

# DIGITAL STRATEGIES & SMART TECHNOLOGIES IN ONTARIO'S MID-SIZED CITIES

AN EMERGING ROLE FOR  
ADMINISTRATORS

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## INTRODUCTION

In the past few years, digital and technological innovation strategies have become key pillars in city planning across Ontario and a “smart city” approach is now viewed as a necessary and expected inclusion in municipal strategic planning. The push for smart cities is also bolstered by a smart city industry, a market that by some estimates will be worth \$1.5 trillion in the coming years (Singh, 2014). These trends have not gone unnoticed at the federal level, with the Canadian government recently launching its own “Smart City Challenge”, offering a prize of \$50 million to a Canadian city that most successfully applies technological solutions to local governance issues. A majority of Canadian municipalities have thrown their hats into the ring (Infrastructure Canada, n.d.).

There are a few reasons that “smart cities” have become a staple of city governance strategies. Urbanization is continuing to grow in scale and scope, with more people living in cities than ever before. Localities are facing rising housing costs, environmental degradation, and infrastructure failings and are looking to the latest technological innovations for potential solutions. “Smart city” technology aims to mitigate the problems faced by cities through innovative and cost-friendly hardware and software solutions, as well as through the collection and analysis of data (Dameri, 2011).

A burgeoning body of literature calls attention to both the positive and negative aspects of smart city initiatives (Cocchia, 2014). On the positive end, some have argued that implementing smart technologies improves the quality of life for all residents (Bakici, Almirall, and Wareham, 2013) by highlighting their role in environmental protection and sustainable

development goals (Paskaleva, et al., 2017). On the other hand, critics have pointed to the corporate connection in technology procurement and its threat to the public good (Hollands, 2015) while also raising concerns about privacy and surveillance (Angelidou, 2017) and overall government control (Vanolo, 2014).

Mid-sized cities hold a distinctive place within the smart city agenda. Mid-sized cities often struggle with both the fiscal capacity and existent infrastructure to make smart city models a reality; however, they are encouraged to participate nonetheless. Evergreen recently published a report on some of the key issue-sets faced by Ontario’s mid-sized cities in this regard (February 2018). The report highlighted the unique opportunities available to the mid-sized city based on the inherent flexibility and agility of the smaller municipality. It also made mention of potential unfavourable outcomes, such as inequities and exclusions brought about through an ongoing digital divide in local communities.

It is thus important to bridge research in smart city governance and the specific case of the mid-sized city. The following research builds on Evergreen’s previous evaluative work while continuing forward with a critical lens. The main questions being: Where are smart city strategies housed, and who is in charge of their management? This paper uses summary research from city websites coupled with interviews with various city leaders to answer these questions and assess the current governance model of smart cities in Ontario’s mid-sized cities. For practitioners, this research presents a preliminary administrative model that highlights the importance of public administration in smart city development and suggests best-practices for ensuring public accountability in smart cities in Ontario.”

## ADMINISTRATION OF SMART CITIES:

### MAYOR-COUNCIL VS COUNCIL-MANAGER

The structure of city governance differs across North America and this has an effect on smart city strategies. The United States has a tradition of what is termed a “strong” mayoral system.<sup>1</sup> Even though in the past 50 years mayors have given up most of their “strong” powers to legislative bodies, the tradition of mayoral significance has produced a space that allows for initiatives with innovative funding opportunities and unique partnerships. In light of this, it is no surprise that most American smart city strategies, in both large and mid-sized cities, are housed within (or connected to) the Mayor’s office (see Boston, New York, Chicago, and Syracuse). Boston, for example, has the Mayor’s Office for Civic Innovation, which connects rigorous social science research to the integration of technological solutions. Chicago has the Department of Innovation and Technology, a robust civic organization, working within the city and with other partners on broad-based technology solutions.

Canada, on the other hand, is said to have a “weak” mayoral system, or council-manager model, where the mayor has “limited” powers (Scanton 2015, 225). In this model, smart city strategies are most often housed in one of two places: economic development departments or information technology departments. Their placement in these departments can hinder a more integrative approach to smart city development, but it can also ensure that outside influence is cut off. It is important for students of administration and technological governance to see how institutional dynamics such as these may play a role in successful outcomes for smart city strategies.

### DIGITAL/DATA/INFORMATION OFFICERS

Many cities engaging with smart city strategies have a Chief Digital Officer (CDO), Chief Innovation Officer (CIO), or Chief Data Officer (CDTO) in charge of the smart city portfolio. However, these positions are not inherently connected to smart city initiatives, but are instead tied to digital communications and online services. The core portfolio of the CDO varies, but usually includes the following:

- > E-government services
- > Website creation and maintenance
- > Open data initiatives
- > 311, or citizen communications applications
- > Internal communications platforms/software
- > Software/hardware procurement

Importantly, the role of the CDO is not merely that of an Information Technology (IT) specialist. Hillary Hartley, current Chief Digital Officer of Ontario, explains that the CDO’s job is “more about empathy, than about technology” and that the CDO bridges the divide between technology and the needs of citizens. She explains the role of the CDO in a four-pronged approach: “1) service delivery, 2) talent and training, 3) platforms, and 4) procurement—all driven by a citizen-focused approach to actionable deliverables” (Hartley, H., phone interview, January 31, 2018).

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<sup>1</sup> Many American cities have a municipal governance model that includes what has come to be known as a “strong” mayoral system, or mayor-council model. In this system, mayors have a larger role in the formation of the budget and have veto power in council, and they tend to direct policy initiatives more broadly (DeSantis and Renner, 2002). In the literature, this model is suggested to be associated with more economic development success (Wolman and Spitzley, 1996); however, it is also associated with more internal corruption and has therefore waned in popularity.

## CHIEF DIGITAL OFFICERS AND SMART CITIES IN ONTARIO'S MID-SIZED CITIES

Although the CDO is not a requirement for smart cities, they tend to be at the forefront of many municipal smart city strategies, specifically in larger cities (see Vancouver, Toronto, New York, and Boston). However, in mid-sized cities, there is less of an appetite for this position. In Ontario, Hamilton is the only mid-sized city to have a Chief Digital Officer in charge of smart city planning. In London, Ontario, smart city initiatives are housed by the Planning Department, and do not appear to have a CDO or technology lead. Oshawa, Brantford, Ottawa, and Waterloo Region are directed in smart city planning through their respective Economic Development departments. Kingston does not have any specific department committed to smart cities, per se, yet they have recently partnered with Bell to offer the city an Internet of Things<sup>2</sup> and data analysis package, ostensibly managed and monitored by the corporation and not the city (Kingston, Ont., signs 'Smart City' agreement with Bell, 2018). A detailed list of the portfolio management of smart cities is seen in Figure 1.1.

**Figure 1.1**

MID-SIZED CITY	OVERSIGHT OF SMART CITY PORTFOLIO	CHIEF DIGITAL OFFICER AS SMART CITY DIRECTOR
Barrie	None	N/A
Brantford	Economic Development	No
Guelph	University/External	No
Hamilton	City Manager's Office	Yes
Kingston	Bell Corporation/Economic Development	No
London	Planning Department	No
Niagara Region	Chief Administrative Office	No
Oshawa	Economic Development	No
Ottawa	Economic Development	No
Sudbury	None	N/A
Thunder Bay	None	N/A
Waterloo Region	Economic Development	No
Windsor	None	N/A

<sup>2</sup> A definition offered by the oxford dictionary for the Internet of Things: The interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data ("Internet of Things", n.d.) This includes things like: connected stoves, street light sensors, connected garbage bins, and connected street lights.

## WHY DO ADMINISTRATIVE MODELS MATTER IN SMART CITIES?

Smart cities need infrastructure, and not simply the “hard” infrastructure of roads and bridges, but also the “soft” infrastructures that make up communications networks like software applications, Internet of Things (IoT) technologies, and application programming interfaces (APIs). Since they cannot be produced in-house, cities procure these items externally.

Smart city technologies usually fall within one or more groups in a three-set typology: 1) multi-directional communications applications; 2) data man-

agement and analytics; and 3) Internet of Things technologies. These initiatives can be linked together in one single portfolio, as is the case in Hamilton, where the Chief Digital Officer is in charge of both open data portals and smart city strategies. However, these groupings are not always housed within the same portfolio, but are sometimes divided between discrete departments. For example, open data portals in London, Kitchener and Waterloo are separate affairs from the strategic policymaking regarding smart cities, which is the purview of the planning or economic development department.<sup>3</sup> There are mixes of these models as well. For instance, Waterloo makes mention of open data in its smart city strategy, yet it appears that the management of open data



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<sup>3</sup> City of London. Open Data. Retrieved from <http://www.london.ca/city-hall/open-data/Pages/default.aspx>; City of Kitchener. Open Data. Retrieved from <http://www.kitchener.ca/en/city-services/open-data.aspx>; City of Waterloo. Open Data. Retrieved from <http://www.waterloo.ca/en/government/opendata.asp>

**A model is needed for ensuring that city governments will always hold the reins in public-focused technological development, creating an institutional space that is safeguarded from private influence and given the proper space to tackle future issues.**

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is housed in a separate department (Waterloo. Smart City Initiatives. Retrieved from <http://www.waterloo.ca/en/government/smart-city-initiatives.asp>). However, there could be interdepartmental coordination in this instance.

In all administrative forms, cities who use technologies must decide on their key priorities, develop a strategy, and procure the needed infrastructure. With regards to the latter, there are many corporate offerings. Microsoft CityNext, AT&T, KPMG, Hitachi, Cisco, IBM, Schneider Electric, Siemens, Huawei, Ericsson, Toshiba, and Oracle all have packages available for municipalities. There are other “start up” options as well, offering tech solutions that work within broader packaged solutions; examples include Soofa (offering solar-powered benches) and Smartvue (offering IoT video surveillance).<sup>4</sup>

The task of contracting out these services is given to those in charge of a city’s smart city portfolio, and public administrators make the important decision of which platform or targeted solutions to use. However, city departments each have their own mandate and strategic focus and could potentially find themselves driven by their specific goal structure.

Similarly, corporate offerings of smart city hardware and software require consistent checks and monitoring.<sup>5</sup> These agreements are new and ongoing, making the results hard to quantify or qualify, yet one can infer how the utilization of a specific “smart city suite” could potentially influence future initiatives or technological developments—a company that has monopoly will likely seek to extend this position into the future, focusing instead on how to maintain clients as opposed to how to best service citizens. Without public service experts, elected officials, often limited in their technological literacy and engineering knowledge, could find themselves reliant on the knowledge offered by technology providers—a scenario that fundamentally takes control away from the public.

Avoiding external influence and providing ongoing checks and balances becomes an issue for the public sector, specifically in mid-sized cities where post-industrialization tempts civic leaders with quick-fix economic solutions. A model is needed for ensuring that city governments will always hold the reins in public-focused technological development, creating an institutional space that is safeguarded from private influence and given the proper space to tackle future issues.

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<sup>4</sup> Their products and offerings can be found here: <http://www.soofa.co/getsoofa/>; <http://smartvue.live/>

<sup>5</sup> For more on the corporate connection see, (Söderström, Paasche and Kalauser, 2014).

## THE CASE FOR A CHIEF DIGITAL OFFICER

Although most mid-sized cities in Ontario appear to house smart city initiatives through economic development departments, Hamilton stands out. Hamilton's CDO, Andrea McKinney, has recently been tasked with managing the city's entire digital strategy, which includes technological governance and smart city planning. She explains that her job begins with a firm citizen focus based on delivering quality service rather than being driven by corporate investment opportunities or strict economic development goals. She also notes how her position is one of an "advocate" and "facilitator"—a "translator" between departments focused on developing a "common language" for Hamilton's technological future (McKinney, A., phone interview, February 12, 2018). These directives (paired with her position within the City Manager's office) allow for a broad-based consulting framework that involves both the public and private sector, but focused on the citizen. This model seems to address some of the concerns surrounding smart city development in that it detaches the development and procurement of smart technology from a strict economic framework.

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A single change to this role might be considered—that is, a divided portfolio between the digital/data component versus the smart city/innovation strategies. This is the case in a highly regarded smart city like Boston. Kris Carter, Co-Chair of the Mayor's Office of New Urban Mechanics in Boston, explains that his department is largely concerned with developing new citizen-focused technology solutions with local academic partners, while the CDO is responsible solely for the communications and digital service delivery (Carter, K., phone interview, February 9, 2018). Dividing these portfolios nurtures a civic-focused smart city approach by allowing a singular target. The New Urban Mechanics office is directly charged with innovating Boston's smart future using rigorous academic and community-fronted research applied through good governance practices.

Both of these models share one thing: they are not housed in economic development departments. The danger in connecting smart city initiatives strictly with economic development is that smart city initiatives could become primarily tasked with bringing investment into the area to the exclusion or marginalization of other concerns. Instead of focusing inwards towards residents, they could look outwards to their place in a broader inter-city competitive economy. Mid-sized cities in particular have attached themselves to this economic development approach (Erickcek and McKinney, 2006), looking to bolster their image by fostering certain industries (Lewis and Donald, 2010); attempting to attract and retain talent (Gertler et al., 2014) within their post-industrial economies.

Economic growth is an important deliverable for city governments to consider; however, research into competitive city strategies explains how inter-urban competition fails to address residents' concerns regarding equity and inclusion (Peck, 2014; Cleave et al., 2017; Lever and Turok 1999). Research suggests that inter-city competition and place making does little to mitigate poverty, civic exclusion, unaffordable housing, and environmental degradation (Donald and Morrow, 2003)—all suggested targets for smart city initiatives. If smart city strategies in mid-sized cities are based within this framework, there is a chance they will not be beneficial to all residents.

Canada's smart city challenge does little to quell this impulse, given that its entire framework is based on inter-city competition. Yet, it remains an important marker of a successful administrative model that mid-sized cities avoid the pitfalls of a strictly competitive economic approach in their smart city programs. A CDO housed within the City Manager's office may be a good place to start, specifically in mid-sized cities that do not have the population size or budget for a Boston-style model. A key takeaway is that mid-sized cities should plan for a smart city strategy that will continue to change shape in years to come; ensuring that this shifting remains public-centered, open, equitable, and free of corporate influence requires a solid bureaucratic foundation.

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## CONCLUSION

A politico-economic perspective would point out that technology is not a fix-all or one-stop solution for the blight of contemporary cities, and that without addressing economic structural inequalities, labour market shifts, and social marginalization, technology will at best offer a band-aid or piecemeal solution for current urban issues. When delving into the milieu of smart city initiatives it is important to take heed of these structural issues and to tether each of them to a critical analysis based within a macro politico-economic assessment. At present, the best way of approaching these concerns is through a smart city strategy divested from any incentive structures outside of citizen equity, inclusion, and well-being, as well as service delivery. An administrative model that takes on a specific leadership role and houses that role in a central department appears to be the best practice for moving forward in the digital future of Ontario's mid-sized cities.



Barrie, Ontario



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