for provincial involvement. Municipalities can apply for grants to fund AM initiatives and risk assessments, plans, policies and strategies, data collection and reporting, training and organizational development, and knowledge transfer, development and sharing (IC, 2018). To date, more than $54 million in funding has been approved through the MAMP program and the total program allocation was increased to more than $104 million (IC, 2022b).

In summary, over the past two decades the federal government has primarily used Nodality- and Treasure-based policy coupled with a collaborative multi-level governance approach to encourage municipalities to adopt AM practice. This is understandable, considering that it receives the lion's share (more than half) of the collective tax pie (FCM, 2006), yet is farthest removed from the local government level in terms of not having direct constitutional authority over municipalities (as the provinces do) nor the local knowledge they possess. Where the federal approach has trended towards Authority-based policy (as was the case for the new BCP), it was generally applied directly with the provinces but indirectly with municipalities (that is, requirements were established for the provinces to then pass on to municipalities, generally speaking). However, this approach was still applied softly, evidencing the desire for collaborative governance, since the federal-provincial agreements were bilaterally negotiated and the requirements consequently applied at the municipal level were varied by jurisdiction (province).

5.4 Provincial Approaches to Spur Municipal Asset Management Practice

In the early 2000s, beginning with the implementation of the 2005 federal gas tax transfer program (a Treasure-based approach), provincial governments partnered with the federal government and municipal associations in administering and flowing the funding to municipalities. As mentioned in the previous section however, prior to 2014 it is unclear to what degree those funds were directly used for AM improvement.

Towards the end of the first decade, provincial governments started to take more concrete and/or unilateral actions to spur municipalities towards AM. A first example relates to the adoption of TCA reporting in 2009. Although the PSAB produced the 3150 standard for TCA reporting, it did not actually have the statutory authority to force local governments to adopt it. It was still necessary for the provincial governments to support the initiative, given their statutory authority over municipalities, and they did so. In fact, the majority of provinces took an Authority-based approach, amending municipal legislation to include the requirement for annual financial statements to be prepared "in accordance with generally accepted accounting principles for local governments as recommended, from time to time, by the Public Sector Accounting Board of the Canadian Institute of Chartered Accountants" or similar language (for example, see the Ontario Municipal Act, 2001, SO 2001, c 25).

A few provinces also began to take Treasure- and/or Nodality-based approaches to partner with industry and municipal leaders in creating community of practice organizations or in publishing guidelines and other resources. For example, in 2008 the British Columbia (BC) Ministry of Municipal Affairs and Housing provided staff representation and financial support to

help create and oversee Asset Management BC (AMBC), an organization whose vision is to "learn, educate, share, develop and collaborate asset management best practices." AMBC has had a significant influence on the state of municipal AM practice in BC, providing a number of tools, resource documents, newsletters, and best practice guides, including the "Asset Management for Sustainable Service Delivery: A BC Framework" (AMBC, 2022)

An even stronger example is Ontario, where in 2011, the Liberal government announced its 10-year Building Together infrastructure plan and indicated that municipalities and other transfer payment partners seeking provincial capital funding would be required to publish a detailed AMP and show how their proposed projects fit within it. As part of the Building Together plan, the government provided funding to 350 small municipalities to assist with the preparation of AMPs (Ontario, 2011; Ontario, 2012). Soon after, in 2012 the Province then released the Building Together Guide (BTG) for Municipal Asset Management Plans. Reflecting the Province's view that TCA reporting had provided a foundation for improving AM practice (since municipalities had developed asset inventories), the BTG provided guidance for developing AMPs and asserted that comprehensive AMPs should guide investment decisions. Perhaps just as importantly, the BTG also signalled the intention to force wider adoption of AM practice and move towards "standardization and consistency in municipal asset management" (Ontario, 2012).

A few years later, as described in Section 5.3, the new federal 2014 to 2024 BCP introduced obligations for provinces to demonstrate various commitments towards improving municipal AM practice as part of the 10-year GTF transfer legal agreements. This meant that not only was the federal government taking a blended Authority- and Treasury-based approach

in relation to the provinces, it was essentially compelling them to do something similar with their municipalities also. However, as mentioned earlier, this approach was still applied softly by both levels of government; the federal-provincial agreements were bilaterally negotiated, and in turn, some provinces worked with municipal associations to administer the funding and/or develop the AM-related requirements to be written into the agreements or subsequently applied at the municipal level. Thus, as shown in Table 2, the provincial approach to the federal goal of improving municipal AM practice differed across the country, with some municipal requirements being fairly relaxed, reflecting local governments' limited capacity and varying state of AM practice in each province.

For example, in Alberta, BC, Newfoundland and Labrador (NL), and Prince Edward Island (PEI), the provincial governments generally committed to developing an AM approach, framework, tracking system, or similar tool(s) to assist municipalities in improving AM practice. However, the minimum requirements for municipalities varied by province. In Alberta, municipalities only had to prepare multi-year capital plans, which the Province was willing to assist with, reflecting a focus on smaller municipalities and the understanding that AM planning was well underway in many larger municipalities (Alberta, 2014). In BC, municipalities had to demonstrate a general commitment to improving AM practice and complete baseline surveys administered by the UBCM (UBCM, 2022). Out east, there were very minimal requirements for municipalities in NL, such as completing a brief AM questionnaire. In PEI, municipalities were required to develop an AMP by March 31, 2018, but similar to Alberta, the Province planned to assist and participate in the process (IC, 2022a).

In contrast, other provinces took a more prescriptive approach, generally requiring municipalities to demonstrate progress in, or complete, development and/or implementation of an AMP within a certain timeframe. For example, New Brunswick municipalities had to submit a capital AM plan by July 31, 2018, in accordance with a list of minimum content requirements set out by the Province; Manitoba and Saskatchewan municipalities had to demonstrate progress towards an AMP by March 31, 2018, with content requirements outlined in tiers, based on population size; and, Ontario municipalities had to develop and implement an AMP by December 31, 2016 (IC, 2022a; Saskatchewan, 2022a). The Ontario approach was the most demanding; this was likely because, as mentioned previously, through the 2011 Building Together infrastructure plan, the Province had already introduced the requirement for municipalities to develop AMPs in order to access funding transfers.

In the last eight years since the 2014 signing of the GTF transfer agreements, provincial governments have also increasingly taken Nodality- and Treasure-based approaches unilaterally (that is, without the federal government first initiating funding programs). This has mostly been through publishing AM-related guides and resources (or by advocating for third party resources and communities of practice) and by creating provincial funding programs for municipal AM capacity building. For example, BC promotes the use of AMBC's framework and offers an Infrastructure Planning Grant (up to $10,000) that can be used for AM capacity building projects (BC, 2022). Similarly, Alberta promotes the Infrastructure Asset Management Alberta (IAMA) community of practice and developed an AM handbook and toolkit with the Consulting Engineers of Alberta and a few other municipal partners (Alberta, 2022). Saskatchewan promotes the Asset Management Saskatchewan community of practice and provides a number

of resources on its website, including an AM Getting Started Guide and links to similar resources in other provinces (Saskatchewan, 2022b). Another example is New Brunswick, which created a Guide to Asset Management Planning for Local Governments and also refers to the FCM for municipalities seeking additional AM resources (New Brunswick, 2017).

As a final point of discussion in this section, the province of Ontario is notable. Like other provinces, it has taken a number of Nodality- and Treasure-based actions in recent years. However, it has also recently taken a unique and strongly Authority-based approach. Following up on the intentions it communicated in the Building Together Guide to force wider adoption and standardization of AM practice, the Province enacted legislation in 2017 to regulate AM requirements for Ontario municipalities. The "Asset Management Planning for Municipal Infrastructure Regulation" was detailed and prescriptive and required municipalities to take a number of steps to improve AM practice, phased from 2019 to 2024 (but recently amended to 2025). For example, by July 1, 2019 a formal AM policy had to be approved by Council, by July 1, 2022 AMPs for five core assets (roads, bridges and culverts, water, wastewater, and stormwater) had to be completed, and by July 1, 2024 AMPs for all assets must be completed (Ontario, 2022). The Province recognizes that it may be difficult for small municipalities to achieve compliance with the regulation and provides a number of resources, tips, and links on its website (for example, providing funding for and referencing training and toolkits offered by the AMO and the Municipal Finance Officers' Association (MFOA)) (Ontario, 2022). It remains to be seen how many municipalities will actually achieve full compliance with the regulation by 2025, but it seems possible that at the least, a fair amount of progress will be achieved towards the Province's goal of spurring and standardizing municipal AM practice.

To sum up, over the past two decades provincial policy approaches have been similar to those used by the federal government. That is, provincial governments have primarily used Nodality- and Treasure-based policy to encourage municipalities to adopt AM practice. The use of Authority to spur municipal action (primarily through the GTF transfers) has also been applied, though softly, mirroring the federal approach and the desire for collaborative multi-level governance. A notable exception, however, is Ontario's use of legislation to regulate a number of municipal AM requirements, which by nature is a strongly coercive approach.

6 Municipal Asset Management Survey – Methodology

As mentioned in the Introduction, one of the main goals of this paper is to attempt a cross-sectional survey of the current AM maturity level of mid-sized Canadian cities. Therefore, the first step was to select an instrument to measure AM maturity in a consistent manner. Several tools currently exist and are in use across Canada. However, the FCM AM Readiness Scale was chosen for this survey, since it is a fairly straightforward, check-box style tool that makes for relatively simple comparisons between municipalities. Further, it was assumed that most municipalities would already be familiar with it, as the FCM requires that it be submitted when applying for federal funding under the MAMP program. The Readiness Scale consists of five building blocks, called competency areas, which together embody mature AM practice and can be summarized as follows:

- **Policy and Governance**: putting in place AM policies and objectives, implementing them through a strategy and roadmap, and then monitoring progress over time.
- **People and Leadership**: setting up a cross-functional AM team with clear accountability and ensuring adequate resourcing and commitment from senior management and elected officials to advance AM.

- **Data and Information**: collecting and using asset data, performance data, and financial information to support AM planning and decision-making.
- **Planning and Decision-Making**: documenting and standardizing how the organization sets AM priorities, conducts capital and operations and maintenance planning, and decides on budgets.
- **Contribution to AM Practice**: supporting staff in AM training, sharing knowledge internally to communicate the benefits of AM, and sharing knowledge externally. (FCM, 2022b)

To measure maturity in each competency area, a progressive scale of five levels is used. Each level is further broken down into three outcome areas, which collectively describe certain milestones, from initial investigation of practices, to adoption, and eventually, to full integration of AM practices into daily business processes. Municipalities may choose to aim for higher levels in some competencies than others, though it should be noted that Level 4 is roughly aligned with the requirements of the ISO 55000 standard, which according to the FCM, is a "significant accomplishment." In order to consider a level completed, each of the three outcomes for that level must have been achieved (FCM, 2022b). For example, if Level 2 has been completed for two outcomes in a given competency area, but only Level 1 has been completed for the third, the overall rating for that competency area will be Level 1. The FCM AM Readiness Scale can be downloaded from FCM's website under the "Resources" page: https://fcm.ca/en/resources/mamp/tool-asset-management-readiness-scale. The Scale does not provide qualitative descriptors for each of the five levels, simply numbering them one through five (FCM, 2022b). Although focused more on AMPs rather than all AM practice areas, Statistics Canada has developed a useful labeling scheme that aligns to the FCM Scale, which will be used for this paper. Namely, the five maturity levels can be titled Level 1 – "Aware,"

Level 2 – “Developing,” Level 3 – “Competent,” Level 4 – “Optimizing,” and Level 5 – “Excellent” (Statistics Canada (StatsCan), 2022a).

Step two in developing the municipal AM survey was to define a “mid-sized” city, in terms of its population size, as there is currently not a uniform standard to do so. For example, Immigration Canada lists a “medium-sized city” as having a population between 100,000 and 1,000,000, while Statistics Canada states that “medium population centers” have populations between 30,000 and 99,999 and “mid-sized Census Metropolitan Areas” have populations between 225,000 and 500,000 (see Canada, 2022; StatsCan, 2022b). Another example is the Organisation for Economic Cooperation and Development (OECD), which defines “medium-size urban areas” as having a population between 200,000 and 500,000 (OECD, 2022).

In the last five or six years however, a few scholars and think tanks have defined mid-sized cities as having a population between 50,000 and 500,000. For example, Evergreen’s 2018 Mid-Sized Cities Research Series – a series of 10 discussion papers prepared by researchers from across Ontario – used this categorization, stating that it would represent 88 cities across Canada and 36.7 percent of the country’s population, based on the 2011 Census data (Evergreen, 2018). Simon Fraser University researchers also used the same categorization in an ongoing project studying the impacts of bicycle infrastructure in mid-sized cities, but stated it would represent about a third of all cities and as of 2016, about 8.3 million of the 35 million total national population (Simon Fraser University, 2022).

Accordingly, for this paper mid-sized cities were deemed to be either single-tier or lower-tier municipalities having a population between 50,000 and 500,000. Upper-tier

municipalities, such as regional municipalities and regional districts, were excluded. Applying this criteria to the 2021 Census data resulted in a potential pool of 66 mid-sized cities, together representing about 9 million (almost one quarter) of the approximately 37 million total national population (StatsCan, 2022c). However, the list was eventually pared down to 44 municipalities that could be contacted by email for the survey (as opposed to those who only allowed for electronic contact via character-limited online forms, which was not practical for the information that needed to be sent). Table 3 lists the pool of municipalities that were initially contacted via email. They were asked to provide a copy of their most recently completed FCM AM Readiness Scale, if available, and/or to provide any other important and publicly-available, related documents, such as a Council-approved AM policy or strategy, an AM roadmap, an AMP, or state of infrastructure report cards. (The intention was to infer/estimate Readiness Scale ratings using those documents, if needed).

The goal was to receive at least three responses in each province, except for those provinces where there are only one or two mid-sized cities located (for example, Manitoba, Nova Scotia, and Newfoundland and Labrador each have only one city with a population between 50,000 and 500,000; PEI has none). In total, 13 responses were received, representing a response rate of about 21 percent. In all 13 cases, a completed FCM Readiness Scale was provided. In provinces where an insufficient number of responses were received, additional FCM Readiness Scales were completed by the author using AM-related documents and information publicly available from municipal websites, where possible. Six Scales were completed by the author in this manner, bringing the number of municipalities assessed to 19 in total (representing approximately 43 percent of the possible total of 44). Per province, the

final tally of completed Readiness Scales was: five in BC, two in Alberta, two in Saskatchewan, one in Manitoba, five in Ontario, two in New Brunswick, one in Newfoundland and Labrador, and one in Nova Scotia. With a sample size of 19 cases (out of a possible 44), it cannot necessarily be assumed that the results are fully representative of all mid-sized cities, given the potential variation across the country. However, it can probably be assumed that they are reasonably representative at the provincial level, because the nature of municipal government (and specifically mid-sized cities in this case), in terms of the typical suite of services provided, financial means, political and jurisdictional authority, and other influencing factors is less likely to be highly variable within a given province, for the most part. Thus, the paper proceeded on this basis; to develop a more rigorous approach would have been beyond its scope.

Table 3: Municipalities Initially Contacted for the Survey

Province	Municipality	Population (2021)		Province	Municipality	Population (2021)
AB	Red Deer	100,844		NS	Halifax	439,819
AB	St. Albert	68,232		ON	Sault Ste. Marie	72,051
AB	Grande Prairie	64,141		ON	Chatham-Kent	103,988
BC	Victoria	91,867		ON	Oshawa	175,383
BC	Kelowna	144,576		ON	Windsor	229,660
BC	Abbotsford	153,524		ON	Greater Sudbury	166,004
BC	Chilliwack	93,203		ON	Burlington	186,948
BC	Prince George	76,708		ON	Oakville	213,759
BC	Burnaby	249,125		ON	Sarnia	72,047
BC	Delta	108,455		ON	London	422,324
BC	Maple Ridge	90,990		ON	Niagara Falls	94,415
BC	New Westminster	78,916		ON	North Bay	52,662
BC	North Vancouver	58,120		ON	Barrie	147,829
BC	Port Coquitlam	61,498		ON	Guelph	143,740
BC	Richmond	209,937		ON	Aurora	62,057
BC	Nanaimo	99,863		ON	Markham	338,503
BC	Kamloops	97,902		ON	Newmarket	87,942
MB	Brandon	51,313		ON	Richmond Hill	202,022
NB	Saint John	69,895		ON	Vaughan	323,103
NB	Moncton	79,470		ON	Waterloo	121,436
NB	Fredericton	63,116		SK	Regina	226,404
NL	St. John's	110,525		SK	Saskatoon	266,141

Source: StatsCan Table 98-10-0002-03 (https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810000203)

7 Municipal Asset Management Survey – Results

Given that the methods employed to encourage municipalities to adopt and mature AM practice have varied by province, the current state of municipal AM maturity can also likely be expected to differ across the country. Indeed, the results of the survey of mid-sized cities undertaken for this paper seem to support this assumption.

Table 4 presents the aggregated FCM Readiness Scale scores for all 19 municipalities. In accordance with the FCM guidance, the scores indicate the maximum readiness (or maturity) level completed in each of the five competencies areas. Note that "Working on L1" indicates that work on achieving Level 1 is underway but has not yet been completed and "Insufficient Info" was used for author-completed scales where a competency area could not be scored due to the information not being publicly available on the city's website. Table 4 is first presented here for reference; however, the results will be discussed in detail for each competency area in turn, since the Scale does not compute an overall rating and the FCM considers each competency area as a separate building block in AM practice. Notwithstanding, at the end of the section, an aggregated review will be briefly conducted to summarize the results.

Table 4: FCM Readiness Scale Levels Completed - All Cities

				FCM Readiness Scale Competency Area				
Province	City	Population (2021) *	Readiness Scale Source	Policy and Governance	People and Leadership	Data and Information	Planning and Decision-Making	Contribution to Asset Management Practice
AB	Grande Prairie	64,141	Author	Level 1	Level 1	Level 1	Level 1	Insufficient Info
AB	St. Albert	68,232	Municipality	Level 2	Level 2	Level 1	Level 1	Level 1
BC	Nanaimo	99,863	Municipality	Level 2	Level 1	Level 2	Level 3	Level 3
BC	New Westminster	78,916	Municipality	Level 2	Level 2	Level 1	Level 2	Level 2
BC	Port Coquitlam	61,498	Municipality	Level 1	Working on L1	Level 1	Level 1	Level 1
BC	Prince George	76,708	Municipality	Level 3	Level 3	Level 3	Level 2	Level 2
BC	Victoria	91,867	Municipality	Level 1	Level 2	Level 1	Level 2	Level 1
MB	Brandon	51,313	Author	Level 1	Working on L1	Level 1	Level 1	Insufficient Info
NB	Moncton	79,470	Municipality	Working on L1	Working on L1	Level 1	Level 2	Working on L1
NB	Saint John	69,895	Author	Level 1	Working on L1	Insufficient Info	Insufficient Info	Insufficient Info
NL	St. John's	110,525	Author	Level 1	Level 1	Level 1	Level 1	Level 1
NS	Halifax	439,819	Author	Working on L1	Level 1	Level 1	Level 1	Level 1
ON	Aurora	62,057	Municipality	Level 2	Level 2	Level 2	Level 2	Level 1
ON	Barrie	147,829	Municipality	Level 2	Level 3	Level 1	Level 2	Level 1
ON	Oshawa	175,383	Municipality	Level 2	Level 2	Level 1	Level 2	Level 1
ON	Sarnia	72,047	Municipality	Level 1	Level 2	Level 2	Level 2	Level 1
ON	Waterloo	121,436	Municipality	Level 2	Level 3	Level 2	Level 3	Level 3
SK	Regina	226,404	Municipality	Level 1	Level 1	Level 1	Level 1	Level 1
SK	Saskatoon	266,141	Author	Level 2	Level 1	Level 2	Level 2	Insufficient Info

* Source: StatsCan Table 98-10-0002-03 (https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810000203)

7.1 Policy and Governance Competency Area

As Figure 1 shows, most municipalities in the survey (84 percent) have achieved either Readiness Level 1 (Aware) or Level 2 (Developing) in the Policy and Governance competency area. Eight have completed Level 1 and eight have completed Level 2. At Level 1, the outcomes that would therefore have been achieved are:

1) **Policy and Objectives**: the city's senior management is committed to formalizing an AM program.
2) **Strategy and Roadmap**: the city has identified the benefits it wants from AM, and those benefits support organizational objectives.
3) **Measurement and Monitoring**: the city has identified short-term actions that will demonstrate early progress on AM. (FCM, 2022b)

At Level 2, the outcomes that would have been achieved include the following:

1) **Policy and Objectives**: the city has drafted an AM policy and it has been endorsed by senior management and council.
2) **Strategy and Roadmap**: the city has an AM strategy in place and a draft roadmap that outlines its approach for the next 1 to 3 years.

3) **Measurement and Monitoring**: the city is collecting baseline data on its current AM practices. (FCM, 2022b)

Considering that Level 4 (Optimizing) is roughly aligned with the ISO 55000 standard, Levels 1 and 2 represent fairly early steps on the road to AM maturity. At Level 1 (Aware), a municipality has really just started to develop a plan to implement formal AM practice. At Level 2 (Developing), it is in the process of getting its AM policy and strategy in place and has drafted a roadmap for short term progression. Once Level 3 (Competent) is reached, the municipality has started to implement its AM policy and roadmap. Thus, the Level 3 outcomes include the following:

1) **Policy and Objectives**: the city is starting to use its AM policy to guide its actions.
2) **Strategy and Roadmap**: the city's roadmap details the actions for implementing its AM strategy over the next 3 to 5 years.
3) **Measurement and Monitoring**: the city has established performance measures to monitor its AM progress, outcomes, and benefits to the community. (FCM, 2022b)

Only one city in the survey (Prince George, BC) has achieved Level 3 in the Policy and Governance competency area; none have achieved a higher level. Thus, the results indicate that most mid-sized cities are in the early stages of establishing and implementing AM policy and governance.

As shown in Figure 2, reviewing the results on a regional and/or provincial basis also reveals that Ontario and BC municipalities may be a little further ahead than the rest of the country in this competency area. For example, three of the five BC respondents and four of the five Ontario respondents have achieved at least Level 2. Conversely, the Atlantic Provinces may be a little further behind, with two of the four respondents working on Level 1 and two having

achieved Level 1. In the prairies and Alberta, the results vary, with three of the five respondents having achieved Level 1 and two having completed Level 2.

Figure 1: Policy and Governance Scores - All Cities

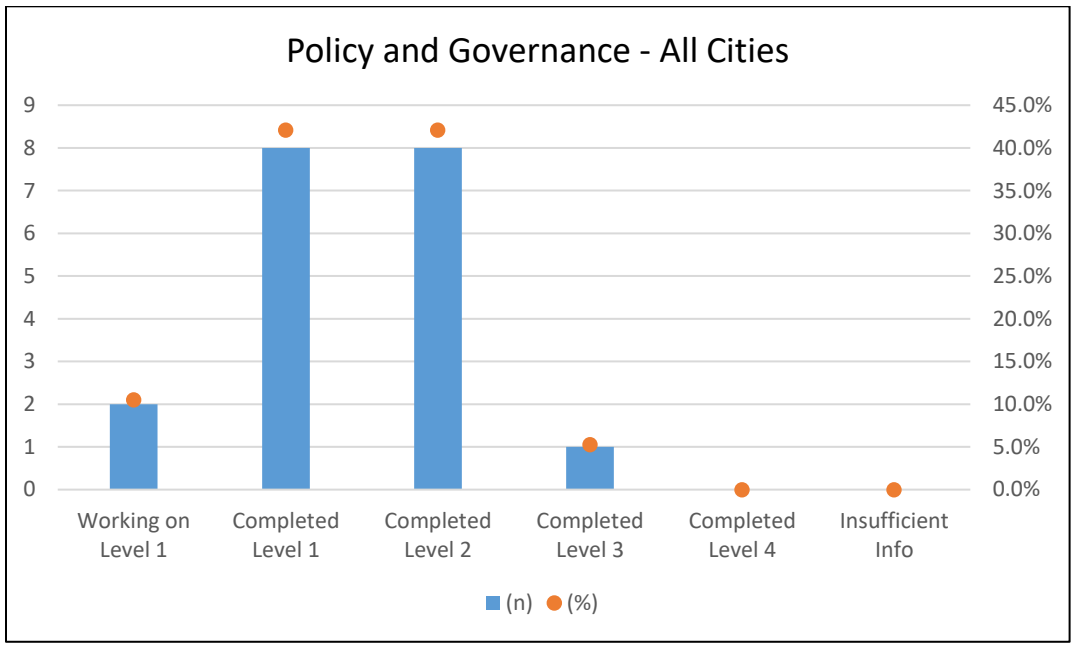
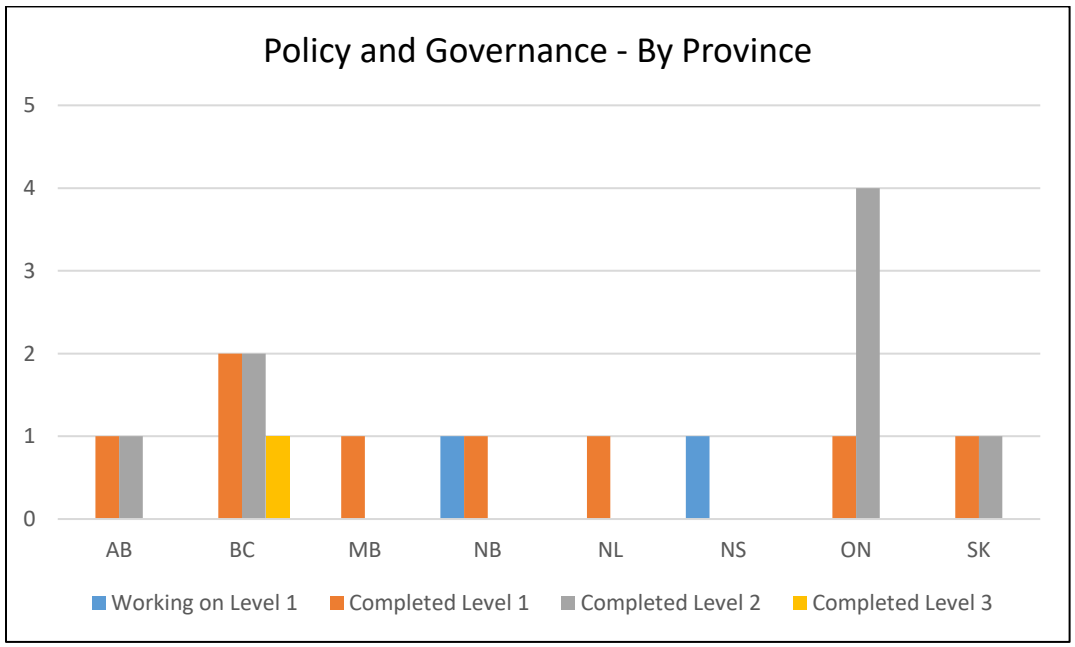


Figure 2: Policy and Governance Scores - By Province



7.2 People and Leadership Competency Area

The results in the People and Leadership category were more distributed than in the Policy and Governance category. Here, the majority of municipalities in the survey (64 percent) have achieved either Readiness Level 1 (Aware) or Level 2 (Developing); six have completed Level 1 and six have completed Level 2. However, four are still working on Level 1 and three have achieved Level 3 (Competent), as Figure 3 shows. At Level 1, the outcomes that would have been achieved are:

1) **Cross-Functional Teams**: the city has identified the representation needed on its cross-functional AM team.
2) **Accountability**: the city has a champion who has been tasked with planning for its AM program.
3) **Resourcing and Commitment**: the city's council knows that resources must be dedicated to exploring AM requirements and for drafting an AM roadmap. (FCM, 2022b)

At Level 2, the outcomes that would have been achieved include the following:

1) **Cross-Functional Teams**: the city has a cross-functional AM team that guides the planning and implementation of its AM program.
2) **Accountability**: the city's AM team has a documented mandate to develop the AM program, which is outlined in a terms of reference and a 1 to 3 year roadmap, and is accountable to senior management and council.
3) **Resourcing and Commitment**: the city's council demonstrates support for AM and allocates resources (funding or staff time) to further develop the AM program. (FCM, 2022b)

Similar to the first competency area, Level 1 and Level 2 results indicate that the majority of mid-sized cities are in the early stages for this competency area, in terms of setting up a cross-functional AM team with clear accountability and ensuring adequate resourcing and commitment from senior management and elected officials. Unlike the first competency area, however, more of the respondents are either further behind (still working on Level 1) or a little

further ahead, having completed the Level 3 outcomes. Once Level 3 is reached, the municipality has begun to make AM a core business practice, with clear leadership, accountability, and resourcing in place for continued progress. Accordingly, the Level 3 outcomes include the following:

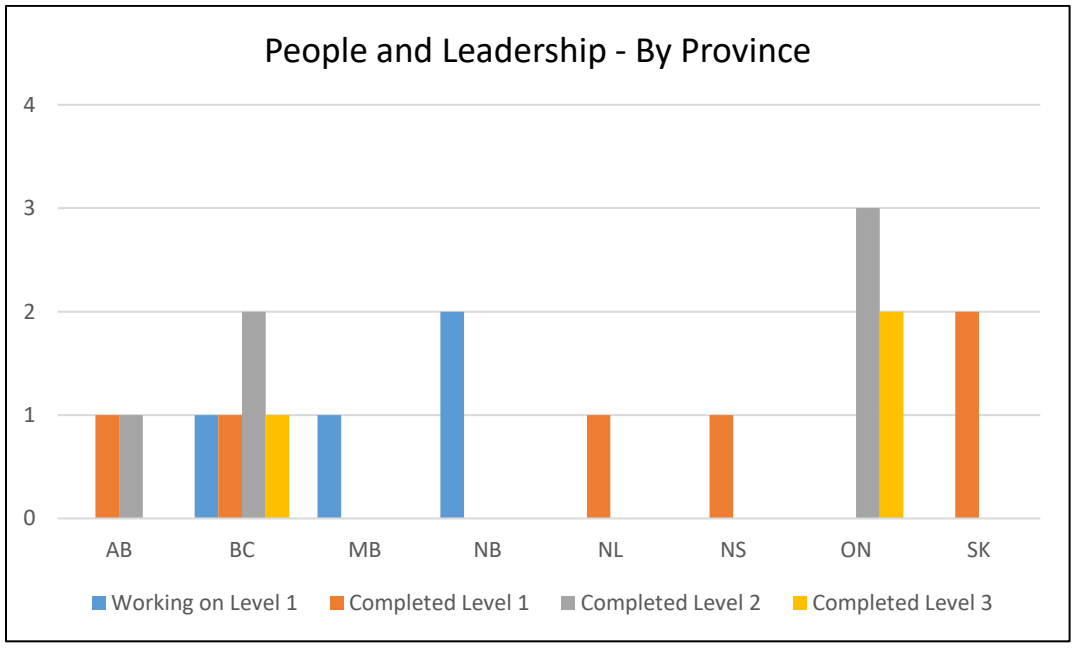
1) **Cross-Functional Teams**: the city's AM team works within the organization to lead, communicate, and support AM improvements and organizational changes.
2) **Accountability**: the city's AM team is accountable for implementing its AM program and AM roles and responsibilities are included in staff job descriptions.
3) **Resourcing and Commitment**: the city's council champions AM as a core business function and has approved funding to continue AM roadmap activities. (FCM, 2022b)

Only three cities in the survey (Prince George, BC, Barrie, ON, and Waterloo, ON) have achieved Level 3 in the People and Leadership competency area; none have achieved a higher level.

As shown in Figure 4, reviewing the People and Leadership results on a regional and/or provincial basis proves similar to the Policy and Governance competency area. Again, Ontario and BC municipalities may be a little further ahead than the rest of the country. Two of the five BC respondents and three of the five Ontario respondents have achieved at least Level 2, and all three cities to have achieved Level 3 are located in those provinces. Similarly, the Atlantic Provinces may be a little further behind, with two of the four cities working on Level 1 and two having completed Level 1. In the prairies and Alberta, the results vary, with three cities having achieved Level 1, one city working on Level 1, and one city having completed Level 2.

Figure 3: People and Leadership Scores - All Cities

Figure 4: People and Leadership Scores - By Province



7.3 Data and Information Competency Area

As Figure 5 shows, the results in the Data and Information category were more skewed, compared with the first two competency areas. In this area, almost two-thirds of municipalities

in the survey (12, or approximately 63 percent) have achieved Level 1 (Aware), five have completed Level 2 (Developing), and one has achieved Level 3 (Competent). At Level 1, the outcomes that would have been achieved include:

1) **Asset Data**: the city has asset inventory data, with approximate quantities of assets for most asset classes, some anecdotal information on asset condition, and some age information.
2) **Performance Data**: the city has an informal or anecdotal approach for measuring asset performance.
3) **Financial Information**: the city has financial information on its assets, supporting minimum PSAB 3150 reporting requirements. (FCM, 2022b)

At Level 2, the outcomes that would have been achieved are:

1) **Asset Data**: the city has a basic inventory of most critical assets, including properties such as size, material, location, and installation date; data is being moved to a centralized location for use by the AM team; critical assets have been defined and the city has some information on the condition of these assets.
2) **Performance Data**: the city has some information on the performance of critical assets, collected from a variety of sources.
3) **Financial Information**: the city has major capital renewal and operating & maintenance expenditure data for some assets, and a strategy to link AM and financial information. (FCM, 2022b)

Given a significant majority of mid-sized cities appear to have achieved Level 1, but only a few have completed Level 2, the results indicate that municipalities are in the early stages for this competency area, in terms of collection and use of AM data, performance data, and financial information to support effective AM practice and decision-making. Once Level 3 is reached, the municipality has started to be able to rely on robust asset data and use it understand asset performance, level of performance, and funding requirements. The Level 3 outcomes are as follows:

1) **Asset Data**: the city has a consolidated, basic inventory of all assets, defined life cycle investment needs for critical assets, standardized condition rating systems for most asset classes, and condition information for all critical assets.
2) **Performance Data**: the city has defined level of service measurement for some areas, captured data on current level of service performance for some areas, and reviewed service levels and asset performance with council.
3) **Financial Information**: the city has capital renewal and operating & maintenance expenditure data for most assets, has linked AM and financial information for all critical assets, and can demonstrate the gap between forecasted infrastructure needs and current spending levels. (FCM, 2022b)

Only one city in the survey (Prince George, BC) has achieved Level 3 in the Data and Information competency area; none have achieved a higher level.

As Figure 6 shows, reviewing the Data and Information results on a regional and/or provincial basis again reveals that Ontario and BC municipalities may be a little further ahead than the rest of the country. Two of the five BC respondents and three of the Ontario respondents have achieved Level 2 or above (as mentioned, Prince George has achieved Level 3). All of the mid-sized cities in the other provinces have only completed Level 1, with the exception of one municipality in Saskatchewan that has completed Level 2.

Figure 5: Data and Information Scores - All Cities

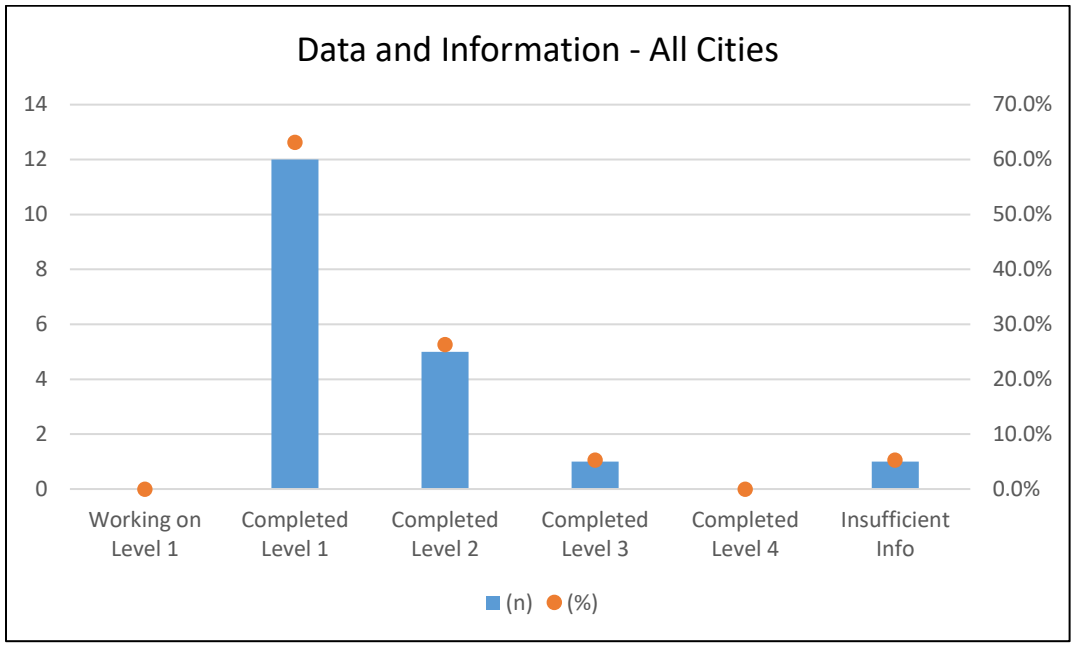
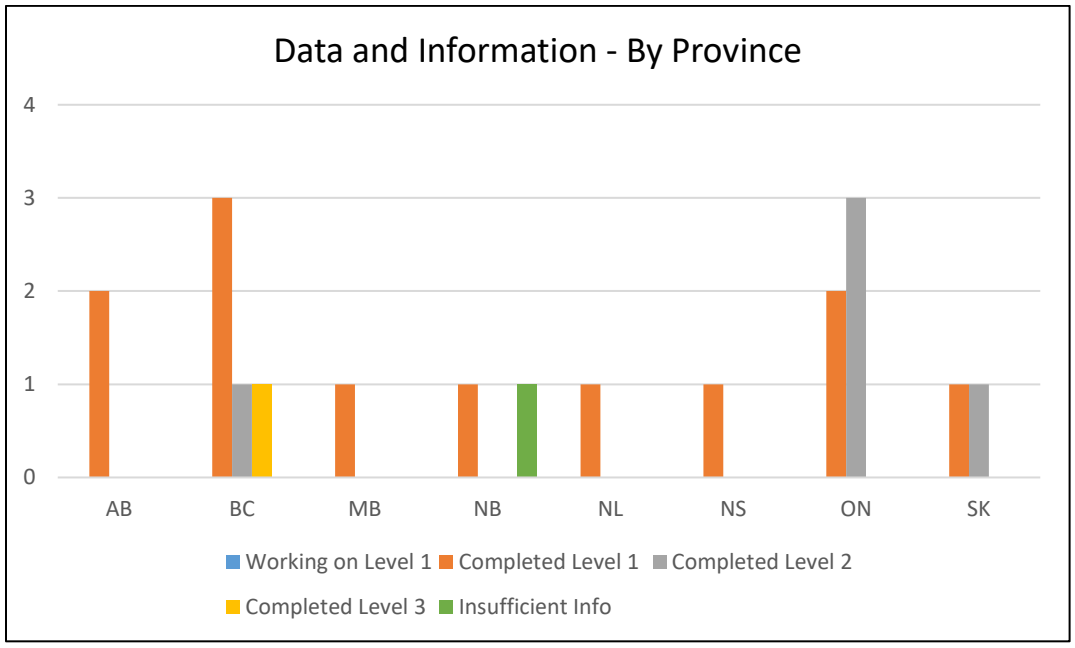


Figure 6: Data and information Scores - By Province



7.4 Planning and Decision-Making Competency Area

As Figure 7 demonstrates, the results in the Planning and Decision-Making category align fairly closely with those for the Policy and Governance area. In the Planning and Decision-

Making category, most municipalities in the survey (84 percent) have achieved either Readiness Level 1 (Aware) or Level 2 (Developing). In this case, seven have completed Level 1 and nine have completed Level 2. At Level 1, the outcomes that would have been achieved are:

1) **Documentation and Standardization**: the city's asset planning approaches vary across the organization.
2) **Asset Management Plans**: the city's approach to asset renewal focuses on reacting to basic needs and priorities are evaluated based on available information, staff experience, and input from council and management.
3) **Budgets and Financial Planning**: the city prepares annual capital and operating budgets based on historical values and deals with new needs reactively, as they occur. (FCM, 2022b)

At Level 2, the outcomes that would have been achieved include the following;

1) **Documentation and Standardization**: the city's departments follow a similar but informal asset planning approach; investment needs and priorities are evaluated based on a mix of structured and ad-hoc practices and criteria.
2) **Asset Management Plans**: the city has draft AM plans for some asset classes, with forecasted financial needs based on estimated data.
3) **Budgets and Financial Planning**: the city prepares annual capital and operating budgets based on a mix of historical values and new priorities. (FCM, 2022b)

As was the case for the previous competency areas, Level 1 and Level 2 results indicate that the majority of mid-sized cities are in the early stages for this category, in terms of documenting and standardizing how the organization sets AM priorities, undertakes capital and operational planning, and determines budgets. Once Level 3 (Competent) is reached, the municipality has begun to employ a more consistent and structured approach to asset planning and prioritization, as well to determining capital and operating budgets. Accordingly, the Level 3 outcomes for this category include the following:

1) **Documentation and Standardization**: the city has a structured, but sometimes inconsistently applied, asset planning approach and sets priorities based on organizational goals and objectives.

2) **Asset Management Plans**: the city has AM plans for critical services, based on a mix of estimated and actual data; the AM plans include some information on level of service and risk management; the AM plan identify short-term issues and priorities.
3) **Budgets and Financial Planning**: the city prepares an annual capital budget based on an annual assessment of current needs and a 3-year capital plan that addresses short-term issues and priorities. (FCM, 2022b)

Two cities in the survey (Nanaimo, BC, and Waterloo, ON) have achieved Level 3 in the Planning and Decision-Making competency area; none have achieved a higher level.

As shown in Figure 8, and as was the case for the previous competency areas, reviewing the results on a regional and/or provincial basis suggests that Ontario and BC municipalities may be a little further ahead than the rest of the country in this category also. Four of the five BC respondents and all five of the Ontario respondents have achieved Level 2 or above. Further, as mentioned, both cities to have achieved Level 3 are located in those provinces. All of the mid-sized cities in the other provinces have only completed Level 1, with one or two exceptions, such as a municipality in Saskatchewan that has completed Level 2.

Figure 7: Planning and Decision-Making Scores - All Cities

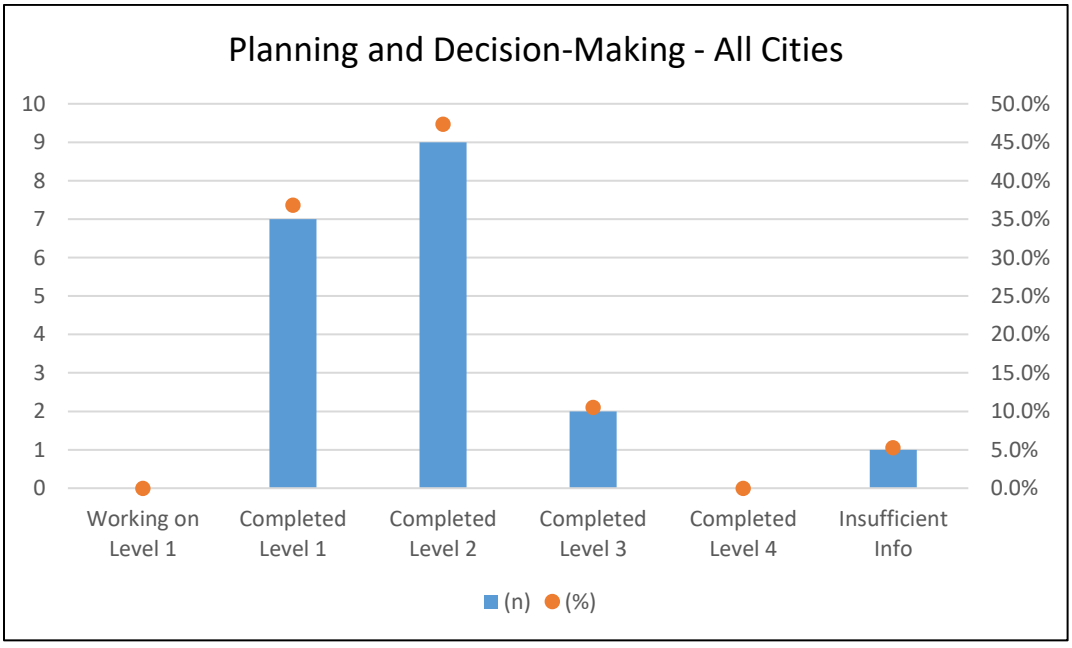
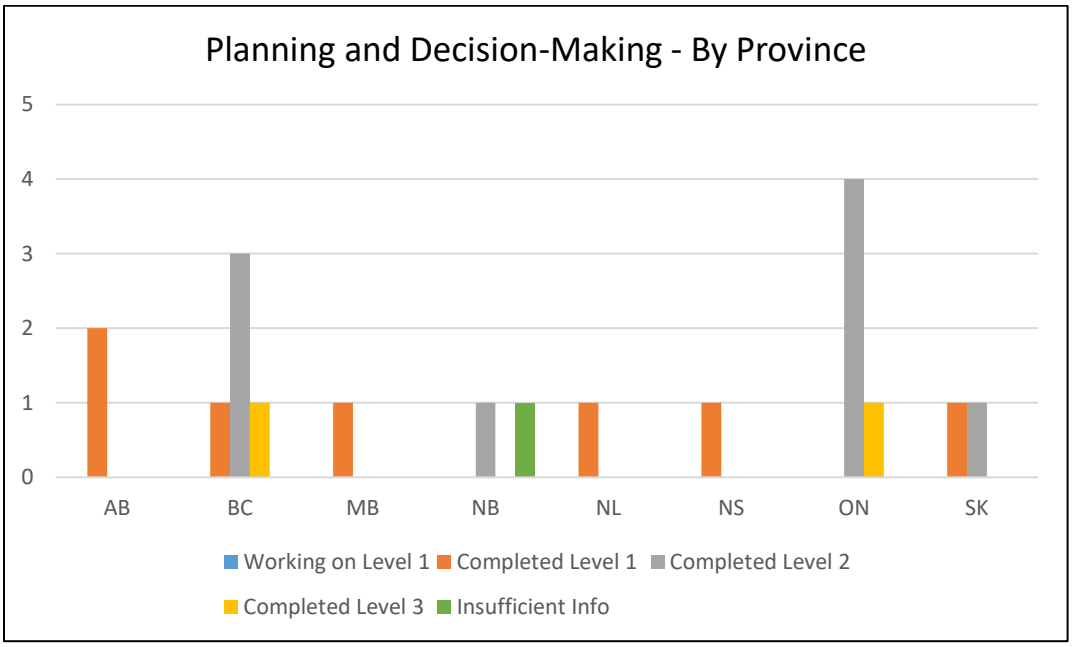


Figure 8: Planning and Decision-Making Scores - By Province



7.5 Contribution to AM Practice Competency Area

Given that the majority of scores for the previous four competency areas have been at Level 1 (Aware) or Level 2 (Developing), it is no surprise that the same trend can be seen in the final Readiness Scale category, Contribution to AM Practice. As Figure 9 shows, in this category 10 municipalities (or 53 percent) have achieved Level 1, with the remainder distributed between Working on Level 1 (one city), completed Level 2 (two cities), completed Level 3 (two cities), and Insufficient Info (four cities). The amount of cities for which insufficient information was noted is higher here than for the previous competency areas due to the nature of the category. Unlike formal documents such as AM policies, strategies, and plans, contribution to AM practice internally and externally may not be recorded in a formal manner or made publicly available and may exist primarily as internal organizational knowledge. For municipalities that have completed Level 1, the outcomes that would have been achieved are:

1) **Training and Development**: the city's AM training and development approach is informal and largely driven by staff's personal initiative; some staff conduct basic research on AM concepts and techniques.
2) **Internal Communication and Knowledge Sharing**: the city is aware of the need to mitigate the risk of losing information held in the minds of long-term staff.
3) **External Communication and Knowledge Sharing**: the city is investigating AM-related organizations and resources. (FCM, 2022b)

At Level 2, the outcomes that would have been achieved include the following:

1) **Training and Development**: the city's AM training and development needs are defined by management based on short-term needs; selected staff are trained on basic AM concepts; council has opportunities to increase their knowledge of AM.
2) **Internal Communication and Knowledge Sharing**: the city mitigates the risk of losing information held in the minds of long-term staff, through improved record-keeping.
3) **External Communication and Knowledge Sharing**: the city shares basic information on current capital projects with the public; staff or elected officials attend AM-related events. (FCM, 2022b)

It is understandable that most cities have completed only Level 1 (Aware) in this category. Results for the previous four categories have shown that most mid-sized cities' AM readiness is at Level 2 (Developing) or below, and sharing knowledge and contributing externally is not as integral to the development of AM maturity as are the other four competencies, which would generally be focused on first. Contributing to AM practice would therefore be something to develop later along the path to maturity, whether planned or as a result of the natural evolution and continuous improvement of the practice. For example, once Level 3 (Competent) is reached, the municipality has begun to embed AM training and development and knowledge sharing into the organizational culture. The Level 3 outcomes for this category are as follows:

1) **Training and Development**: the city provides all staff with basic AM awareness training and some undergo advance training specific to their roles; staff and council are able to communicate the value of AM in their own words.

2) **Internal Communication and Knowledge Sharing**: the city collects and maintains AM knowledge resources; a culture of knowledge sharing is emerging internally, and the benefits of AM are communicated to staff and council.
3) **External Communication and Knowledge Sharing**: the city is a member of one or more AM organizations and shares its experience; basic information on city assets, services provided, and future needs is shared with the public. (FCM, 2022b)

Two cities in the survey (Nanaimo, BC and Waterloo, ON) have achieved Level 3 in the Contribution to AM Practice competency area; none have achieved a higher level.

As shown in Figure 10, and unlike the previous four categories, reviewing the results on a regional and/or provincial basis suggests that the province of BC may be a little further ahead than the rest of the country in this category, but only slightly. Other than Waterloo, ON having completed Level 3, the only mid-sized cities to have completed Level 2 (two cities) or Level 3 (one city) hail from BC. The remainder of the country has only completed Level 1, which again, is unsurprising given the majority of cities have not scored higher than Level 2 in the previous four competency areas.

Figure 9: Contribution to AM Practice Scores - All Cities

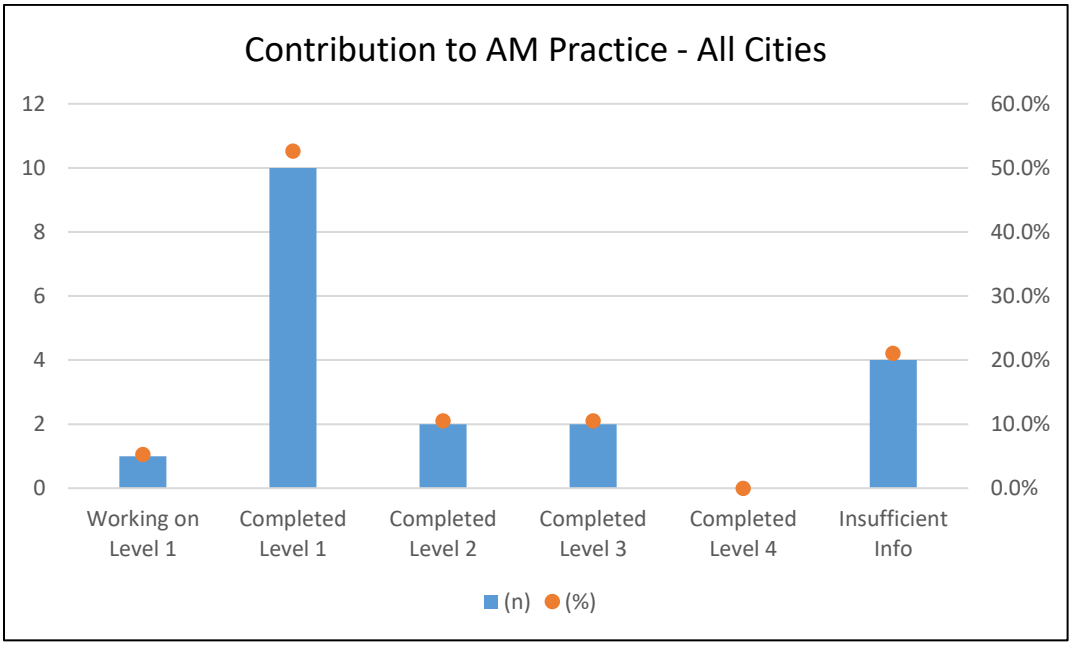
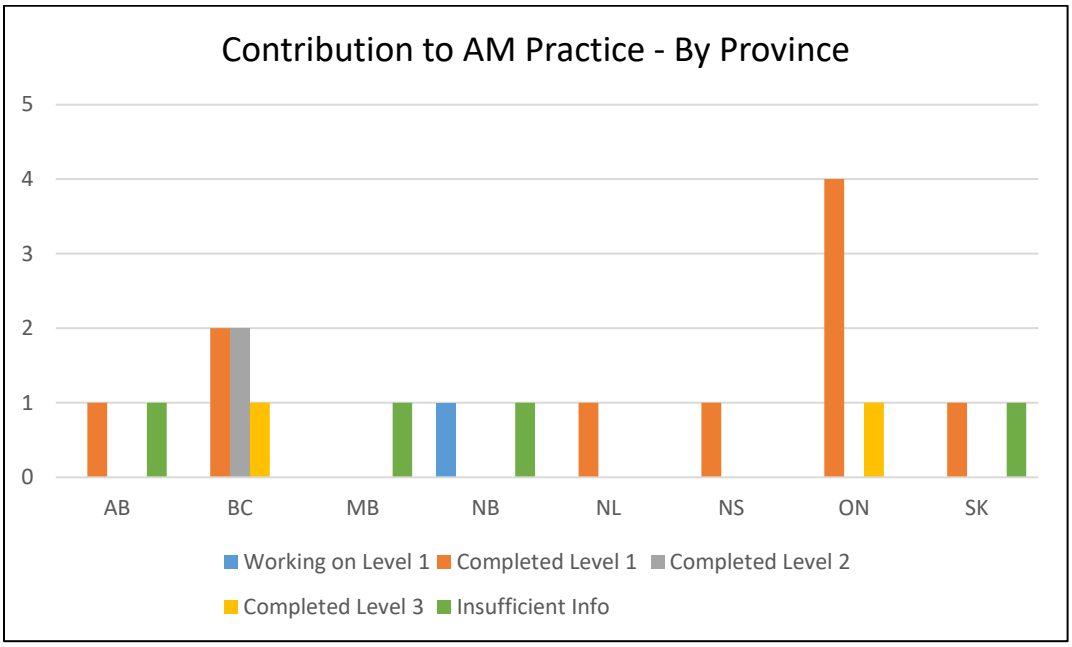


Figure 10: Contribution to AM Practice Scores - By Province

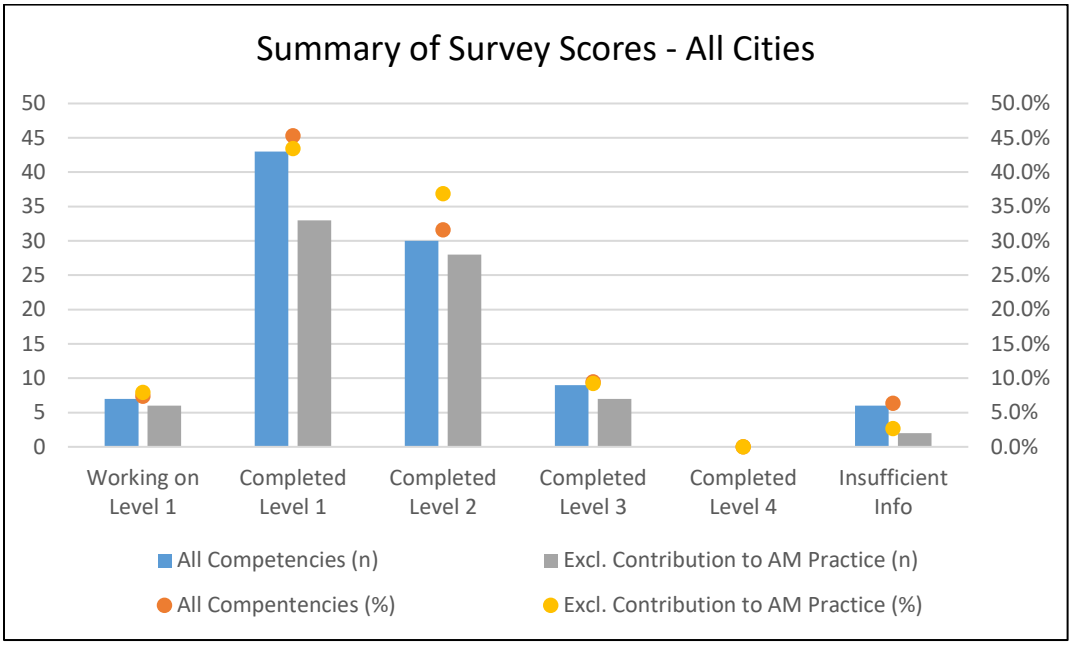


7.6 Summary of Results

Although the scores in the preceding sub-sections have been presented for each competency area and the FCM Readiness Scale does not compute an overall rating, it is still helpful for summary purposes to revisit the overall picture. As Figure 11 shows, the aggregated scores for the various competency areas (both including and excluding the last category, Contribution to AM Practice) suggest that the current level of AM maturity in mid-sized cities across Canada is relatively low. If the Contribution to AM Practice scores are excluded, approximately 80 percent of the scores across the four competencies indicate mid-sized cities have completed Level 1 (Aware) or Level 2 (Developing); only a handful have achieved Level 3 (Competent) and none have achieved Level 4 (Optimizing) or Level 5 (Excellent). Furthermore, there does not seem to be evidence of significantly greater progress being made in one or two competency areas, compared with the others; the majority of the scores in each of the five

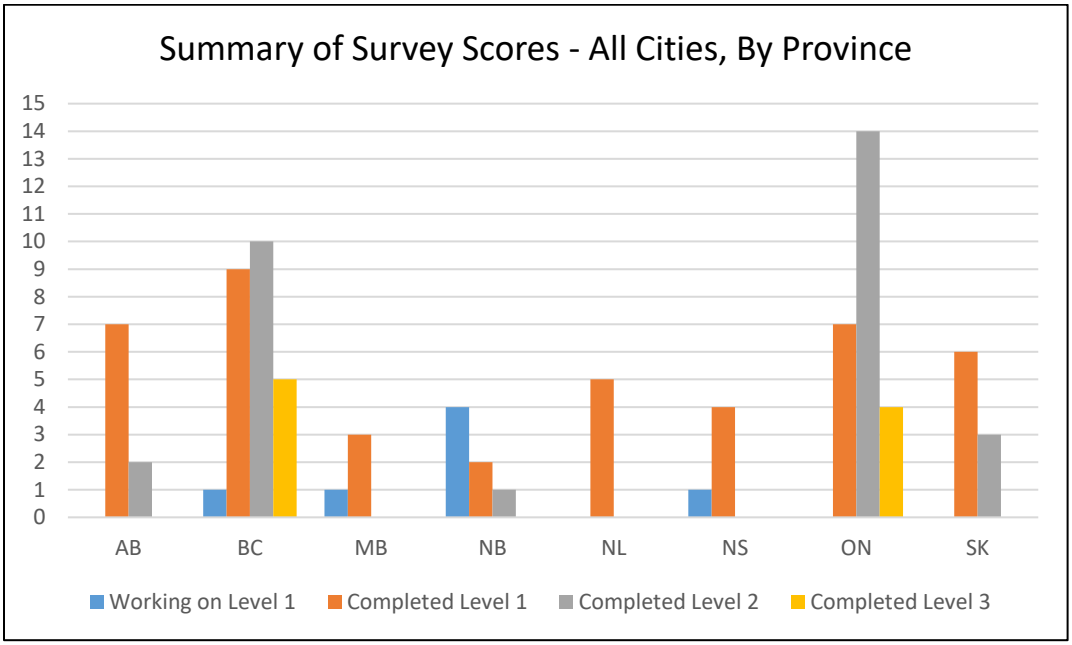
competency areas were consistently at Levels 1 and 2. As stated, these levels represent the relatively early stages of AM maturity, where municipalities are in the process of planning and adopting AM practices, but have not yet fully developed or integrated those practices into their day-to-day business processes (FCM, 2022b).

Figure 11: Summary of Survey Scores - All Cities



Finally, as Figure 12 shows, reviewing the aggregated scores on a regional and/or provincial basis paints a similar picture. Most mid-sized cities have completed either Level 1 or Level 2 in most competency areas, though the proportion of municipalities that have completed Level 2 is higher in BC and Ontario. Similarly, the only provinces in which some municipalities have completed Level 3 are BC and Ontario; none have completed Level 4 or higher.

Figure 12: Summary of Survey Scores - All Cities, By Province



8 Evaluating the Effectiveness of Federal and Provincial Policies

In this section, the paper will evaluate the effectiveness of the previously-presented federal and provincial policies to spur municipalities towards AM practice, based on published evidence from the past two decades and this paper's survey results. Similar to the approach taken in Section 5 (Evolution towards Asset Management), the discussion will proceed in a generally chronological manner through the first two decades. Following the analysis of the federal and provincial policies, the paper will also discuss several other factors that could have contributed to the current state of municipal AM maturity (apart from those policies).

8.1 The First Decade (Early 2000s up to about 2012)

To recap briefly from Section 5, in the early and mid-2000s, alongside growing concern about the national infrastructure deficit, the federal government started to apply Organization-, Nodality-, and Treasure-based policies/approaches in hopes of encouraging greater municipal

awareness and adoption of AM practice. For example, it created a dedicated infrastructure department (Infrastructure Canada), helped publish the InfraGuide, and instituted the GTF transfer program, which included eligibility for AM capacity projects. Later in the decade, the provinces began taking similar Nodality- and Treasure-based approaches, but also started to mix in Authority-based policies. For example, all provinces supported and mandated the switch to municipal accrual accounting/TCA reporting via the PSAB 3150 standard, which was seen as a first step towards AM practice, even though it was an accounting change. Some provinces (BC, for example) helped create an AM community of practice and began publishing their own guidelines and other resources (though most communities of practices in other provinces are managed and supported by volunteers, without direct financial support from the provincial government).

In the early years of the next decade (between 2010 and 2013), several studies and/or reports were published that revealed the state of municipal AM maturity had improved only a little through the 2000s. For instance, in 2010 AMBC partnered with the Province (and used funding from IC) to conduct a "snapshot" study on the state of AM in BC. Based on 150 interviews with staff from 39 local governments, the study determined that the majority of local governments in BC were in the "early stages" of AM (AMBC, 2010).

Another example is Ontario's Building Together Guide for Municipal Asset Management Plans. Published in 2012, it proclaimed that the transition to accrual accounting/TCA reporting was a first step in (and a foundation for) the development of AMPs and that many municipalities had made progress towards AM practice, but it also cited research indicating that less than 40 percent of Ontario municipalities had a long-term AMP in place (Ontario, 2012).

(For reference, completing draft AMPs for some asset classes is a Level 2 (Developing) outcome in the FCM AM Readiness Scale, Planning and Decision-Making competency area).

Nationally, there was also the first CIRC, which was released in 2012 and based on a survey of 123 municipalities across Canada. Although primarily concerned with assessing the state of roads and water, sewer, and stormwater infrastructure, it also touched on the state of AM in Canada. While the CIRC did highlight two larger cities – Edmonton, AB and Hamilton, ON – as early leaders in producing "state-of-the-infrastructure" reports, its overall finding was that the state of AM in Canada needed significant improvement. The report card noted that: many municipalities lacked the internal capacity to assess the state of their infrastructure on their own; more than 41 percent of municipalities had no data on the condition of their buried water distribution pipes (and more than 48 percent with respect to transmission pipes); and more than 41 percent did not have regular roadway condition assessment programs. The report card concluded that the "need to support additional capacity at the municipal level is a crucial finding of this report" (CIRC, 2012). (Again, for reference, the lack of condition assessment described in the 2012 CIRC would result in no higher than a Level 1 (Aware) rating in the FCM AM Readiness Scale).

In evaluating the effectiveness of federal and provincial policies in the 2000s to spur municipalities towards AM practice then, a general observation can be made that the primarily Organization-, Nodality-, and Treasure-based approaches seem to have had very limited success. Even the adoption of PSAB 1350 – an application of provincial Authority – did not move the needle very far towards AM, based on the afore-mentioned reports. Before discussing some possible reasons for this limited success though, it should be mentioned that were a few

positive effects – a few small stepping stones that started to overcome institutional inertia and laid the ground work for the policies of the next decade to come. For example, the creation of Infrastructure Canada, InfraGuide, and the GTF transfer program – all federal initiatives implemented in the first half of the decade – created an increasing national awareness of the infrastructure deficit and, to some degree, the need for AM. The adoption of PSAB 3150 in 2009 certainly created increased awareness of and support for AM practice amongst municipalities – at least at the staff level (AMBC, 2010; CIRC, 2012; Ontario, 2012). The federal and provincial involvement in fostering and developing communities of practice such as AMBC (in 2008) and the Canadian Network of Asset Managers (CNAM) (in 2009) also laid important ground work for the next decade, as community of practice groups would become increasingly active in promoting and supporting municipal AM practice.

Having said that, there are a number of possible reasons for the limited policy success through the 2000s (or prior to about 2012). First, while actions such as publishing the InfraGuide (Nodality), instituting the GTF transfer program (Treasure), and mandating PSAB 3150 (Authority) had helped raise local governments' awareness of AM and provided a basic picture of the state of their assets, there was still limited understanding of AM among elected officials and the public. Thus, long-term initiatives such as AM were challenged to compete with short-term political priorities on the public agenda (AMBC, 2010). Though still a Nodality-based approach, perhaps a more fulsome and wider-reaching education and awareness campaign might have helped.

Second, the federal and provincial policies/approaches did not adequately address the lack of internal capacity most municipalities were challenged with, especially small ones, which

found it difficult to justify and hire appropriate AM staff, whereas larger cities could better attract and finance those staff. Further, there were perceived affordability concerns that limited the ability to increase taxes and charges for financing AM (AMBC, 2010; CIRC, 2012; IC, 2013). While the GTF transfer program included some eligibility for capacity building, and although IC claimed to have spent more than $71 million on capacity building projects by 2013, the program was generally focused on project-based expenditures, such as engineering studies, feasibility studies, and community sustainability plans that municipalities would typically contract out to consultants (IC, 2013). Overhead and operating costs, such as staff salaries, were not eligible, so municipalities could not increase internal staff complements using the GTF program. The ineligibility of operating expenses might have been related to the fact the gas tax funding was not a permanent program, at least not until 2008. However, even the renewed GTF agreements (under the new Building Canada Plan in 2014, which are in force today) contained similar rules (IC, 2022a). It seems the federal government wanted the GTF to be primarily invested in direct costs of infrastructure renewal or construction projects. Similarly, the mandatory implementation of PSAB 3150 created a lot of work for municipalities (to inventory and determine the historical costs of their assets) but did not provide any resources to do so (Betik, 2007). Thus, most municipalities probably did only what they had to in order to meet the new accounting standard but did not make much progress towards AM practice beyond that, since there were no new internal resources or external pressures added for that purpose.

Third, notwithstanding the fact that communities (and thus their local governments) vary significantly across the country and that a localized approach to policy intervention would sometimes be optimal, in this case there was not a consistent approach taken to provide

municipalities clear guidelines and tools for implementing AM practice – for example, detailing what should be included in an AM strategy or AMP (AMBC, 2010; IC, 2013). Given that several AM guidelines and standards were in existence or being developed around the same time, plus the fact municipalities were already limited in capacity and lack of awareness was a challenge, a more centralized, structured approach with clear guidelines and tools may have been beneficial. A minor argument can also be made that, if the implementation of PSAB 3150 TCA reporting was thought to be a "tool" for kick-starting the implementation of AM practice, it was of limited effectiveness; it could only take things so far. As described earlier in the paper, TCA reporting is a backwards-looking accounting methodology that is of limited benefit to the forward-looking, multi-disciplinary approach that AM practice requires. Even the initial creation and historical valuation of asset inventories required by PSAB 3150 was problematic for some municipalities, who had incomplete or missing records due to the shift from paper drawings to digital data (AMBC, 2010).

8.2 The Second Decade (About 2012 to Present)

To recap briefly from Section 5 again, in the second decade the federal government continued to apply Treasure-based policies/approaches to spur municipal AM, such as the creation of the MAMP funding program in 2016. But it also started to mix in Authority-based, coercive approaches (though tempered with the desire for collaboration) beginning in 2014 with the new 10-year bilateral GTF transfer agreements with the provinces. For the most part, the provinces followed suit, passing on negotiated obligations for municipalities to demonstrate AM progress in order to access their share of the federal gas tax funding. Provincial governments also increasingly applied Nodality- and Treasure-based approaches of their own,

such as creating provincial AM capacity building funding programs and best practice guides. A notable exception, however, was the strong, Authority-based approach taken by the province of Ontario in 2017 when it enacted legislation to regulate certain AM practices for its municipalities, to be phased in from 2019 to 2025.

The main question for the second decade, then, is whether the increased use of Authority, mixed in with the existing Nodality- and Treasure-based approaches, was more effective in spurring municipalities towards AM. The answer is probably "yes, to some degree," especially in Ontario, but in the majority of the other provinces it is not a resounding answer. In other words, while AM awareness continued to grow and municipalities continued to make progress, most were (and still are today) in the early stages of AM maturity, generally at either Level 1 (Aware) or Level 2 (Developing). This statement is probably true of mid-sized cities, even more true of smaller municipalities, and less true of large cities. The survey conducted for this paper and several other reports published since 2016 support this conclusion.

For example, in 2016 the second CIRC was released, following up on the first one published in 2012. Similar to the 2012 CIRC, the 2016 report found that "all communities, particular smaller municipalities, would benefit from increased AM capacity." It also pointed to varied AM maturity according to community size, stating that 62 percent of large municipalities, 56 percent of medium-sized municipalities (defined as having a population between 30,000 and 100,000), and 35 percent of small municipalities had a formal AMP in place. Similarly, 63 percent of large municipalities, 56 percent of medium-sized municipalities, and 10 percent of small municipalities reported publishing a state of infrastructure report (CIRC, 2016). The Report Card also noted, however, that large municipalities were overrepresented in the study,

due to having more capacity to answer detailed survey questions on asset inventory, value, and condition (CIRC, 2016). It should also be noted that having a formal AMP in place does not indicate much about the type of information included, such as the quality level of the underlying data and the number of assets included. It also does not present a fulsome picture of the overall state of AM maturity, in terms of other competency areas, as expressed in the FCM Readiness Scale.

In addition to the national report card, there were a number of provincial baseline assessments completed in 2016, to support the Outcomes reports required by the GTF transfer agreements. For example, Saskatchewan's baseline survey found that 54 percent of its municipalities had "begun to implement" AM, but only 18 percent had staff trained in AM, only 14 percent had developed an AM policy, and only nine percent had developed an AM strategy (Saskatchewan, 2017). In BC, the UBCM baseline assessment results were similar, finding that the majority of municipalities were still in the early stages of AM. It indicated that 27 percent had developed formal AM processes, with another 27 percent currently doing so, 29 percent had created an AM policy, 29 percent had created an AM strategy, and 19 percent had completed at least one AMP. However, only 35 to 40 percent of those AM policies, strategies and AMPs were deemed to be competent to strong when compared to typical practices described by the AMBC Framework (UBCM, 2017).

Another example is the 2018 Investing in Canada Plan. In that document, Infrastructure Canada summed up the state of municipal AM practice in Canada:

> *As a relatively new discipline, asset management is not uniformly practiced across Canada. The Federation of Canadian Municipalities has noted that while there have been*

> *advancements in some Canadian municipalities and provinces, it is still* ***uncommon to find asset management effectively incorporated into strategic management systems****.* ***Many medium-sized municipalities and most small municipalities and Indigenous communities do not always have the necessary capacity to introduce asset management****. This challenge is even greater in Canada's smallest communities, some of which face high staff turn-over rates and limited access to training.* (Emphasis added) (IC, 2018)

Then, in 2019 the third (and most recent) CIRC was released. It was based on data collected by the Canadian Core Public Infrastructure Survey (CCPIS), a new program which had just been implemented by Statistics Canada and which generated much higher response rates than the previous CIRCs (the CCPIS is mandatory, whereas the CIRCs were voluntary). The 2019 Report Card showed incremental progress towards AM maturity, but mostly in large municipalities. It reported that AM capacity was growing, that there was increasing adoption in larger municipalities, and there was still a need to "continue supporting smaller municipalities with funding and technical support to adopt AM practices." In fact, it found that 70 percent of large municipalities now had a documented AMP (compared to 62 percent in the 2016 CIRC). However, only 29 percent of small municipalities (compared to 35 percent in the 2016 CIRC) and 56 percent of medium-sized municipalities (compared to 56 percent in the 2016 CIRC) had a documented AMP (CIRC, 2019). (The drop for small municipalities was likely due to the CCPIS capturing a far greater number of respondents than the 2016 CIRC had). Note that, similar to the 2016 CIRC, the above statistics should be qualified with the understanding that having an AMP in place does not necessarily speak to its level of rigour or quality, nor the overall state of AM maturity.

To reiterate then, the survey conducted for this paper and several other reports published since 2016 indicate that although AM awareness continued to grow and

municipalities continued to make progress since 2012, most were (and still are today) in the early stages of AM maturity, generally at either Level 1 (Aware) or Level 2 (Developing). Some of the reasons given (in the previous subsection) for the limited policy success through the 2000s likely also hold true for the period from 2012 to present. In particular, although awareness of AM practice increased, as the afore-mentioned reports have indicated, lack of internal capacity (especially for small and medium-sized municipalities) was likely still a significant challenge (CIRC, 2016; CIRC, 2019; IC, 2018).

Having said that, at least some of the incremental improvement that occurred can probably be attributed to the policy approaches taken by the federal and provincial governments since 2014. For example, the 2019 CIRC posited that AM capacity was in part being enhanced through the MAMP, which is an example of a federal Treasure-based approach (CIRC, 2019). In fact, the federal government recognized that increased support was needed for municipal AM capacity; in the 2019 federal budget, it increased funding for the program and extended it to 2024 (CIRC, 2019; IC, 2018). Perhaps the key difference between the MAMP and the early (pre-2014) versions of the GTF program, under which capacity building projects were eligible, was the increased focus and structure of the (policy) instrument itself. That is, while the GTF program eligibility was broad and municipalities could choose a number of different types of projects within that umbrella, the MAMP was specifically created to support AM capacity building projects, and requires applicants to provide completed pre- and post-project FCM AM Readiness Scales to demonstrate progress (FCM, 2022b).

Blending an Authority-based approach with the Treasure-based GTF program after 2014 has likely also contributed significantly to the incremental improvement in municipal AM

practice. Though the federal and provincial governments used a softer, collaborative approach with their respective subordinate levels of government to negotiate unique AM requirements in each GTF agreement, nonetheless municipalities in each province were still ultimately obligated to demonstrate progress towards AM practice in some manner or another in order to access their share of the gas tax funding. Furthermore, the paper's survey results seem to indicate that in Ontario, where the strongest example of an Authority-based approach (AM legislation) can be found, the most policy success (that is, progress towards AM maturity) has been seen since 2018 (when the legislation took force), at least for mid-sized cities. (But it may hold true for all community sizes, since the AM regulation applies to all ON municipalities).

8.3 Other Contributing Factors

Although it is beyond the scope of this paper to investigate in detail, it should be noted that there are likely other factors (apart from any shortcomings in the federal and provincial policy approaches) that have contributed to the limited success in moving municipalities towards formal AM practice over the past two decades. For example, governments are slow-moving by nature, so meaningful change takes time (except perhaps through a "focusing event" or a crisis, such as a national pandemic) (Peters, 2015). Thus, a greater degree of progress should perhaps not have been expected, especially prior to 2014, when the senior levels of government began to take a more Authority-based approach through the GTF transfer agreements. At that point, AM practice was still relatively new, TCA reporting had only been in place for five years, and the GTF program had only been made permanent six years earlier. For comparison, this is no longer than one or two municipal election cycles. Even the span of one or

two decades is not a relatively long period of time in the context of significant institutional change.

Another reason for the limited success could be that the path towards AM maturity is not linear. In other words, using the language of the FCM AM Readiness Scale, improving from Level 3 (Competent) to Level 4 (Optimizing) or from Level 2 (Developing) to Level 3 may be a bigger leap than moving from Level 1 (Aware) to Level 2. This may be particularly true of some competency areas more than others. For example, in the Data and Information category, fulfilling the outcomes for Level 1 can be largely achieved using information municipalities would already have gathered in order to meet the TCA reporting requirements. However, moving to Level 2 would require additional resource investment (time and money) to flesh out the asset datasets, and moving to Level 3 would require substantive changes to both data collection practices and organizational process linkages. Similarly, in the People and Leadership category, fulfilling the outcomes for Level 1 can generally be achieved by identifying an organizational AM champion and raising council's awareness, whereas moving to Level 2 would likely require the hiring of new staff to establish a dedicated, cross-functional AM team.

Furthermore, attaining a given level could be harder for some competency areas than others. For example, the lack of internal capacity has consistently been identified over the past two decades as a significant challenge for municipalities. Therefore, building on the previous illustration, hiring staff to fulfill the Level 2 cross-functional team requirements in the People and Leadership category could be more difficult than retaining a consultant to draft an AM roadmap, as required in Level 2 of the Policy and Governance area. (For example, recall that

GTF transfers can be used for capacity building project-related expenditures but not for full time staff salaries).

Economy of scale and/or demographic factors such as population size and geographic dispersion might also help explain why certain provinces seem to be further behind or ahead of their cohorts. For example, as mentioned previously, there are only a handful of mid-sized cities in most provinces, except for BC and Ontario, and even fewer in some of the less populous provinces, such as Saskatchewan, NL, and PEI. In fact, most of the municipalities in those provinces are small. Thus, progress towards AM maturity could in part be a matter of scale: fewer resources due to smaller tax bases, fewer cohort members amongst mid-sized and larger cities to share knowledge and raise the collective awareness, less infrastructure to maintain, and reduced complexity of services (fewer asset types), all of which may perhaps contribute to a reduced perception of the need for or benefits of formal AM practice. Similarly, scale-related factors could also affect the resources and activities of communities of practice and municipal associations. For example, BC and Ontario each have very active and well-resourced communities of practice and municipal associations. In contrast, there is only one community of practice for all four Atlantic provinces, the Atlantic Infrastructure Management Network (AIM), though each province does have its own municipal association(s).

Moving now to a more positive perspective, there are likely also some other factors (apart from the federal and provincial policy approaches) that have contributed to the incremental growth in AM maturity and awareness that has taken place over the past two decades. For example, the degree of advocacy, awareness, and resource-building activities of communities of practice and municipal associations has likely been significant in some cases.

This may be particularly true in BC, which based on the paper's survey results, seems to be the only other province that is roughly on par with Ontario's state of municipal AM practice, even though the provincial government has not employed a strong Authority-based approach such as Ontario did in legislating municipal AM practice. It is quite interesting that, in contrast with the rest of the country, BC municipalities seem to have achieved that status without the same degree of Authority-based intervention seen in Ontario.

As mentioned, one reason for this may be the strong leadership and advocacy of the provincial community of practice, AMBC. Since its creation in 2008, AMBC has been actively involved in bringing to life its strategic vision: AM outreach and awareness, education and capacity building, partner collaboration and engagement, and organizational development and resiliency. It maintains a website, publishes regular newsletters, delivers AM training and tools, and coordinates an annual conference (AMBC, 2022). For example, it created an "Asset Management Roadmap" and the best practice guide, "Asset Management for Sustainable Service Delivery: A BC Framework," that was adopted province-wide as a capacity building reference/tool for developing municipal requirements under the GTF agreement (UBCM, 2017).

In addition to the community of practice itself, the presence and influence of local champions (or policy entrepreneurs?) could have also contributed to the advancement of AM awareness and maturity in BC. For example, hailing from Nanaimo, the long-time executive director of AMBC, Wally Wells, was also involved with several national AM-building initiatives (such as the InfraGuide), and was honored with CNAM's 2019 Pioneer award for his leadership in building the AM profession in Canada (AMBC, 2022; CNAM, 2022).

In fairness though, it should be acknowledged that the province itself was a key partner in the creation of AMBC and continues to support its mandate, as described in Section 5.4. In fact this collaborative, rather than strictly authoritative approach, is indicative of the provincial government's historical attitude towards urban governance in BC. As Zack Taylor described in "Shaping the Metropolis," provincial policy-makers have generally refrained from direct application of Authority-based policy, preferring to maintain local autonomy as much as possible by supporting and encouraging inter-municipal collaboration and discouraging conflict, often behind the scenes. This pattern was established over decades through multiple inter-municipal and provincial-municipal collaborative efforts involved in creating regional governance institutions, such as water, sewer, and planning boards and districts in the Greater Vancouver (or Lower Mainland) area of BC. In fact, it started in the late nineteenth century when, unlike most other provinces, BC did not adopt a two-tier local government system; rather, it encouraged the creation of district municipalities that were similar to rural townships elsewhere, but left the choice to the discretion of local governments (Taylor, 2019).

Then, with rapid growth occurring in the Vancouver area in the early 1900s, water and sewer infrastructure financing and construction became a pressing concern. Working together, several local municipalities requested that the province authorize (through chartering legislation) the creation of the Vancouver and Districts Joint Sewerage and Drainage Board. The Board had the authority to raise funds on bond markets and was responsible for designing and constructing trunk sewers within its boundaries. Its board was comprised of delegates from the municipalities' councils, and operating costs were shared amongst the municipalities in proportion to the benefit each one received, which was determined by the assessed value of its

contributing drainage area. The same governance model was copied a few years later, when the Greater Vancouver Water District was created in 1924. It proved to be effective in fostering inter-municipal cooperation and negating any need for stronger provincial involvement, because it assigned costs, benefits, and representation to municipalities within its service area fairly and included mechanisms for adjustment over time, as needed. In 1949, following a similar collaborative process, the Lower Mainland Regional Planning Board was established. Later, in the late 1960s and early 1970s, following significant post-war population growth (and the corresponding need for coordinated planning and infrastructure expansion), some pundits called for a two-tier approach, as Ontario had taken with Metropolitan Toronto in the early 1950s. However, reinforcing the long-standing inter-municipal and provincial-municipal collaborative approach, the province consolidated a number of service boards into a system of regional districts (such as the Greater Vancouver Regional District (GVRD)), which had functional responsibilities for various services but rarely had to take authoritative actions that might have angered local municipalities or the province. Ironically, the GVRD changed its name to Metro Vancouver in 2007, but continues to plan and deliver regional-scale services in a collaborative manner to this day (Taylor, 2019).

Thus, to conclude this section, there are a few points of comparison that can be noted about the provincial-municipal governance approaches in BC and Ontario, whose municipalities seem to be leading the evolution towards AM practice in Canada. First, the fact that Ontario has taken a top-down, command-and-control policy approach is consistent with its history (which is a topic for another paper, but a quick scan of current news articles about Bill 23 or the recent 2018 municipal election in the City of Toronto will support this assertion). In contrast, BC has

taken a more bottom-up, multi-level collaborative approach that is also consistent with its history, as described above. Second, the fact that both provinces also seem to have actively supported municipalities with Nodality- and/or blended Treasure-based approaches that were more robust than those used in other provinces may have partially contributed to the improvement towards AM maturity. For example, when enacting its AM regulation, Ontario provided a detailed outline for various AMP requirements; it had also previously provided guidance on the same topic through publishing the Building Together Guide and partnering in the development of MFOA's 2018 AM Framework (MFOA, 2022). In BC, the province financially supported the creation of and continues to promote the activities of AMBC, which has been a significant support resource for BC municipalities.

A third and final point is that the motivations (or driving factors) behind the incremental AM progress that has been achieved may perhaps be different and potentially influenced by municipalities' views of and relationships with their respective provincial governments. Further, those motivations may ultimately help shape the degree to which progress is sustained. For example, based on a subordinate (and potentially slightly adversarial?) relationship, some Ontario municipalities may perhaps be doing simply what is necessary to meet the obligations set out in the legislation, and motivation to go beyond that point for the benefit of other cohorts may vary. In BC however, based on a history of provincial-municipal collaboration and provincial respect for local autonomy, both the province and its municipalities may perhaps be more invested in building internal capacity and in collaboratively improving AM practice across the province, for the benefit of the common collective. Though further research would be needed on this point, the paper's survey results seem to hint that it could potentially be a

factor, since several BC municipalities' scores in the Contribution to AM Practice competency area were higher (Level 2 or Level 3) than most of those in Ontario (Level 1) and the rest of the provinces (Level 1 or below).

9 Conclusions and Considerations

To wrap up the paper, there are several summary conclusions and observations that can be drawn from the research about the current state of AM maturity in mid-sized Canadian cities and the effectiveness of federal and provincial approaches/policies since the turn of the century to spur municipalities towards AM maturity.

First, as corroborated by the CIRCs and other reports throughout the past two decades (discussed in Section 7), the municipal survey conducted for the paper suggests that the majority of mid-sized cities across Canada are currently in the early stages of AM maturity (mostly at Level 1 (Aware) or Level 2 (Developing) on the FCM AM Readiness Scale), meaning they are in the process of planning and/or adopting AM practices, but have not yet fully developed or integrated those practices into their day-to-day business processes. Ontario and BC seem to be slightly further ahead, where proportionally more mid-sized cities have achieved Level 2 and some have achieved Level 3 (Competent). Given the small sample size and the focus on mid-sized cities, the survey results should probably be qualified with the statement that they may not necessarily be fully representative of all mid-sized cities in Canada, or of all sizes of single/lower-tier municipalities in Canada in general. On the other hand, however, it is possible that they may be reasonably indicative, given the corroboration from other published reports.

With respect to corroborative reports, it can be noted that in the recently established Canadian Core Public Infrastructure Survey, the category to document the existence of municipal AMPs by asset class is of limited use in assessing the state of municipal AM practice in Canada, because the existence of an AMP for one or more asset classes says little about its robustness nor the state of other competency areas of AM practice. Since many local governments across Canada are already familiar with and/or using the FCM AM Readiness Scale, perhaps a more useful data collection program would be to track municipalities' scores for each of its five competency areas. This would provide a more consistent, fulsome, and comparable picture of the state of municipal AM practice nationwide.

Second, the policy approaches taken by the federal and provincial governments in the past two decades to spur municipalities towards AM practice seem to have been limited in their effectiveness, given the current state of municipal AM maturity, although incremental progress has occurred, especially in the past seven or eight years. By type, Nodality-, Organization-, and Treasure-based policies seem to have been less effective than when Authority-based approaches have been mixed in with them, and the strong Authority exercised by Ontario in legislating municipal AM practices appears to have been the most effective of the lot. However, the province of BC is a notable exception, where progress seems to be roughly on par with Ontario without the use of a strong Authority-based approach. This is likely because in BC, multi-level governance patterns of inter-municipal cooperation, provincial-municipal collaboration, and provincial respect for local autonomy have been institutionalized over many decades and may provide a greater incentive for municipalities to participate in the policy

objectives of the senior levels of government, to build internal capacity, and to share knowledge with cohorts.

Third, some policy success, to the degree it has been realized, may also be attributed to other factors, such as the advocacy and awareness-building activities of communities of practice and municipal associations. On the other hand, some of the lack of success, especially prior to 2014, is likely related less to the policy types employed (per the NATO classification) and more to their design, in that they did not adequately address some of the key challenges municipalities faced, such as the lack of internal capacity, the lack of awareness of AM amongst elected officials and the public, and the lack of consistent or standardized guidance regarding what AM best practice to adopt and how. To be fair, the bar for determining the effectiveness of the policies should perhaps not be set too high, since the formalization and documentation of AM practice is relatively new in Canada and change is typically a slow process in local government.

Lastly, there are a few observations that can be made about the policies/approaches themselves, in terms of some improvements the senior levels of government could consider to more effectively address the challenges municipalities (especially small ones) face in implementing AM practice. For instance, there are several AM frameworks and best practice guides/standards in existence now, both within Canada and internationally. While a pool of resources is helpful, the federal and provincial governments could consider working together to recommend that a specific framework/best practice be adopted by all municipalities. This would help reduce confusion and provide the potential for more consistency and comparability across the country moving forward.

Perhaps most importantly, the federal government could also consider changing the eligibility rules for the GTF transfer program, such that certain municipal operating costs (such as providing funding for dedicated AM staff) would be eligible. The eligible amounts could be capped if needed, but such a shift would help address the internal capacity challenges municipalities (especially small and mid-sized ones) face by providing dependable, ongoing financial support for AM capacity building. While they have been beneficial to a point, programs like the MAMP that are generally time-limited, project-based, and easily redirected when a new political party comes to power are not as effective and historically do not seem to have gone far enough in establishing sustained evolution towards AM practice.

Also, given Ontario's recent Authority-based approach has seemed to be more effective, other provinces could consider following suit and legislating AM practice. However, if this is considered, it would best be paired with a more effective Treasure-based approach, such as the above-mentioned shift in GTF eligibility, so that municipalities will have the resources needed to meet the mandated requirements. Though a change to the GTF eligibility would require the federal government's agreement and collaboration with the provinces, this kind of blended approach (perhaps even enhanced with the adoption of a recommend best practice or framework) might have the potential to greatly accelerate the growth of municipal AM maturity nationwide, compared to the incremental progress seen over the past two decades.

As a softer alternative to an Authority-based approach, provinces could also consider following the collaborative BC example by increasing their support for AM communities of practice and implementing stronger Treasure-based approaches to support internal capacity building. It is possible though, that this approach might take longer to produce results, because

the BC model was developed over many decades and creating the same inter-municipal and provincial-municipal governance patterns in other provinces might also take a number of years.

Finally, as Canada moves forward through the third decade of the century, the policy approaches taken by the senior levels of government will likely continue to influence the pace of municipal evolution towards AM maturity (and by extension, infrastructure sustainability). Hopefully, the desire for multi-level collaboration that seems to have been established over the past two decades will continue to increasingly shape federal and provincial policy-making. Ideally, improved multi-level collaboration would ultimately lead to an improved governance model that is more strategically integrated, inclusive of all three levels of government, and consistently applied in all jurisdictions across the nation. Such a system might be capable of creating an integrated, national strategy to equitably resolve Canada's municipal fiscal imbalance and address its looming infrastructure deficit.

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