Beyond the Smart City: Assessing Open Data in Rural Ontario

by

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ABSTRACT

BEYOND THE SMART CITY: ASSESSING OPEN DATA IN RURAL ONTARIO

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Open Data has risen in prominence over the past two decades and it is now common for nations, provinces, and cities to establish online portals to make data publicly available. Rural municipalities in Ontario have not seen Open Data develop at the same pace, and it is unclear whether this is due to a lack of interest, insufficient resources, or some other factor. In this research, I analyze of the state of Open Data in rural Ontario, based on a survey and a series of follow-up interviews with municipal staff. This includes comparisons with rural development literature and theory, as well as overarching guidance for future data policy in Ontario.
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1 Introduction

The relationship between a government and its constituents can take many forms, and can often be considered as a division of control between these parties. This can range from complete government control of nearly all aspects of public life to complete citizen control of governance decisions, although several additional dimensions can be added to this discussion, resulting in many different forms of governance. Recent advances in technology and computing power have introduced a number of new questions for societies at all levels of resolution, from the individual to the social to the anthropological, and this reaches into the realm of governance as well. Many governments face new challenges surrounding how information is managed and how decisions are made within their organizations (Tapscott & Russell, 2010). In particular, the introduction of the World Wide Web and the ability to transfer information at a fraction of previous costs presents new opportunities for how governments conduct themselves and their assets.

The past century has seen large-scale advances in technology with steadily-increasing digital capacity and the widespread availability of cellular phones and other smart devices. These changes have altered the ways in which persons, groups, and peoples connect, communicate, and organize themselves, spurring connections and reshaping existing social structures. In particular, these advances have affected the way in which data is or can be made available and how data is used to influence societies.

More recently, trends in data production and provision have drawn the attention of governments, publications, and corporations. One of the more prominent trends is the focus on a phenomenon that is now termed “Open Data.” The potential for this trend to transform the transparency and accountability of governments, the economic status of cities, and the operational efficiency of institutions, among other things, has been discussed and theorized at length (Janssen, Charabalidis, & Zuiderwijk, 2012). However, concerns also exist regarding the possible pitfalls of adopting such technologies, and it is not always clear that movements to integrate these developments are as well-intentioned as they appear (Gonzalez-Zapata & Heeks, 2015).

The growing Open Data movement now advocates for information that is not private or of a reasonably sensitive nature to be made publicly available through electronic means. Many
supporters claim that opening datasets to the public will spur economic development, increase engagement with citizens, and reduce government expenditures, among other potential benefits. Some federal and provincial governments have invested substantially into this concept. For example, Estonia has transferred much of its services for citizens to an online format which greatly increases efficiency and convenience for users (Heller, 2017). As well, the Government of Canada has been particularly proactive in pursuing Open Data projects at the federal level and is respected on the world stage for its advances in Open Data (The Open Data Barometer, 2017). However, other governments have been more reticent to pursue these new endeavours, due to concerns surrounding privacy, costs, human capacity, or other issues. In truth, it can be difficult to definitively estimate the benefits of implementing an Open Data program in a particular location. Questions remain surrounding where and how Open Data initiatives ought to be implemented to maximize their effectiveness, efficiency, and accessibility.

In areas where Open Data has been pursued more strongly, such projects are often easy to find at the federal or provincial level. Several major cities around the world have also invested resources into such projects. These works and the fruits which they have borne have improved the lives of citizens, fostered new and innovative technologies, and uncovered trends which had previously been unknown. However, in rural areas outside of large urban centres, such projects are relatively rare, and it is unclear whether this is due to a lack of resources, a lack of interest, or another factor.

The terms used above such as “open,” “data,” “rural,” and “government” may either not be familiar to all or may have different meanings for different people. Before proceeding further, I will outline the varied ways of understanding some of the major concepts which will arise in this paper.

1.1 Defining Open Data

As governments have become more adept at collecting larger sets of data at lower costs, these datasets have become easier to release and more useful in improving the quality of life in cities and communities across the Western world. Some governments have opted to make their stores of data freely available for the public to access and manipulate. These initiatives can take
various forms, and it is difficult to create a single, universally-accepted, precise definition of Open Data. For instance, Wylie, Robinson, and Malczewski (2017) cite the Open Definition 2.1 (n.d.) which requires an “open” work to be freely available, in whole, in a machine-readable format (i.e., one that can be automatically read by a computer program), and provided with an Open Licence. An Open Licence is then determined by its adherence to 16 criteria listed in the Open Definition 2.1 (listed in Box 1-1), such as the licence allowing for use, reuse, modification, and re-application of data without charge.

On the other hand, OpenGovData (n.d.) outlines eight principles for Open Data, along with seven additional possible principles. Their main principles require data to be as unedited as possible, made available in a timely fashion, and free of any licence, among other things. Additional qualifications may include the online availability of data, the use of public input in designing open data delivery systems, the permanent availability of data, and more. Berners-Lee (2009) suggests a stratified definition ranging from 1-star Open Data, which must simply be freely available online, to 5-star Open Data, which must be freely available, machine-readable, accessible with non-proprietary software, and linking to other datasets to foster increased usability. This particular definition aspires to encourage a global web of “linked data,” relying on a universally-used system of data identifiers, which allows for streamlined navigation, manipulation, and calculation using this data.

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<tr>
<td>1. Be freely available</td>
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<td>2. Allow redistribution</td>
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<td>3. Allow modification</td>
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<tr>
<td>4. Allow separation of data</td>
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<td>5. Allow compilation into other works</td>
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<tr>
<td>6. Be non-discriminatory towards people/groups</td>
</tr>
<tr>
<td>7. Retain these rights after redistribution</td>
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<tr>
<td>8. Be available for any use</td>
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<td>9. Not impose royalties or fees</td>
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<table>
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<tr>
<th>The Open Definition 2.1 permits Open Data to:</th>
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<tbody>
<tr>
<td>1. Require attribution to contributors</td>
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<tr>
<td>2. Require modified versions to use different names or version numbers</td>
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<tr>
<td>3. Require retention of licences to redistributed works</td>
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<td>4. Require retention of copyright notices</td>
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<td>5. Require access to source material in redistributed works</td>
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<td>6. Prohibit measures in redistributed works that restrict otherwise-allowed rights</td>
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<tr>
<td>7. Require measures in redistributed works allowing exercise of licence rights</td>
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(Open Definition 2.1, n.d.)

**Box 1-1 Open Definition 2.1 Summary**
A simple and straightforward definition for Open Data, which aligns well with the purposes of this paper, comes from the work of Rufus Pollock (2006). This succinctly defines Open Data as data that is available for free use, reuse, or distribution, with the options of requiring attribution to the source material and/or similar sharing by the user. Such a definition allows for a wider range of interpretations which may be found across a group of practitioners, theorists, and users, while still retaining the most salient aspects of most Open Data definitions.

By extension, “Open Government Data” (OGD) refers to any dataset or database that can be considered Open Data which is owned by a governmental body. These are most often provided freely through online resources called Open Data Portals which are managed by the government itself.

Even the use of the term “data” may cause disagreement or confusion. Kitchin (2014) outlines the roots of the term along with the epistemological debates surrounding the relationship between “data” and the truth as an objective reality. Distinctions can also be made between “data” as the raw elements as measured by a person or device, “information” as the same elements being linked and given a degree of meaning and relationship, “knowledge” as an organization of these relationships in a more comprehensive form, and “wisdom” as the application of knowledge and the additional knowledge that it may yield (McCandless, 2010). Although these are not trivial discussions, for the purposes of this paper, the term “data” is not restricted to any of these categories in particular, but may instead refer to simple words and numbers or to comprehensive reports and findings. For the purposes of data collection within this project in particular, I allow data to be defined by the participants in the survey and key informant interviews.

1.2 Defining Rural

Although most individuals may think of particular images when the word “rural” is used, there is no universal technical definition of the word “rural.” Cloke (1985) notes the challenges in creating a definition that can be applied in various disciplines, contexts, and cultures, and in ever-changing environments. The meaning of “rural” may be determined by organizations such as governing bodies, researchers, or a local population. When considered in relation to the word
“urban,” “rural” may be seen as exclusively referring to non-urban areas, or the two may be seen as having some overlap. There may also be finer gradations of definition alongside “urban” and “rural,” such as “urban core,” “suburban,” “exurban,” “small town,” or “remote”.

Areas may be classified as rural based on descriptive characteristics such as population, population density, distance to major urban areas, or a combination of these metrics. Social and cultural conceptions of rurality have also been proposed, determining rurality by the prominence of features such as the social bonds within a community, a history of agriculture, or by the presence or absence of certain institutions or entities. For instance, Wirth (1938) discusses “urbanism” and “ruralism” as distinct “ways of life,” with the former representing dynamism and an openness to change and the latter signifying rootedness and familiarity. Halfacree (1993) suggests that both approaches are inadequate as they attempt to base a definition around a pre-conceived idea of what it means to be rural. Instead, Halfacree suggests using social representations of rurality, meaning that discussions of “rural” must rely on both academic and lay discourses surrounding what “rural” means. Ultimately, arriving at a fixed, universal definition is less relevant than being aware of different definitions, being able to compare and contrast them, and being open about the definitions that are used (Halfacree, 1993).

Analytical research and policy tend to rely on statistical definitions, since these offer faster and more objective applications, especially to larger geographical areas such as countries. However, even within the realm of statistical definitions, one can find many different approaches. DuPlessis, Beshiri, Bollman, & Clemenson (2002) detail six definitions of rural areas which may be applied to Canada at the national level. Statistics Canada, the Federal Government’s official statistical body, uses two definitions of rural: “Census Rural” and “Rural and Small Town.” Census Rural refers to populations outside of centres of 1,000 or more in size, while Rural and Small Town refers to populations outside of the commuting zones of centres over 10,000 in population. In addition, definitions can be drawn from the Organization of Economic Co-operation and Development (OECD) which defines a “rural community” as one with fewer than 150 persons per square kilometre, and “predominantly rural regions” as census divisions where over 50% of the population resides in a rural community under their definition (OECD, 2011). Finally, other definitions of rurality also exist, such as Beale non-metropolitan
regions (which are regions outside of metropolitan areas with urban centres of 50,000 or more population) and classification by postal codes (which, in the Canadian context, are determined at a fixed point in time by a postal organization based on factors related to postal delivery). For use in Canada, Statistics Canada’s Rural and Small Town definition is regarded as a balanced compromise of multiple factors encompassing common perceptions of rurality (DuPlessis et al., 2002).

For the purposes of this paper, this research allows participants to define their own communities as “remote,” “rural,” “suburban,” or “urban,” based on their perceptions. This paper relies on this self-definition for classification. In principle, this is closest to Halfacree’s approach of social representation (1993), although it does not guarantee a common understanding among participants. Areas marked as “remote” and “rural” are taken to comprise rural areas more generally, whereas areas named as “suburban” and “urban” at taken to comprise urban areas. This is based on the perception that areas near urban centres in Canada tend to see higher rates of population growth and often do not face the same challenges as areas farther afield from urban centres. The results of relying upon self-definition by participants will be further discussed in the results section of this paper.

1.3 Defining Government

“Government” refers to the formalized structures which are given legitimacy to exert power over, manage resources for, or provide services to a given group of people or geographic region. This may be contrasted with the term “governance,” which refers to the de facto method through which power, resources, and services are managed for a group or area. Therefore, the government of an area may also be the agent overseeing the governance of the same area or it may be one of several agents which work together to manage local governance. In some cases, the formal government may have relatively little impact on the actual governance of the area, with this instead being managed largely by other groups and individuals.

Within Canada, there are, broadly speaking, three levels of government: federal, provincial, and municipal. In Ontario specifically, the municipal level is often divided into an upper-tier (often called a county, region, or district) and a lower-tier (often called a city, town, or
township), with several lower-tier municipalities being included in a single upper-tier one. These two tiers divide different aspects of municipal governance in ways that vary by region. However, in some parts of Ontario, the municipal level is only composed of a single tier which provides all relevant municipal services (Tindal & Tindal, 2009). Currently, there are 241 lower-tier municipalities, 30 upper-tier municipalities, and 173 single-tier municipalities in Ontario (Government of Ontario, 2018a).

Within the context of this paper, I will focus primarily on the municipal level of government. This includes upper-tier, lower-tier, and single-tier governments across the province. Some references will be made to other levels of government, especially to provincial government. Aspects of governance will also be discussed in the section on interview results, particularly as some of the questions used in interviews touch on this subject with regard to Open Data. On an editorial note, in this report the capitalized “Province” refers to the provincial government of Ontario, whereas the uncapitalized “province” refers to the geographic region of Ontario.

1.4 Open Government in Canada

The roots of Open Government in Canada can be traced back to the introduction of the Access to Information Act and the Privacy Act of 1983 by then-Prime Minister Pierre Trudeau’s government. These acts attempted to balance the provision of information to members of the public with the safety of individual privacy. Under this system, access-to-information (ATI) requests were tracked through the government’s Co-ordinated Access to Information Request System (CAIRS), the content of which was later released in the form of public reports (CBC News, 2008). The effectiveness of the Access to Information Act has been criticized by Shocat (2010), who raises concern over delays in responding to ATI requests and a corporate culture that sometimes discourages the release of information. Shocat distinguishes between the linguistic origins of the Canadian Access to Information Act and the U.S. Freedom of Information Act of 1967, commenting that, whereas U.S. legislation recognizes intrinsic rights of citizens to certain government-owned information, the Canadian system has tended toward data being owned by the state and released as the state deems it appropriate.
In 2008, citing concerns about cost and efficiency, then-Prime Minister Stephen Harper discontinued the operations of CAIRS, although this move was criticized as restrictive and secretive (Fenlon, 2008). Following this, however, the same Government launched a pilot version of a federal Open Data Portal in 2011 (Berkow, 2011). That same year, Canada joined the Open Government Partnership, an international organization seeking to “make governments more inclusive, responsive, and accountable” (Open Government Partnership, 2017, para. 3). This action committed Canada to produce plans for its implementation of Open Government principles, which spurred the development of Canada’s first Action Plan on Open Government for 2012-2014 (Government of Canada, 2018a). The plan focused on the issuing of a new Directive on Open Government which directed 106 federal departments and agencies to maximize the availability of data online with a focus on the timing, format, and standard under which data would be released. As well, the first Action Plan issued a universal Open Government Licence (Government of Canada, 2018a) which may be applied to Open Data at all levels of government (Government of Canada, 2018b). This licence allows for re-use of data by users in order to encourage use of Open Data both locally and across federal borders. Among other goals, this Action Plan also led to an expansion of the federal Open Data Portal and changed it from a pilot project to a permanent initiative (Government of Canada, 2018a).

A second federal Action Plan on Open Government followed in 2014 for the period of 2014-2016. This plan built on the work of the previous plan by updating the Open Government Licence and Directive on Open Government. It also sought to better integrate data from different levels of government within Canada (by establishing the Canadian Open Data Exchange to facilitate sharing and coordination of data), as well as between Canada and other countries. Additionally, this Action Plan included provisions for greater openness for scientific data, reports on resource extraction, and government contracts (Government of Canada, 2018b). In an End-of-Term Assessment Report based on this plan, the government reported that, of 12 commitments identified in the plan, 2 had been completed, 8 had seen substantial progress, and 2 remained incomplete (Government of Canada, 2018c).

The most recent Action Plan published by the Government of Canada was released in 2016 and covers the period of 2016-2018. In light of the work remaining to be done in the
second Action Plan, the 2016-2018 plan continues to pursue many of the same objectives such as increasing governmental transparency and access to Open Data. This plan also adds new goals focusing on promoting Open Data as a catalyst for innovation and engaging the public for input on policy making and assistance in improving services (Government of Canada, 2018d). In a draft version of an End-of-Term Self-Assessment Report, the government claimed that, of 22 commitments listed in the third Action Plan, 16 had been completed and 6 had seen substantial progress (Government of Canada, 2018e).

Due to the focus placed by the Federal Government on the development of Canada’s digital capabilities, particularly with regard to Open Data, the country is now considered one of the world’s leaders in Open Data and Open Government. The Open Data Barometer (ODB), an initiative of the World Wide Web Foundation, assesses the relative effectiveness of national Open Data programs around the world. The ODB’s evaluations are based on a country’s readiness to pursue Open Data initiatives, implementation of programs, and impact of programs on business, policy, and civil society. Canada has slowly yet steadily risen through the ODB’s rankings, and in 2017 was tied with the United Kingdom for the top spot in the rankings (Open Data Barometer, 2018). Clearly, Canada is well-regarded in Open Data and Open Government circles and its major data initiatives have been successful in the past few years.

Currently, the Federal Government, eight provincial governments (listed in Box 1-2), one territorial government, and several larger municipalities have adopted Open Data policies and created online Open Data portals (Government of Canada, 2017). As well, provinces and territories which do not maintain official Open Data portals often have related initiatives where some forms of data can be obtained, such as the Manitoba Land Initiative, which provides geo-spatial data for the Province of Manitoba (Government of Manitoba, 2017). However, the extent to which the benefits of these technological advances are reaching those outside of large urban centres is not clear. Within the context of rural planning and development,
it is crucial to understand the opportunities that these developments in data technology present to rural areas, along with possible obstacles to their adoption in these areas.

A related issue on the topic of Open Data, especially for rural development, is access to the Internet and broadband connection, which must also be assessed across Canada. As mentioned above, most Open Data is made available online and accessed through Open Data portals; therefore, this technology has little to no impact among populations without Internet access. Rural areas in Canada have been historically disadvantaged in access to the Internet due to the increased costs of providing service to a sparsely distributed population over large distances. This has led to a market failure where rural citizens either do not have access to the Internet or cannot reasonably afford access. Many rural communities also trail their urban counterparts in human capital and the ability to effectively use digital technologies (Breen, Ashton, & Kelly, 2017). In 2014, the Federal Government launched the Digital Canada 150 initiative to prioritize digital infrastructure and invest in economic development through digital technologies. This plan included funding to expand broadband coverage to 98% of Canadians at a speed of 5 megabits per second (Mbps) (Government of Canada, 2014).

However, the Canadian Radio-television and Telecommunications Commission (CRTC) estimated in 2016 that 18% of Canadian households still lacked access or had insufficient access to broadband service, with areas outside of large urban centres being particularly affected by this problem. Part of the difficulty in providing adequate Internet service is the shifting definition of what is considered adequate, which increases as technology allows for (and then often requires) ever-higher bandwidth capacities. In making the above statement, the CRTC considered sufficient service to include download speeds of 50 Mbps and upload speeds of 10 Mbps, both of which far exceed the previous benchmark set by the Federal Government (Kupfer, 2016).

When the above assessment was made in 2016, the CRTC also declared broadband Internet a “basic service” (stressing the need to expand this service to rural and remote Canadians) and laid the groundwork for an infrastructure fund that would be supported by Internet Service Providers to expand coverage into rural areas (Kupfer, 2016). As of 2018, the CRTC has established its Broadband Fund and will begin accepting applications for projects in 2019, with a target of providing service with 50 Mbps download and 10Mbps upload speeds to
90% of Canadian homes and small businesses by 2021 (Canadian Radio-television and Telecommunications Commission, 2018). While steps are being taken to improve access to digital technologies in rural Canada, and infrastructure and affordability gap persists between rural and urban Canada.

1.5 Purpose of Study

The investigation in this paper seeks to better understand the potential for Open Data programs to be implemented in rural communities in Ontario. This includes opportunities and obstacles that arise from citizens, local government, higher branches of government, businesses, interest groups, and any other relevant actors. I seek to understand whether the apparent divide in Open Data initiatives between urban and rural Canada is rooted in a lack of interest from rural areas, obstacles in rural areas such as a dearth of resources, or another, previously unknown factor. In rural areas which have invested in these developments, I also wish to explore whether these are being done through unilateral methods on the part of the local government or through more collaborative means with other groups and persons.

1.6 Research Questions

This study focuses on the three following questions of interest:

1. What factors drive the adoption of Open Data in rural Ontario? Are there expected benefits, and if so, what are they? Is there a felt need for investment in this technology in rural Ontario?

2. What factors impede the adoption of Open Data in rural Ontario? Are there major obstacles to this work, and if so, what are they? Are communities simply not interested in this technology?

3. Is the introduction of Open Data changing governance in rural Ontario? Can it lead to a greater sense of collaboration in a community, or is it largely a government-driven effort?

1.7 Structure of Paper

Following this introduction, Chapter 2 provides a review of the standing academic and grey literature relevant to this study. Chapter 3 describes the methods used and the rationale for choosing it, while Chapter 4 provides the immediate results of this work. Chapter 5 discusses the
results in terms of policy implications and their place within wider theoretical and political discourses. Chapter 6 describes limitations to the study and challenges encountered over its course. Chapter 7 outlines next steps and areas for future work in the shadow of this study, and Chapter 8 offers a brief conclusion.
2 Literature Review

Before presenting the methodology and results of this work, I will first provide a review of the standing literature on the phenomenon of Open Data. I will discuss results from the academic literature as well as from sources from the grey literature, where applicable. This review covers a spectrum of results, including the theoretical discussions surrounding benefits and pitfalls of Open Data, but also including more practical studies from various countries which assess the implementation of Open Data systems.

This chapter gives focus to the role of Open Data systems in the context of government and planning operations. Where possible, special attention is devoted to the contexts of Canada, Ontario, and rural regions in these jurisdictions. I will begin by reviewing their touted benefits and perceived drawbacks and then proceed to summarize recent major in-field studies and discussions.

2.1 Perceived Benefits of Open Data

Much has been written regarding the potential for Open Data to impact public life and organization in developed countries. In analyzing the changing business culture surrounding data in general, The Economist (2017a) notes the ascendancy of data as a major economic factor. The magazine posits that the world’s five most valuable firms are heavily invested in data collection and use, and that these firms generated a combined profit of $25 billion USD in 2016. It goes on to compare data’s role in the coming century to the role oil played in the previous century, producing everyday objects and resources for the global economy (The Economist, 2017b). Direct economic impacts and opportunities have been attributed to Open Data as well, as The Economist estimated in 2013 that €140 billion in economic activity remained untapped in European governments (The Economist, 2013). Verwayen, Arnoldus, & Kaufman (2011) also note several economic advantages to opening up an organization’s data from a social and public relations point of view. These include increased relevance to customers, improved brand value, and the potential to attract new customers.

Non-economic benefits of Open Data have been noted as well. Janssen, Charalabidis, & Zuiderwijk (2012) found that increased transparency and accountability were some of the main
arguments made for opening government datasets. This group also argued for the potential for OGD to increase operational efficiency within a government by reducing restrictions on data reuse, optimizing administrative processes, and allowing data to better influence policy development.

Within the realm of city planning, several practitioners have voiced support for increasing the use of these new data trends, with the May/June 2017 issue of the Ontario Planning Journal focusing on the potential of data to transform how municipal planning is done. In a wide-ranging assessment of emerging innovative uses of data, Huijbregts (2017) suggests that several disruptive technologies will continue to change the nature of city life and that technological advances can help to alleviate issues in energy efficiency, public safety, and transportation. These innovations include data collected from the Internet of Things – a digital network of electronics-embedded devices – as well as the developments of self-driving vehicles and the sharing economy, in which resources such as living space and cars, which were formerly privately owned, are managed in more collaborative ways. Huijbregts argues that planners must anticipate change as well as possible and search for ways to incorporate new technologies like Open Data to reduce catastrophic disruption in established systems, implying that to not do so would demonstrate a lack of foresight. Harnessing the power of developing technologies will involve co-operation with organizations that develop and use data, and it will require “an open, secure, and scalable digital infrastructure” to allow for greater communication and collaboration. This collaborative view is echoed by Tyrell & Shah (2017) as well.

McCarney (2017) focuses on the potential for data in larger cities to lead to responsible city governance, especially with regard to environmental stewardship. With more oversight of city practices now possible, international standards are being developed to assess the social, economic, and environmental performance of cities. The first of these to be developed focuses on 100 indicators measuring the how sustainably a city is developing, and two new standards are being developed by the World Council on City Data to identify “resilient cities” and “smart cities.” These standards can set goals toward which cities can grow, and they can be used to compare cities across and within countries.
Wylie et al. (2017) also comment on the potential uses of data in city planning, claiming that Open Data may serve to empower residents and increase public relations by providing greater justification for public decisions. They note that data requires interpretation and effective management, and that, therefore, academic programs for future planners should strongly consider an increased focus on equipping the next generation of planners with skills to work with and interpret datasets in meaningful ways.

A view of Open Data in government that may be considered at the boundaries of current discussion comes from Tapscott & Williams in their book Macrowikinomics (2010) who examine the how Open Data may change the character of governmental operations in all of its forms, including local government. Beyond simply implementing Open Data within the existing structures of government and providing greater amounts of data to the general public with greater ease, the writers argue that government as it stands is a relic of industrial age thinking and needs to be renovated at in its deeper structures. Principles of openness, collaboration, sharing, integrity, and interdependence need to instead be integrated into the daily activities of government in innovative ways to radically reduce costs in terms of time and finances. This, it is argued, will enable governments to remain competitive in relation to corporations and organizations which are also pursuing innovation through open platforms and increased data-sharing in lieu of bounded silos of information. However, although Open Data as a concept has risen in prominence and some governments have deeply invested in this such as Estonia mentioned earlier (Heller, 2017), it is unclear to what extent these innovations can be reasonably integrated into the work of the average governmental body.

2.2 Perceived Concerns Regarding Open Data

Despite the much-touted benefits of Open Data policies, these new developments also have their detractors and objections. While there are clear economic uses for these technologies, access to these technologies (and to their meaningful use) can be an issue. The potential exists for data systems to be designed and used for those already at an advantage in society and to exacerbate existing social differences. The resources and skills needed to access, assess, and effectively act upon data can restrict the pool of potential users (Johnson, 2014). For example, Donovan (2012) comments on the case of the Bhoomi e-government project in Karnataka, India,
which was put forward to help low-income communities but took little input from these communities and instead largely benefitted already well-off populations elsewhere.

Additionally, the expected results of opening data projects do not always manifest in reality. An examination of Open Data initiatives in New York City, NY and Edmonton, AB found that these projects tended to quickly deplete the amount of available data that could easily be opened (Helbig, Cresswell, Burke, & Luna-Reyes, 2012). These projects were expected to produce positive feedback loops in which data releases built upon and encouraged each other. However, they instead peaked in utility due to constraints on user capabilities, management practices, and other issues. This report suggested that the early successes that organizations often seek will tend to diminish in frequency over time, impacting effectiveness and use. If these initiatives require substantial costs in order to be set up, then a lack of results will run counter to the public interest. As well, Urbanski (2013) opines that the lack of a clear and commonly accepted goal for an Open Data initiative may lead to issues during implementation, and that setting appropriate benchmarks with measurable indicators can yield better results.

In a similar vein, McClean (2012) also notes challenges in the case of the United Kingdom’s Combined Online Information System (COINS). This system publishes government expenditure data, but it ultimately did not have as great an impact on political discussions in the country as expected. The data that were published in COINS tended to be too complex to allow for public analysis, even after being prepared for release. Therefore, it became difficult for journalists to effectively report on the data being released.

More saliently, the underlying rationale for Open Government Data has been called into question by some researchers. McClean (2012) draws comparisons between modern OGD initiatives like COINS and the earlier Thatcher government, which was based in principles of New Public Management and a corporatization of the State as a means to improve efficiency (Allmendinger, 2002). Both the Coalition government which implemented COINS and the Thatcher government stressed an agenda of transparency, accountability, and efficient government (Mcclean, 2012). McClean also notes the advantage that OGD presents for private corporations that have access to this new data, whereas these corporations are often not required to make similar concessions of their own data.
These concerns are further echoed by Bates (2012), who also discerns a neoliberal drive to allow the free market access to government information. Suggesting that this is a form of modern deregulation, Bates argues that the Open Data movement, which consists of members from across the political spectrum, has been co-opted in the U.K. by private interests for their own benefit. Bates thus urges the need for the Open Data movement to foster democratic and inclusive discussions regarding the planning and implementation of such initiatives in the future.

Specifically in discussions around data in the planning profession, Wylie et al. (2017) offer a word of caution toward incorporating data into planning decisions. Although data can give insight for certain issues, contextualize a problem, and provide a measurement of progress, data often only tell part of a larger story. Data-based assessments often focus on quantitative analysis that can ignore or under-value qualitative discussions about the nature of a public place. The authors also note the need to examine the types of public data being collected to ensure that they encompass all relevant qualities of a place, which may extend beyond systemic efficiency or financial stewardship.

2.3 Academic Studies of Open Data Initiatives

Clearly, much has been written about the potential for data to affect the planning process, government practices, and life in the public sphere. Views on new data technology range from optimistic to deeply skeptical. However, actual assessments of Open Data initiatives remain limited for now. These studies focus on a range of projects at federal, provincial, and municipal levels in various countries to explore the opportunities and challenges for these projects as well as the way in which data is used among different groups of people.

With regard to the use of data among different groups, Gonzalez-Zapata & Heeks (2014) analyzed documents related to a Chilean OGD initiative to determine key stakeholder groups such as politicians, international organizations, and academics, among others. These groups were then ranked in terms of their relative power and interest in OGD and representatives from these groups were interviewed to gain a better understanding of OGD in Chile. The team also derived a framework of four perspectives supporting OGD for different reasons, and the Chilean context was analyzed in light of these perspectives. The study found that the most prominent voices
(such as politicians and public officials) held to bureaucratic and political approaches, with OGD initiatives being driven by perceived improvements in government processes and by a desire to appear transparent and honest. This latter concern is partly rooted in Chile’s recent transition to democracy and a desire to present well to foreign governments and investors. On the other hand, the authors found little to no evidence of technological and economic perspectives based in improving the local data infrastructure or boosting the economy. They conclude that assessments of OGD projects must consider a government’s capacity and incentives for OGD, along with its particular context, and that clear generalizations among countries are difficult to make.

Another study by Dawes, Vidiasova, & Parkhimovich (2015) devised an ecosystem model of OGD that incorporated feedback loops between system providers, users, and beneficiaries. The study then examined OGD initiatives in New York City, NY and St. Petersburg, Russia and used the results to further develop this ecosystem model. The team reviewed documents, web sites, and performance statistics and interviewed government officials, community leaders, and application developers. The two cities were chosen due to similar demographic and economic characteristics and starkly different political and administrative features. The study found that the New York City OGD project involved a signal of commitment from the upper echelons of the city government but allowed flexibility for how the project was implemented by different departments. Application developers were involved in certain aspects of implementation and feedback was welcomed from users. In contrast, the St. Petersburg initiative used a top-down approach that seldom acted upon received feedback. Based on statistics for portal use and application development, the study found the New York approach more effective in providing and mobilizing public data.

Conradie & Choenni (2014) examined the opening of datasets among various municipal departments in Rotterdam, the Netherlands. The team used a Participatory Action Research model that relied on workshops, questionnaires, focus groups, and case studies. The study found that different departments implemented Open Data directives to different degrees, with data being made available to different degrees of use and reuse. Some departments were better poised to release data due to central data storage and clear data ownership, whereas others were hesitant to open datasets because of concerns about privacy, ownership, the rationale for data release, and
the potential for data to be misinterpreted by the public. These issues were specific to the nature and role of each department, leading the authors to suggest that the contexts of various departments be considered individually, even within a single municipality. Similar to Urbanski (2013), they recommended having a clear reason for an Open Data initiative to justify the process to those involved.

Wang & Lo (2016) conducted a study surveying 626 Taiwanese government agencies regarding the implementation of Taiwan’s 2012 OGD policy at both the local and federal level. The study focused the impact of perceived benefits, perceived barriers, organizational structure, and pressure from external groups (such as business partners or customers) in whether an agency implemented the OGD policy. The authors determined that OGD was more likely to be adopted in agencies where perceived benefits were clear, where IT infrastructure and top levels of management supported the initiative, and where external groups supported OGD adoption. Perceived barriers were not found to correlate with OGD adoption, likely due to the tendency for these issues to be outsourced to experts capable of addressing them. While they suggest that similar initiatives stress perceived benefits and ensure that IT infrastructure adequately supports OGD adoption, the authors note that a limited response rate of 56.6% and the historical and political context of Taiwan make it difficult to generalize the results to other countries and stress the need for additional studies in other jurisdictions.

Finally, Guo, Wang & Xie (2015) present a profile of China’s Rural Comprehensive Information Services (RCIS), which aim to support rural areas using Big Data techniques. This system is one of the few Big Data initiatives which focus on a rural setting, but the system discussed also includes an Open Data application. These services consolidate information from various high-level data sources and translate the results for farmers, aiming to support them through knowledge/skill development, farm management improvement, and crop, disease, and market data provision. RCIS content is available online but is also distributed through consulting and training services. It should be noted that, although this paper did not state a definition of “agricultural” or “rural,” the RCIS program specifically focuses on the agricultural sector in driving rural development. China’s Ministry of Agriculture and Rural Affairs oversees rural development as part of its mandate, which includes “agricultural industries such as crop
production, animal husbandry, fishery, rural and township enterprises” (Ministry of Agriculture and Rural Affairs, 2018, para. 3), and “agricultural” and “rural” are used relatively synonymously in China. At the time of publication, 12 regional RCIS programs had been developed and a National RCIS Program had been announced that would serve the country as a whole while integrating already existing RCIS programs.

2.4 The Canadian Context in Academia

Having discussed various opinions on Open Data, and having surveyed the academic literature related to these technologies, these developments can be discussed in terms of the Canadian context for Open Data. As previously mentioned, Canada is generally perceived as a world leader in these trends, but while new data initiatives have been lauded in the Canadian press (CBC News, 2016), the academic literature on the Canadian data landscape currently appears slim.

At times, Canadian practices have come under criticism in terms of impact. For instance, Vogel (2011) criticizes the performance of government agencies such as Statistics Canada and Health Canada in providing data to the public. At the time of publication, some queries for Health Canada data required requests for access to information that limited accessibility. As well, some of this data was technically available online but was available in non-searchable file types or buried in databases that are difficult to navigate. Some Statistics Canada data was hidden behind paywalls as well, and together, these mean that municipalities may not have free access to data about their own constituencies.

Previously, the Government of Canada maintained the Community Information Database (CID) which published data from federal agencies for communities across Canada (Government of Canada, 2011). This service was developed by Canada’s Rural and Co-operatives Secretariat and provided economic and social data and indicators for communities across Canada, including rural areas. However, while the database remains available online, the Rural and Co-operatives Secretariat was dismantled in 2013 (Wilson, 2013) and the most recent data available on the CID appears to be from the 2011 National Household Survey.
As mentioned earlier, Canadian data policies have seen great leaps forward in recent years, including the implementation of an Open Government Policy and three Open Government Action Plans (Government of Canada, 2016). As discussed above, several sub-national governments have also adopted Open Data initiatives, including the Province of Ontario, the largest by population (Government of Ontario, 2017a). Ontario has implemented an Open Data Directive as well, which specifies that all data within provincial ministries be made public unless there are privacy or security concerns that prevent such action (Government of Ontario, 2017b). The Province has established a central Open Data portal which at the time of writing has 716 datasets available from 29 departments, 246 datasets waiting to be opened, 882 that are under review, and 811 that are restricted. Some departments have published large numbers of datasets, such as Health and Long-Term Care (369 datasets); Agriculture, Food and Rural Affairs (274 sets); and Natural Resources and Forestry (226 datasets). Others lag behind and have only published a few, such as Indigenous Affairs (1 dataset), Intergovernmental Affairs (2 datasets), and Seniors and Accessibility (5 datasets) (Government of Ontario, 2018b).

A thought-provoking assessment comes from Roy (2014) who discusses several Canadian municipalities that have proactively implemented Open Data policies, such as Nanaimo, BC; Halifax, NS; and Edmonton, AB. While praising these steps, Roy interprets them as being symptomatic of a divide between two schools of thought: a traditional government structure that is reticent to change and to offering data resources to the public, and a modern worldview that sees data as a public good which ought to be freely available. Roy also notes the wide effects of new forms of media on public relations for governments and on governance in general. Many areas of crossover may be drawn between Roy’s work and that of Huijbregts, discussed above (Huijbregts, 2017).

A single study from 2014 was found exploring the potential for Open Data to support the adaptive capacity of rural Ontarian communities to respond to the ongoing phenomenon of climate change (Skinner & Hambly Odame, 2014). Focused in the Region of Waterloo, this study involved qualitative assessments of federal, provincial, and municipal Open Data portals, as well as interviews with public servants, data librarians, and Open Data advocates. Challenges identified by the study included a lack of awareness among the public around Open Data, a lack
of data infrastructure and technology, a low rate of data literacy among the public, the financial burden of maintaining effective data resources, and a low perceived utility of OGD.

In addition to the Region of Waterloo study, the Selkirk Geospatial Research Centre is in the midst of a three-year research project to study whether and how Open Data is being used in rural British Columbia (Parfitt, 2016). However, as this project is still in progress, few results have been published to date. So far, its contributors have highlighted the need for standardization among different Open Data producers (Hoodicoff, 2017) and the need for a greater discussion around the ethical use of data by individuals and groups collecting it (Godbout, 2018).

2.5 Potential Future Research

Several avenues exist for future research, and in general, Kitchin (2014) supports additional research at all levels of analysis. This research may include philosophical inquiries into the concept of Open Data, how it relates to and will relate to the political, social, and economic spheres (among others), and the ethical and moral implications of emerging data technologies. It can also encompass detailed analyses of specific data projects in various countries, cities, and organizations. He further notes the potential for comparative research among these different locales and contexts to better understand how data infrastructures and systems are or may be used.

Within Canada, Kitchin’s prescription appears to apply, with much research work remaining to be done. In the public sphere, there are few academic examinations of current or past Open Data initiatives at any level or agency of government. Although there are common conceptions regarding them, the capacities across governments and geographies (such as between urban and rural areas) for new data initiatives remain largely unknown as well. In addition, while several diverse views on data and its relevance and impact in modern public life exist, these often remain claims and not the focus of experiments. Potential exists to study the truth of these arguments among public servants, planners, and those involved in discussions surrounding new data technologies.

Based on the above literature review, it appears that there are many avenues to explore regarding the use of data in planning and developing communities. It seems appropriate,
therefore, to conduct the investigation outlined in this paper surrounding the use of Open Data projects in rural communities in Ontario. No similar work exists on this subject in this context, and questions remain regarding the apparent divergence between large urban centres and smaller towns and townships within the province. This work is largely exploratory in nature, seeking to assess the current state of Open Data in Ontario and identify what has occurred thus far.
3 Methodology

In order to assess the current state of Open Data and its implementation in rural Ontario’s communities, this research consisted of two major components: a survey and a series of key informant interviews. Each of these methods are described below. This research acquired approval from the University of Guelph’s Research Ethics Board on March 1, 2018. The certificate of approval is attached in Appendix A of this document.

3.1 Survey Description

The survey was distributed online through the University of Guelph’s Qualtrics system in order to reach the widest possible number of respondents in a relatively short amount of time. The survey was distributed to a group of 983 municipal employees from all municipalities in Ontario (upper-, lower-, and single-tier), depending on the staff roles that were filled in each municipality. The recipient list was generated from a publicly available list of municipal employees acquired by the University of Guelph’s School of Environmental Design and Rural Development from the Association of Municipal Clerks and Treasurers of Ontario.

The recipient list included all municipal employees across the Province in the following positions:
- Chief Administrative Officers (CAOs)
- Clerks
- Librarians
- Freedom of Information Officers (FoI Officers)
- Information Technology Staff (IT Staff)

Some of these roles (such as IT Staff and FoI Officers) were chosen based on the rationale that persons in these roles may have immediate experience and involvement with their municipality’s data systems. Other roles (such as CAOs) were chosen based on the belief that, even if they had little direct exposure to municipal data systems, these persons would be able to forward the survey to the staff member in the local municipality who would be best suited to complete the survey. It was requested that, if possible, only one response be completed from each municipality.
This survey examined several aspects of municipal data use, and a full copy of the survey is included in Appendix B. A set of questions focused on municipal data storage policies, with questions such as:

- Whether data were stored in physical form, digital form, or both
- When a municipality began to store data digitally
- What reasons there were for deciding to not create a digital storage system

A second set of questions revolved around municipal Open Data portals. All municipalities were asked whether they operated such a portal. Those responding in the affirmative were then asked questions regarding their policies and operations, such as:

- What motivations or beliefs were behind establishing these portals
- Whether their portals conformed to various aspects commonly associated with Open Data, such as
  - Whether a portal was free to access
  - Whether users had to create accounts to access a portal
  - Whether data on a portal was licensed for re-use by other users
  - What format was used for data on a portal (which was used as a proxy for assessing machine-readability)
- How different sectors (business community, citizens, local council) responded to the municipality’s data portal, in 5-point Likert scale format
- What type of data was available on the municipality’s data portal (such as road network data, traffic data, climate and weather data, municipal finance data, etc.)
- Whether the municipality would like to make additional data available

Municipalities which did not operate a data portal were asked a shorter, separate set of questions about the following:

- What factors influenced the decision to not pursue an Open Data portal
- Whether any motivations may drive local interest in an Open Data portal

Most questions were presented in multiple-choice format, with some questions accepting multiple selections and others accepting only a single response. Many questions offered a selection of pre-written responses, but wherever it was deemed appropriate, an option was
provided for other responses to be entered by a participant. For example, a question about what motivations supported the creation of a data portal would suggest common motivations from the literature (such as providing information to citizens, marking a municipality as innovative, driving local economic development, or increasing governmental efficiency) but also allowed for responses to be entered by the user.

Simpler questions allowed “Yes,” “No,” and “Unsure” responses. Questions regarding the reception of an Open Data portal by the general public, the business community, and the municipal council in a given municipality allowed for a 5-point Likert scale response. A group could be said to be “very pleased,” “generally pleased,” “neither pleased nor displeased,” “generally displeased,” or “very displeased” with a data portal.

Additionally, every participant was asked to categorize his/her municipality as “Remote,” “Rural,” “Suburban,” or “Urban,” and as “Lower-tier,” “Upper-tier,” or “Single-tier.” At the end of the survey, participants were asked whether they would be interested in a follow-up interview on their experiences and views on municipal Open Data. Those responding in the affirmative were asked to provide an e-mail address or telephone number.

This survey remained open for approximately 4 months from May 2018 to August 2018. At that point, no new responses had been received for over a month and it was deemed that the survey could be closed. Although it would have been beneficial, no reminder message was sent to recipients during this period.

In total, 223 responses were started and 188 responses were recorded. However, it became apparent during the collection period that the software was set to close and collect surveys two weeks after they had been started. Upon investigation, 138 surveys were undertaken to completion. Additionally, a design flaw at the end of the survey led to some responses being marked as incomplete due to the user closing the survey without acknowledging the survey’s final message stating that the survey was completed. Therefore, a further 10 surveys in which over 90% of the questions were answered were also included in the tabulated results. These 10 surveys still contained all relevant answers from participants for the purposes of this project’s data analysis. This results in 148 survey responses being accepted, which gives a response rate of
15.06% (148/983). However, these responses represented 148 different municipalities, and thus they comprise 33.33% of Ontario’s 444 municipalities.

### 3.2 Interview Format Description

The results of the survey provided a list of 43 potential candidates who self-identified as being willing to participate in follow-up interviews. These candidates worked in a variety of communities which can be stratified by the following criteria:

- Community type (remote, rural, suburban, or urban)
- Region of Ontario (northern, southwestern, southeastern, Greater Toronto Area)
- Tier level (Upper-tier, Lower-tier, Single-tier)
- Whether the community maintains a local data portal

Based on these criteria, a shortlist of 12 interviewees was generated. The municipalities represented by these interviewees included 8 municipalities which self-identified as “rural,” 2 which self-identified as “remote,” and 2 which self-identified as “urban,” though the two urban municipalities were situated further from large urban centres and were considered urban by virtue of being the largest population centres in their area. This point will be discussed further in the next chapter. This shortlist of interviewees also included representatives from regions across Ontario, with 4 from southwestern Ontario, 4 from southeastern Ontario, and 4 from northern Ontario. There were 6 single-tier municipalities, 4 lower-tier municipalities, and 2 upper-tier municipalities. Finally, 9 of these interviewees had indicated that their municipalities had already established an Open Data portal, while the remaining 3 indicated that their municipalities had not done so.

E-mails invitations were sent to these 12 potential interviewees to request a time for an interview. A document including an information letter and a consent form was attached to the invitation. Among other details, the information letter stipulated that a phone interview would last no longer than one hour and that its contents would remain confidential and only be used for this project.
While a phone interview was suggested as the preferred option, an alternative option was provided in which a list of open-ended, long-response questions would be sent to the interviewees for completion if the interviewee’s schedule did not permit a phone interview. Of the 12 invited interviewees, 5 participated in phone interviews and 4 chose to respond to a prepared list of questions at their own pace, yielding 9 interviews in total conducted between July 2018 and August 2018. Of the phone interviews, the longest interview was 35 minutes long, and the shortest interview was 10 minutes long.

The questions posed in these interviews were different for each interview and were designed based on the survey results from each municipality. However, at a lower resolution, the interview questions were similar among municipalities which had already established an Open Data portal. These interviews asked representatives to recount how their communities came to develop their Open Data portals. Interviewees were asked whether their community had received any aid from other organizations or governments, and whether a particular person had spearheaded the initiative. More broadly, these interviews also asked participants whether there were issues surrounding the sharing and use of data between communities, what their hopes for their communities’ data portals were, and whether there were any successful stories in their communities which they could share. Although it did not occur, all participants were asked whether they were open to a small amount of follow-up discussion if it was needed, and all participants were open to the possibility.

For communities which had not established an Open Data portal, the interview questions posed were also similar as a group. These questions included whether the interviewees felt that there was adequate support for Open Data work at the municipal level in Ontario, as well as whether there was an interest for this work in the interviewee’s municipality. Additionally, participants were asked whether they felt that the Province was supportive of this work and whether they felt that Open Data would be an important area of focus for their community in the future.

The results of these interviews were transcribed in accordance with the ethics procedure approved by the University of Guelph’s Research Ethics Board. The main themes and responses obtained from the interviews are summarized in the following chapters.
4 Results

This chapter presents the results of the survey with some additional commentary. This includes tables showing statistically significant results, whereas statistically non-significant results are simply discussed in the text. Results of the survey are presented first, followed by results from research interviews.

4.1 Survey Results

From the results of the survey, some assessments can be made about the state of data usage in municipalities across Ontario. I will begin by providing overarching information about the distribution of respondents. Afterwards, I will present the statistics garnered about municipal data systems more broadly and then shift to results regarding Open Data.

4.1.1 Survey Respondents

The respondents to the survey largely considered their communities to be rural areas. Of the 148 survey responses, 90 self-identified as rural areas, with the remainder self-identifying as urban (33 responses), suburban (18 responses), and remote (4 responses). This breakdown is illustrated in Figure 4-1. Adding these results, there were 3 respondents which did not select an answer. Generally, this distribution appeared to follow the expected relation between size of community and self-identification, with denser areas tending to identify as urban or suburban, and sparser areas identifying as rural or remote.
There were some exceptions to this, however. For instance, a community in excess of 100,000 in population self-identified as rural, likely based on its proximity to larger cities. As well, some centres of a few thousand self-identified as urban areas, most likely since they are the largest population centres in their respective areas. However, these remain exceptions to the rule and are not expected to have a large impact on this study’s analysis, and so they have not been removed or altered.

Regarding the types of municipalities, the responses predominantly came from lower-tier municipalities, with 88 responses in this category. Single-tier municipalities contributed 38 responses, and upper-tier ones contributed 19 responses. This leaves 3 respondents which did not select a response. These results are shown in Figure 4-2 below. Although lower-tier municipalities predominate, they are also the most common type in Ontario, numbering 241. This gives a response rate of 36.5% in that category. In comparison, the above numbers mean that 21.9% of the Province’s 173 single-tier municipalities and 63.3% of the Province’s 30 upper-tier municipalities had submitted responses.
4.1.2 Results Surrounding Municipal Data Practices

Questions surrounding how data is stored at the municipal level shed light on the day-to-day operations in these municipalities. In response to a question about whether local records were kept primarily in digital formats, primarily in physical formats, or in a combination of the two, 30 respondents indicated primarily digital record storage, 9 indicated primarily physical record storage, and 106 indicated a combination of the two. If it is assumed that the use of digital record storage is an indication of a well-equipped municipality, then these results suggest that Ontario’s municipalities have largely been able to meet their needs for local data management.

A Chi-Square test can be used to test for a divergence among different types of communities. However, because of the low numbers of remote and suburban communities responding in this survey, it becomes difficult to reliably analyze the results based on the different types of communities. Chi-Square tests generally become unreliable when over 20% of the expected cell counts are below 5, or when any of them are below 1. To address this, remote and rural communities are grouped together into a single category, and suburban and urban communities are grouped together into another category. This allows for better statistical analysis but is also based on the assumption that the characteristics of rural and remote areas are more similar to each other than to other types of communities, and that urban and suburban areas are also relatively similar in character to each other in comparison to more rural areas. This
appears to be generally supported by rapid urbanization in Canada and stagnant or negative growth outside of urban centres. However, I recognize that this remains an assumption which is made to aid in statistical analysis.

After condensing the respondents into two categories, a Chi-Square test yields results that are significant at the 5% level. In this case, among rural and remote areas, more than expected report having primarily physical records, and less than expected report having a mix of digital and physical storage. A different trend occurs in urban areas, where very few communities report having primarily physical records, and plenty report a mix of digital and physical storage. These results are shown in Table 4-1.

Table 4-1 Chi-Square test results comparing data storage methods by type of community

<table>
<thead>
<tr>
<th>Crosstab</th>
<th>Some municipalities keep their municipal records in a digitized/computerized format, whereas others maintain physical copies of their records. Which of the following best describes your municipality?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primarily physical storage</td>
</tr>
<tr>
<td>Which of the following best describes your municipality?</td>
<td>Rural/Remote</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
<tr>
<td></td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>7.967*</td>
<td>2</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>8.990</td>
<td>2</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>6.318</td>
<td>1</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>145</td>
<td></td>
</tr>
</tbody>
</table>

*1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.17.
It may be inferred from these results that rural areas are at a disadvantage in comparison to their urban counterparts. However, there may be a more reasonable explanation for this divide between community types, and other survey results may provide context for this. To gain more insight into this issue, respondents were also asked whether their municipality had digitized any records in 2017, and of 144 responses, 80 (55.56%) responded affirmatively, 53 (36.81%) responded negatively, and 11 (7.64%) were unsure.

Those who indicated that their municipality did not digitize records in 2017 and those relying on physical storage were then asked what factors prevented moving to a digital system. There were 70 of these respondents, and as seen in Figure 4-3, their reasons are largely related to internal capacity via human and financial resources. The largest issues noted were a lack of staff or time (78.57% and 74.29%, respectively) available to work on moving to a digital system, with a lack of financial resources close behind (62.86%). A lack of technical training was mentioned by 40.00% of respondents. A relatively small percentage (17.14%) said that there was instead a desire to maintain the system as it was, with some respondents commenting that there was no discernible advantage to transitioning to a digital system or that physical records were preferred for the sake of security. 4.29% also specified internal reluctance from certain departments to digitizing data as an additional reason. Although these two latter figures are not an insignificant portion of the respondents, these results suggest that a large amount of municipalities, particularly in more rural areas, are faced with a lack of resources that impede their operations. This is occurring against the backdrop of relative technical progress, with 79.31% of surveyed municipalities already using primarily digital storage or a combination of digital and physical systems.
Figure 4-3 Reasons given for a municipality not digitizing municipal records

Taking a more numerical approach, each of these factors can be assessed using Chi-Square tests among different community types and different municipal tiers. These only yield statistically significant results at the 5% level in one case. It appears that the issue of a lack of staff available has varied relevance among different municipal tiers. Lower-tier and single-tier municipalities are more likely to select this as a factor than upper-tier municipalities. These results are tabulated in Table 4-2. Given that upper-tier municipalities may have access to broader and deeper pools of resources, this is not a surprising result, and it may be rather natural to see this divergence. This result does, however, call attention to single-tier municipalities which may have similar needs to upper-tier municipalities but which may not always have the same levels of support and resources.
Table 4-2 Chi-Square test results comparing municipal tier to lack of staff as a reason for not digitizing data systems

Crosstab

<table>
<thead>
<tr>
<th></th>
<th>Lack of staff available to address this issue</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is not a factor</td>
<td>Is a factor</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Which of the following categories best fits your municipality?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-Tier</td>
<td>6</td>
<td>32</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>8.1</td>
<td>29.9</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>Single-Tier</td>
<td>4</td>
<td>21</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>6.4</td>
<td>19.6</td>
<td>26.0</td>
<td></td>
</tr>
<tr>
<td>Upper-Tier</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>1.5</td>
<td>5.5</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>55</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>15.0</td>
<td>55.0</td>
<td>70.0</td>
<td></td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>11.549a</td>
<td>2</td>
<td>0.003</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>9.234</td>
<td>2</td>
<td>0.010</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>5.961</td>
<td>1</td>
<td>0.015</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 1.50.

Another survey question asked those municipalities which had indicated some use of digital record storage in what year they began storing data digitally. The results are shown in Figure 4-4 and are fairly evenly distributed. A sizable number (21) report transitioning to digital storage prior to the year 2000. Each year between 2000 and 2018 having a smaller number of responses, with 62 respondents choosing years in this range. The highest of these was in 2010, selected by 11 respondents, whereas 2 years, 2002 and 2018, had 0 respondents. It is unclear whether the uptick in 2010 was simply an anomaly or was caused by any external event such as a government policy or initiative. 24 respondents were unsure of this information. There were an additional 8 respondents who were asked this question but chose not to answer, and it is not clear whether they were unsure of how to respond or elected to not answer for another reason.
4.1.3 Results from Communities with Open Data Portals

The survey asked respondents whether their municipalities had established an Open Data portal. Although a brief description was provided, some interpretation around what constituted an Open Data portal could have still have been a factor in the responses obtained. Among 144 responses, 47 (32.64%) responded affirmatively, 95 (65.97%) responded negatively, and 2 (1.39%) were unsure.

This result in itself is not particularly interesting, but Chi-Square tests reveal more. To more reliably analyze these results and avoid low expected cell counts, those without Open Data portals and those who were unsure whether their municipality had an Open Data portal were grouped together in a single category. When assessing these results by type of community and by municipal tier, both outcomes are statistically significant well below the 5% level. In a trend similar to that of the above results regarding data storage, rural and remote areas report having Open Data portals less often than expected. The reverse is true among urban and suburban areas, which are more likely to have established Open Data portals. This breakdown is provided in Table 4-3.
Table 4-3 Chi-Square test results comparing presence of data portals based on type of community

<table>
<thead>
<tr>
<th>Crosstab</th>
<th>Does your municipality maintain a data portal on or as part of its website?</th>
<th>Yes</th>
<th>No/Unsure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which of the following best describes your municipality?</td>
<td>Rural/Remote</td>
<td>22</td>
<td>73</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>31.4</td>
<td>63.6</td>
<td>95.0</td>
</tr>
<tr>
<td></td>
<td>Urban/Suburban</td>
<td>26</td>
<td>24</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>16.6</td>
<td>33.4</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
<td>97</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>48.0</td>
<td>97.0</td>
<td>145.0</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>12.306</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correction</td>
<td>11.036</td>
<td>1</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>12.065</td>
<td>1</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td></td>
<td></td>
<td>.001</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>12.221</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>145</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.55.

b. Computed only for a 2x2 table

Among different municipal tiers, another clear divergence occurs, with the breakdown shown in Table 4-4. Lower-tier municipalities report having Open Data portals less often than expected, whereas upper-tier municipalities do more often than expected. Single-tier municipalities reported having Open Data portals at roughly the rate that was expected. Given that the lower-tier often has access to less resources and covers a smaller geographic area than the upper-tier, it is not unexpected that the upper-tier would be more likely to establish Open Data portals. Indeed, it may be in the interest of lower-tier municipalities to let upper-tier municipalities pursue these projects on their behalf.
**Table 4-4 Chi-Square test results comparing presence of data portal based on municipal tier**

**Crosstab**

<table>
<thead>
<tr>
<th>Which of the following categories best fits your municipality?</th>
<th>Lower-tier</th>
<th>Count</th>
<th>Expected Count</th>
<th>Single-tier</th>
<th>Count</th>
<th>Expected Count</th>
<th>Upper-tier</th>
<th>Count</th>
<th>Expected Count</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your municipality maintain a data portal on or as part of its website?</td>
<td>Yes</td>
<td>21</td>
<td>28.7</td>
<td>13</td>
<td>12.4</td>
<td>13</td>
<td>5.9</td>
<td>47</td>
<td>47.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No/Unsure</td>
<td>67</td>
<td>59.3</td>
<td>25</td>
<td>25.6</td>
<td>5</td>
<td>12.1</td>
<td>97</td>
<td>97.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>88</td>
<td>88.0</td>
<td>38</td>
<td>38.0</td>
<td>18</td>
<td>18.0</td>
<td>144</td>
<td>144.0</td>
<td></td>
</tr>
</tbody>
</table>

**Chi-Square Tests**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>15.953a</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>15.092</td>
<td>2</td>
<td>.001</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>13.834</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>144</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.88.

There may be concern for single-tier municipalities on this topic. It may be that some would be unable to pursue Open Data projects independently and yet, unlike lower-tier municipalities, they would not have immediate collaborators with which to pool resources. Although the group of single-tier municipalities did not exhibit this in comparison to other municipal tiers, this may be a real concern among rural and remote areas which are relatively low in population, staff, and resources. However, a Chi-Square test analyzing single-tier municipalities by community type was not found to be statistically significant at the 5%
confidence level. Thus, it cannot be concluded that rural and remote single-tier municipalities are at a notable disadvantage.

Communities possessing Open Data portals were also asked what motivations inspired the creation of their portals. Four default options were provided and other reasons could be specified if desired. The results from this question are shown in Figure 4-5. Here it appears that providing public access to data is the most-common cause for establishing a portal, with 83.33% of respondents selecting this. Improving the efficiency of government (66.67%) and branding a community as “forward-thinking” or “innovative” (64.58%) were also selected by a large number of respondents. Perhaps surprising, pursuing economic development (50.00%) was the least-chosen of these options.

![Reasons for Establishing an Open Data Portal]

**Figure 4-5 Reasons given by municipalities for establishing an Open Data portal**

There is also a potential for a rural-urban or tier-based divide in these reasons, and therefore it is appropriate to apply Chi-Square tests to each of these reasons individually between different community types and municipal tiers. However, these tests only find results that are statistically significant (at the 5% level) for a desire for governmental efficiency among different types of communities. Rural and remote areas appear less likely to pursue Open Data with the goal of improving governmental efficiency, and urban and suburban areas appear more likely to do so. These results are listed in Table 4-5. All other factors and cases were found to not be statistically significant at the 5% level.
Table 4-5 Chi-Square test results comparing type of community to government efficiency as an incentive to developing an Open Data portal

<table>
<thead>
<tr>
<th>Crosstab</th>
<th>A belief that this portal will improve efficiency within local government</th>
<th>Was not a factor</th>
<th>Was a factor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural/Remote</td>
<td>Count</td>
<td>12</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Expected Count</td>
<td>7.3</td>
<td>14.7</td>
<td>22.0</td>
<td></td>
</tr>
<tr>
<td>Urban/Suburban</td>
<td>Count</td>
<td>4</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>Expected Count</td>
<td>8.7</td>
<td>17.3</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>16</td>
<td>32</td>
<td>48</td>
</tr>
<tr>
<td>Expected Count</td>
<td>16.0</td>
<td>32.0</td>
<td>48.0</td>
<td></td>
</tr>
</tbody>
</table>

**Chi-Square Tests**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>8.224*</td>
<td>1</td>
<td>.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correction</td>
<td>6.556</td>
<td>1</td>
<td>.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>8.464</td>
<td>1</td>
<td>.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher’s Exact Test</td>
<td></td>
<td></td>
<td>.006</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>8.052</td>
<td>1</td>
<td>.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td></td>
<td></td>
<td>48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.33.

b. Computed only for a 2x2 table

Another question asked what type of data each municipality made available on their Open Data portals. The distribution of these results is provided in Figure 4-6. A great majority of municipalities report providing recreational data (83.33%), referring to items such as trail locations and permitted uses. Municipal office data (such as locations or hours of operation) and land use planning data (such as Official Plans and zoning information) were the second-most selected (68.75% each), and were followed by economic/business data (66.67%), transportation/traffic data (62.50%), and demographic data (56.25%). The least-commonly selected types were environmental/conservation data (35.42%), agricultural/farm data (18.75%), and climate/weather data (10.42%).
Figure 4-6 Distribution of types of data cited as available on Open Data portals by respondents

This information can be contrasted with a similar question about types of data which municipalities would like to make available in the future. These results are given in Figure 4-7. The most-commonly selected type here was municipal finance data (41.67%), which ranked in the middle of the previous set of data. Economic/business data (29.17%), demographic data (27.08%), historical data (25.00%), and transportation/traffic data (22.92%) also saw relatively high rates of selection. In the previous chart, these, respectively, were ranked 4th, 6th, 7th, and 5th. The least-chosen types included recreational data (12.50%), tourism data (12.50%), climate/weather data (12.50%), and municipal office data (10.42%). In the previous chart, these were ranked 1st, 9th, 12th, and 2nd, respectively.

From this, one can infer that there are some types which have largely reached saturation, such as recreational and municipal office data: they are generally provided and municipalities are not seeking to make more of them available. Other types are currently lacking, such as municipal finance, demographic, and historical data, which are currently provided in low numbers at the moment and are often sought to be made available. Still others are generally well-sought-out, like land use planning data, economic/business data, and transportation/traffic data, which are often made available and still desired in higher amounts. Finally, there is other data that is generally not popular, such as tourism data, environmental data, agricultural/farm
data, and climate/weather data, which are currently only provided by a few municipalities and are often not desired to be made available either.

![Diagram showing types of data to be made available]

**Figure 4-7 Distribution of types of data that municipalities seek to make available**

The survey also asked why a municipality was seeking to make additional data available. There were 4 stock answers provided, with multiple selections allowed, and with the ability to enter additional reasons as well. As seen in Figure 4-8, most of these cases involve interest from the municipal council or staff in making more data available, with 77.08% of respondents stating that this is a factor. Requests from citizens (43.75%) and from the business community (31.25%) were also regularly selected. A small number (6.25%) mentioned requests from the federal or provincial government.

![Diagram showing reasons for wanting to make more data available]

**Figure 4-8 Reasons given for wanting to make additional data available**

42
Respondents were also asked whether there were any factors leading to data not being made available, and these results are shown in Figure 4-9. Five general options were provided with multiple selections allowed, and additional answers could be entered as well. The primary reason selected was insufficient staff, chosen by 68.75% of respondents. Concerns around privacy were also a major factor, being chosen by 50.00% of respondents. The remaining reasons given were a lack of access to data (20.83%), uncertainty around the ownership of data (16.67%), and a lack of technical training (16.67%). The fact that insufficient staff ranks quite highly here is consonant with Figure 4-3, where this was also listed as a reason for a lack of digitizing data. In Figure 4-3, a lack of technical training was still a notable factor, whereas here it is a relatively small issue. This may be because the question in Figure 4-9 was asked of municipalities which had already established Open Data portals, meaning that they likely already have the requisite technical capacity for this type of work.

![Reasons for Not Making Data Available](image)

**Figure 4-9 Reasons given for not making more data available**

Concerning the Open Data portals claimed by these municipalities, it may be asked whether these fit common definitions of Open Data such as the Open Definition 2.1 (Open Definition, n.d.). Questions in the survey asked respondents whether their Open Data portal conformed to several common criteria ascribed to Open Data. Based on the results, all municipalities provided their Open Data services free of charge, and almost all municipalities involved (47 of 48, 97.92%) offered access to their Open Data portal without requiring registration. 38 of 48 (79.17%) allowed reuse of Open Data for any purpose, and 28 of 48 (58.33%) allowed reuse of data without citing the original source. From these figures, it appears that most Open Data portals are in line with the principles of Open Data. In the case of allowing
reuse without citation, although this figure was lower than the others, this is not often cited as a key requirement for Open Data, and many definitions of Open Data allow for this stipulation, such as that of Pollock (2006).

An important feature for Open Data is machine-readability, meaning that data can be automatically processed by a computer algorithm without human guidance (Poikola et al., 2012). PDFs (files ending in .pdf) and Image files (.gif, .jpg, .tiff, etc.) are commonly-cited forms of non-machine-readable (or human-readable) data, whereas comma-separated value (CSV) files (ending in .csv) and JSON files (.json) are generally favoured machine-readable file types. Given that many respondents may not be familiar with the term “machine-readable data” or may not be sure what data qualifies as machine-readable, a survey question instead asked what file types were made available on a municipality’s Open Data portal, with 10 stock answers and the ability to enter additional answers provided.

The results are listed in Figure 4-10, which shows that PDFs are the most-commonly used single file type, with 66.67% selecting this response. However, image files have a relatively low usage (20.83%). Some machine-readable formats such as CSV files, JSON files, Excel files (.xls, .xlsx), HTML files (.html), and XML files (.xml) are still used by notable portions of municipalities, with these file types ranging from 22.92% to 58.33% in reported usage. From this, one can infer that, although machine-readable data is not the universal standard in Ontario, there is still a healthy practice of providing a number of file types among municipalities.
4.1.4 Results from Communities Not Possessing Open Data Portals

The survey posed two additional questions to respondents who indicated that their municipality did not possess an Open Data portal. This was to determine whether these communities were simply not interested in the idea or were interested but restricted from pursuing the idea. This group was first asked whether any of a given list of factors prevented their adoption of Open Data; the results are provided in Figure 4-11. Among 97 municipalities, 32 (32.99%) had never discussed Open Data and 4 (4.12%) stated that pursuing Open Data simply did not appear worthwhile. For these municipalities, it appears that their priorities lie elsewhere and they are not particularly receptive to the concept of Open Data. Looking to other reasons, a majority of these municipalities (57.73%) are wrestling with insufficient staff, and a lack of financial resources is an obstacle for over one third (36.08%) of respondents. Over one fifth (22.68%) also experience a lack of technical training or capacity. These results show that there are municipalities present which are interested in pursuing Open Data but do not have the necessary resources for this work.
Figure 4-11 Reasons selected for not establishing an Open Data portal

Applying Chi-Square tests to each of these factors finds statistically significant findings at the 5% level for many factors among different types of communities. Rural and remote areas reported concerns around privacy, insufficient staff, a lack of financial resources, and a lack of technical training as being obstacles to developing an Open Data portal at lower rates than expected. Among urban and suburban areas, these factors were all reported more than expected. The opposite trend was seen in relation to whether a municipality had discussed the topic of an Open Data portal. Rural and remote areas had discussed this topic less than expected, whereas urban and suburban areas were more likely to have discussed it.

It appears that these findings are related and are due to the characteristics of the survey question (Question 3.18 in Appendix B). This question offered 8 options: 6 of these were issues that may be preventing construction of an Open Data portal, 1 was that a data portal did not appear to be a worthwhile investment, and 1 was that this issue had never been discussed. These latter two options were exclusive, meaning that if one of them was selected, no other options could be selected. However, the remaining 6 options were non-exclusive. Therefore, a significant finding in one of the exclusive choices may adversely sway the findings among non-exclusive choices and may produce a false positive result. Given that the opposite trends occur between the exclusive and non-exclusive choices, there is some reason to believe that this has
occurred. It appears that the reverse phenomenon cannot happen, or if it can, it is less likely to do so.

In light of this, the Chi-Square tests for concerns about privacy, insufficient staff, a lack of financial resources, and a lack of technical training do not appear reliable, and I do not include their tables in this section. I include the results on whether a municipality had discussed an Open Data portal in Table 4-6, although of all results listed in this section, these have the least credence. As a final note related to this question, no factors were found to be statistically significant at the 5% level among different municipal tiers.

**Table 4-6 Chi-Square test results comparing type of community to whether a community had discussed pursuing an Open Data portal**

<table>
<thead>
<tr>
<th>Crosstab</th>
<th>My municipality has never discussed the idea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural/Remote</td>
<td>Count</td>
<td>Was not selected</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>Was selected</td>
</tr>
<tr>
<td>Urban/Suburban</td>
<td>Count</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>16.1</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>65.0</td>
</tr>
</tbody>
</table>

**Chi-Square Tests**

<table>
<thead>
<tr>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>6.056</td>
<td>1</td>
<td>.014</td>
<td></td>
</tr>
<tr>
<td>Continuity Correctionb</td>
<td>4.887</td>
<td>1</td>
<td>.027</td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>6.836</td>
<td>1</td>
<td>.009</td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td></td>
<td></td>
<td>.014</td>
<td>.011</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>5.994</td>
<td>1</td>
<td>.014</td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.92.
b. Computed only for a 2x2 table

47
These municipalities were also asked whether they would be interested in establishing an Open Data portal for any of a given list of reasons. These results are listed in Figure 4-12. Of 97 respondents, 11 (11.34%) indicated that an Open Data portal did not appear to offer any benefit to their community. However, 65 (67.01%) stated that providing citizens access to data was a reason for interest in the idea, making this the leading reason given. Increasing governmental efficiency (49 respondents, 50.52%), improving the community’s brand/image (42 respondents, 43.30%), and boosting economic development (42 respondents, 43.30%) were also selected by sizable numbers of communities.

<table>
<thead>
<tr>
<th>Reasons for Interest in Establishing an Open Data Portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to data</td>
</tr>
<tr>
<td>Governmental efficiency</td>
</tr>
<tr>
<td>Community branding</td>
</tr>
<tr>
<td>Economic development</td>
</tr>
<tr>
<td>Does not appear beneficial</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>0.00%</td>
</tr>
<tr>
<td>67.01%</td>
</tr>
</tbody>
</table>

Figure 4-12 Reasons for interest in Open Data by communities that do not possess Open Data portals

Chi-Square tests were applied to each of these factors to see if any predominate in particular communities or municipal tiers. These tests return two results that are statistically significant at the 5% level, though they both occur under the lens of different municipal tiers. First, it appears that upper-tier governments tend to see Open Data more as a tool for economic development, and lower-tier municipalities tend to do so less. These results are listed in Table 4-7. Secondly, upper-tier and single-tier municipalities tend to see value in Open Data as a means for improving governmental efficiency, whereas lower-tier governments do so less often. These test results are shown in Table 4-8. On a technical note, these results have rather high percentages of cells with low expected cell counts, and therefore the results may not be entirely reliable. However, it does not appear possible to condense the tier categories due to the intrinsically different natures of lower-, single-, and upper-tier municipalities.
Table 4-7 Chi-Square test results comparing municipal tier to economic development as an incentive for interest in Open Data

Crosstab

<table>
<thead>
<tr>
<th>Which of the following categories best fits your municipality?</th>
<th>Economic Development</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is not an incentive</td>
<td>Is an incentive</td>
</tr>
<tr>
<td>Lower-Tier</td>
<td>Count</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>38.0</td>
</tr>
<tr>
<td>Single-Tier</td>
<td>Count</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>14.2</td>
</tr>
<tr>
<td>Upper-Tier</td>
<td>Count</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>2.8</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>55.0</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>6.904</td>
<td>2</td>
<td>.032</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>8.729</td>
<td>2</td>
<td>.013</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>2.924</td>
<td>1</td>
<td>.087</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>97</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 2 cells (33.3%) have expected counts less than 5. The minimum expected count is 2.16.
Table 4-8 Chi-Square test results comparing municipal tier to improving governmental efficiency as an incentive for interest in Open Data

<table>
<thead>
<tr>
<th>Crosstab</th>
<th>Improving Efficiency</th>
<th>Is not an incentive</th>
<th>Is an incentive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67</td>
</tr>
<tr>
<td>Lower-Tier</td>
<td>Count</td>
<td>38</td>
<td>29</td>
<td>67.0</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>33.8</td>
<td>33.2</td>
<td></td>
</tr>
<tr>
<td>Single-Tier</td>
<td>Count</td>
<td>11</td>
<td>14</td>
<td>25.0</td>
</tr>
<tr>
<td>Upper-Tier</td>
<td>Count</td>
<td>0</td>
<td>5</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>2.5</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>49</td>
<td>48</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>49.0</td>
<td>48.0</td>
<td>97.0</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>6.550*</td>
<td>2</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>8.495</td>
<td>2</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>5.469</td>
<td>1</td>
</tr>
</tbody>
</table>

4.2 Interview Results

Included below are general observations from the 9 interviews conducted with municipal staff members from 9 different municipalities. As detailed in the methodology, two general sets of questions were created for municipalities with and without Open Data portals. This allows for comparison between responses to similar questions. I will begin by providing overarching commentary on the interview process and results, including the distribution of interviewees. I will then present four main themes that arise: catalysts which appear to help municipalities interested in Open Data, benefits of Open Data mentioned by interviewees, obstacles to Open Data initiatives mentioned in interviews, and needs of communities which might or might not be addressed.
4.2.1 Overarching Commentary

To preserve anonymity while still providing continuity throughout the report, the interview subjects are numbered from 1 to 9. These numbers reflect the chronological order in which interviews were conducted. Subjects 1, 2, 3, 5, and 7 indicated that their municipalities possessed Open Data portals. Subjects 1 and 5 were from municipalities identified as urban; Subjects 2, 3, 4, 6, and 9 were from municipalities identified as rural; and Subjects 7 and 8 were from municipalities identified as remote. Subjects 1, 3, and 9 were from lower-tier municipalities; Subjects 2 and 6 were from upper-tier municipalities; and Subjects 4, 5, 7, and 8 were from single-tier municipalities. Subjects 1, 2, 3, 7, and 8 were interviewed by phone, while subjects 4, 5, 6, and 9 opted to answer questions in writing.

One of the challenges in discussing the topic of Open Data and in conducting these interviews was to come to a common understanding of what Open Data is. Interviews were designed based on the results of the survey, including whether a municipality indicated that it had established an Open Data portal. However, verifying that such a portal existed beforehand was sometimes difficult, requiring confirmation at the beginning of some interviews. While the municipalities of Subjects 1, 2, and 3 possessed Open Data portals, Subject 1’s portal was difficult to find from the main website. Subject 7’s municipality indicated in their survey that they had a portal, but this person commented that this largely referred to the municipality’s general website, although a separate site for Geographic Information System (GIS) data also existed. Finally, Subject 5’s municipality stated in its survey response that a portal existed, and Subject 5 requested a set of interview questions for a written response. In this response, it was stated that the municipality did not have an Open Data portal, but also that a local GIS portal may count as such. Due to time constraints on the part of the interviewee, this could not be clarified to rectify the misunderstanding.

4.2.2 Catalysts for Open Data

Subjects 1, 2, and 3 were all drawn from municipalities with Open Data portals, and all mentioned software as an important driver in establishing these systems. They commented that GIS software used in their municipalities provided the option to create an Open Data portal, and
this allowed information to easily be released to the public. In essence, aspects of the platform which the municipality was already using could be opened up to public access. On this topic, Subject 2 commented, “We figured there was no reason that it shouldn’t be open.” Subject 3 noted in particular that having data available at the outset aided in attaining approval from other departments and from municipal council. However, Subject 3 also commented that some data had to be parsed through in order to ensure it was fit for release, especially its metadata, meaning aspects of a dataset which provide information for the user about the data (such as column headings, titles, or counts of pieces of data). As well, Subject 3 noted that while it was initially easy to make GIS data available, there is a strong desire to include other data, such as municipal finance data.

In a similar vein, Subjects 2 and 3 also noted that low cost options for Open Data were critical. Subject 3 explained the ease of gaining local approval for a project with minimal costs beyond staff hours required. As well, Open Data work in Subject 2’s municipality was part of a wider initiative focused on updating civic technology and expanding digital technologies in the municipality. It is not clear that this work would have been as successful or thorough without a more expansive initiative.

Some projects were found to rely on collaboration with another municipality or with other agencies. Subject 2’s municipality had, in addition to a municipal Open Data portal, a collaborative Open Data website shared with the neighbouring municipality and several local social service organizations. Subject 2 offered an example of a benefit from this service in that it allowed residents of either municipality to see where the closest location was to obtain medical or social services, and that this could be in a different municipality from their own. This may not have been apparent to users if the data portal was not a collaborative system. As well, Subject 3 explained a different way for collaboration to be a catalyst: after the municipality had created its data portal, some of its staff became engaged in discussions with neighbouring municipalities which did not have data portals. Although some neighbouring staff had little understanding of the concept of Open Data, they began to be exposed to these ideas through conversations with staff from Subject 3’s municipality. Thus, although none of these neighbouring municipalities
have invested in Open Data yet, these cases show that Open Data initiatives can occur in clusters and spread through word-of-mouth.

In addition, some areas which did not possess Open Data portals were open to the idea and to collaboration with others, either from other municipalities or other agencies. Subjects 4, 6, 8, and 9 all spoke favourably of these ideas, although they generally saw more potential in working with other municipalities. Subject 4 noted that any public-private initiative would need to be thoroughly investigated, Subject 6 opined that data-sharing agreements would require thorough reviewing, and Subject 9 stated that any proposal from a non-governmental organization could be considered but commented that demand for such a proposal appeared to be low, if not non-existent.

Two more of these catalysts arose from these discussions. First, Subject 2 mentioned the usefulness of having a goals-oriented approach, commenting that many local initiatives are driven first by an identified need rather than a theoretical idea. This observation is in line with other studies in the recent literature on Open Data adoption (Conradie & Choen, 2014; Urbanski, 2013). As well, Subject 3 was integral in the municipality adopting Open Data as this person initially pursued Open Data as a side project of personal interest. Interest among local staff appears to be a key factor, as Subject 8 mentioned the challenges of developing an Open Data system without support from local staff. Generally speaking, it appeared that Subjects 2 and 6 were also deeply knowledgeable about Open Data and were strong assets for their communities in doing this work.

### 4.2.3 Perceived Benefits of Open Data

One of the commonly cited benefits of Open Data is an increase in government efficiency (Heller, 2017; Janssen, Charalabidis, & Zuiderwijk, 2012), and Subjects 1, 2, and 7 all made references to increasing efficiency through changes in data use. Subject 1 mentioned this in multiple contexts. First, a well-designed and integrated Open Data platform can save time and money in data transactions which often require staff attention; one area for this potential is in developing Financial Information Return forms, which are usually compiled manually but which could in theory be organized automatically, on an ongoing basis, with a more sophisticated data
system. Second, a more open (and specifically, a more integrated) system of municipal
government throughout the Province (or even the country) could allow better cross-comparison
between municipalities to identify relative areas of inefficiency. Lastly, Open Data systems
could reduce more litigation-oriented issues by increasing transparency in government
operations. It was argued that this would give the government greater legitimacy to move
forward with its mandate and accomplish tasks.

The topic of efficiency arose in discussion with Subject 2 through the aforementioned
collaborative Open Data site. This improved communication and coordination between the
municipalities, different organizations, and the public. In Subject 7’s case, although the
municipality did not have an Open Data portal, the interviewee explained that discussions
around Open Data had occurred and that this person saw the topic as a way to improve service
delivery to residents and businesses.

Economic reasons for Open Data have also been put forward (The Economist, 2013;
Verwayen, Arnoldus, & Kaufman, 2011), and there was some evidence of this rationale in the
interviews. Subject 2 stated that although it is difficult to track the user base for the
municipality’s portal, it appeared that land development groups were major users, particularly of
road network data. Subject 2 believed that environmental groups also comprised a large number
of users, but that, overall, the use of rural Open Data tended to be more industry-based rather
than citizen-based. On a related note, Subject 2 also suggested that if the municipality could
improve its data for roads and addressing of locations (some of which was lacking in accuracy),
it could provide this information to larger data corporations such as Google, which may have an
interest in improving their own data in this area. Finally, Subject 3 also discussed the topic of
industry use, seeing industry engagement as a potential user of the municipality’s portal,
although this avenue remained to be pursued in-depth.

The potential for Open Data to improve the relationship between a level of government
and its citizens has been a key point of discussions around Open Data, particularly at the national
level (Heller, 2017). It may be asked whether this is a focus among municipal governments as
well. In these interviews, the topic of increasing citizen engagement emerged in two discussions.
Subject 2 suggested that an Open Data framework could be ideal for garnering public opinion on a municipal document such as an Official Plan. A document could be developed in real time with members of the public commenting on different aspects of it online for others to see. As well, Subject 3 hoped that developing an Open Data portal would improve citizen perception of the municipality by offering a more transparent relationship. Subject 3 also suggested that Open Data could be used in educational settings (particular in science, technology, engineering, and math streams) and discussed recently visiting a high school to promote the resource to students.

A number of interviewees were asked whether the ability to work with data, more broadly speaking, was important for their municipality’s future development. Of these, Subject 2 said that, while proficiency with data was not vital to the community’s future, it was a strong asset in which the municipality was glad to invest, both for efficiency and for inter-municipal work. Additionally, Subject 4 stated that the municipality saw value in working with data and was interested in developing their ability to do so, though it did not appear to be crucial for development. Striking a more ambivalent tone, Subject 6 related that this depended on the department in question, with some staff believing it was vital while other staff was less interested. Others were more skeptical, as Subject 5 stated that data initiatives like Open Data would likely only become of interest if ratepayers saw it as important.

4.2.4 Perceived Obstacles to Open Data

Although several benefits to Open Data were mentioned, obstacles could be found as well in these discussions. A recurring theme was the lack of clarity around what could be released to the public and what had to remain private. Subjects 8 and 9 both mentioned this as a concern, and Subject 2 also commented that ownership of information could be difficult to navigate. Subject 8 remarked that there were no clear guidelines on determining if data was public or private data, saying that some data could be released from an office location but was not eligible to be provided online or over a phone. Subject 9 voiced similar concerns, feeling confused regarding where the line existed between private and public data.

Although Subject 1’s municipality already possessed a data portal, the interviewee offered concerns around amalgamation as a potential roadblock for smaller municipalities. Given
pressures to amalgamate areas that are experiencing trouble operating independently, some municipalities may avoid any sort of collaborative work out of fear that it could ultimately justify a future amalgamation.

Discussions with Subjects 3, 4, and 6 discussed internal office support for Open Data with varied results. As mentioned above, Subject 3 was able to garner local support for an Open Data portal, but Subject 4 commented that there had not been any discussions within the municipality as long as this person had been employed there. Subject 6 stated that different departments in the municipality had wildly different experiences in working with data, with some relying on the resource and being keen to develop their capacity further, and others having challenges with tasks such as converting physical data into digital forms. This makes it difficult for the municipality as a whole to pursue an Open Data initiative.

Some subjects explained that being in a single-tier municipality increased common challenges for Open Data, particularly in small communities. Subjects 4 and 8 remarked that single-tier municipalities have access to fewer resources than usual, in terms of funding and guidance for these types of initiatives. However, Subject 5 did not believe that being in a single-tier municipality would affect the development of an Open Data project in any way.

Finally, it may be asked whether the presence or absence of broadband Internet was a major obstacle for these communities, given that Open Data is usually provided through an online platform. Surprisingly, broadband was a rare feature in these interviews, only being mentioned twice. Subject 4 commented that Internet service would be a major area of concern in the municipality and would pose problems for Open Data. Subject 7, on the other hand, stated that the municipality was fortunate to have a strong broadband network within the area and that this would not impede Open Data work there.

### 4.2.5 Community Needs

When asked about practices and support for Open Data from other levels of government, subjects gave a range of responses. Subject 2 stated that the Province generally maintained good practices regarding its own data and that the Province was easy to contact when questions arose.
Subject 3 believed that much of the support from other levels of government came through third-party organizations that provided resources, networking, and conferences, stating that these resources were very valuable in developing a local Open Data portal. However, Subjects 4, 6, 7, and 9 did not believe this was a priority for the Province, with Subject 4 stating, “If Ontario wants Open Data, Ontario has not yet seriously shown me that desire.” Subject 7 also commented that the Province was often distant on these matters and that it is often unclear what happens to data that is sent to the Province by municipalities.

Subjects 1, 3, and 6 all saw opportunities for the Province to be more supportive of Open Data, though in different ways. Subject 1 believed there was a great need for standardization in data across municipalities, and that the Province (or even the Federal Government) ought to provide leadership for this. This would truly unleash the potential of Open Data for cross-comparisons of metrics. Similar comments were found in discussions with Subjects 2 and 3. Subject 3 suggested that this could be accomplished in collaboration with software developers whose products are commonly used by municipalities already. Subject 6 shared similar thoughts, specifying that universal frameworks would need to be made simple enough to facilitate easy adoption by municipalities. Subject 3’s comments also focused on the need for training and educational resources in order to empower municipalities to explore Open Data at their own pace. Subjects 6 and 7 expressed similar feelings, stating that providing toolkits, best practice examples, frameworks, and guides would be beneficial for local development. In terms of funding, Subject 6 stated that provincial funding would have a large impact on capacity for Open Data projects, while Subject 9 stated that funding for staff would be an issue more broadly, suggesting that funding would be helpful. Subject 4 was more skeptical, saying that additional funding would have to be substantial to consider any sort of Open Data work.

Having laid out the major results from the data collection for this research, it is now possible to discuss what can be learned from these findings. They can be considered in the context of research goals, policy implications, and broader discussions from the literature. All of these topics will be examined in the following chapter.
5 Discussion

The results in the preceding chapter can provide insight into the research questions set out in Chapter 1 of this report. Namely,

1. What factors drive the adoption of Open Data in rural Ontario? Are there expected benefits, and if so, what are they? Is there a felt need for investment in this technology in rural Ontario?

2. What factors impede the adoption of Open Data in rural Ontario? Are there major obstacles to this work, and if so, what are they? Are communities simply not interested in this technology?

3. Is the introduction of Open Data changing governance in rural Ontario? Can it lead to a greater sense of collaboration in a community, or is it largely a government-driven effort?

I will divide this wider analysis into 3 major sections: i) Measuring the need for Open Data, ii) Assessing implementation factors and the potential for change, and iii) Reflections on cultural impact and context. As with many rural discussions, this will at times require comparison between urban and rural areas, although this is not intended to suggest that these two are strict binary categories, nor that they are dualistically opposed in their characters, values, or interests.

5.1 Measuring the Need for Open Data

From the results, there is mixed evidence in terms of the need for Open Data in rural Ontario. Municipalities vary widely across the province, with differing levels of demand for Open Data and different capacities within municipal structures to implement it. Some communities – between one tenth and one twentieth based on survey results – comfortably choose to not pursue this work, and a large minority have not discussed the topic. However, there remain many communities which see utility in Open Data for a number of reasons. Unfortunately, many remain unable to develop their capacity due to structural obstacles. The most pressing of these are insufficient staff, a lack of financial resources, and a need for
technical training. This was reflected in interview results as well, with subjects citing the lack of staff to focus on this work and the need for training and education.

There was also a clear rural-urban divide in the presence of Open Data in communities. The municipal tier of a community had a clear effect on this, as upper-tier municipalities were more likely to have established data portals, but looking only at the different types of communities, suburban and urban municipalities were clearly more likely to have created a data portal than rural or remote ones. However, the lack of a resource does not necessarily imply a need for that resource. Among interview subjects, some spoke of the lack of need for Open Data in small communities, especially within lower-tier municipalities. Some felt that this was challenge more appropriately addressed by upper-tier municipalities.

It appears that some communities are unprepared for Open Data, with factors in data management that preclude the introduction of Open Data. Specifically, it is difficult to pursue this sort of work with a data system that is still stored in a physical form. Given that, according to this survey, rural communities are more likely to be in this situation, it is not surprising that rural communities have been less likely to develop Open Data systems than urban areas. Before conducting any deeper discussion of Open Data in these municipalities, one would have to reckon with this obstacle.

In the end, there appear to be three main divisions of municipalities across Ontario. First, there is a healthy group – in this study, 47 of 144 municipalities, or 32.64% – which are interested in Open Data and have the resources to pursue it. This is, of course, still a diverse group, with some communities having highly developed Open Data resources while others are troubled by insufficient staff, funding, or training. There are, undoubtedly, some municipalities which have taken steps to implement Open Data but which would be eager to develop these steps further.

Second, there is a smaller group which is not interested in the idea of Open Data and happily choose to not invest in it. In this work, 11 of 144 municipalities (7.64%) stated that they did not see Open Data as beneficial, and 32 municipalities (22.22%) had never discussed the
idea. This latter figure may well contain both those that would be interested in the concept of Open Data and others which are content without it.

Finally, there is a sizable portion of municipalities – in this research, 84 of 144, or 58.33% – which would like to develop an Open Data resource but which cannot do so. These communities expressed interest in developing Open Data initiatives for one or multiple reasons, although they had not established an Open Data portal at the time of this research. These three general groups demonstrate the great amount of diversity in Ontario’s municipalities on the subject of Open Data. In light of this, it is primarily the third group and any members of the first group seeking further assistance toward which policies and new initiatives ought to be directed, for it is among these groups that there is the most need and greatest potential for impact.

5.2 Assessing Implementation Factors and the Potential for Change

New policies and programs aiming to support municipalities in pursuing Open Data ought to be informed by proper assessments of on-the-ground situations. While this survey and these interviews have imperfections, they do provide insight into the experiences of everyday municipalities. For instance, a number of factors that affect the success of implementing an Open Data initiative arise in this research. From the success stories found in rural Open Data, common themes begin to emerge.

These areas have tended to have a degree of enthusiasm among their bodies of staff. This occurs in two ways: Firstly, there has to be a general perception of Open Data as a positive force for the community. The wider apparatus of the organization has to be generally supportive of this endeavour, even if only some members are actually involved in this work. Secondly, these initiatives often rely on a dedicated staff member leading the work. This person may be in a position dedicated to data management or Open Data more specifically, but they may also be in a more general or laterally-related role (such as GIS management) and simply have an affinity for Open Data. The difference between these two factors can be seen in Subjects 3 and 8’s municipalities. Both of these interviewees both saw value in developing Open Data in their respective communities, yet Subject 3 found support in co-workers and council, whereas the wider staff body in Subject 8’s municipality was not as interested in Open Data. Therefore,
Subject 3’s municipality has been able to successfully implement an Open Data portal and engage in wider discussions with nearby municipalities, while Subject 8’s has not done so.

Related to this, the need for a goal for a project was mentioned by one interviewee, but it appears to be a strong enough point to merit discussion. From a provincial standpoint, there is no point in investing in projects which are not desired by the public. Thus, while a municipality should not be discouraged from pursuing Open Data, even if purely out of interest, this dictum appears to applies well at the provincial level. As a guiding principle, supports for Open Data ought to be made available in non-invasive ways rather than being imposed, and that they be geared toward municipalities which are interested or which see potential in the concept. If areas are at peace with the current state of affairs, this should ultimately be recognized and respected.

A major component of implementation is clearly the software used by municipalities and their potential to facilitate a release of information. The use of GIS software in particular was mentioned as a key factor in creating Open Data portals, and multiple interviewees commented on the potential for the Province to work through software companies in supporting Open Data. This could in theory be achieved both with GIS applications and other software, such as that used for financial information. As well, this would be a simple way to develop a more universally-used framework that could smooth the way for comparisons between municipalities.

Interviews included discussions around removing hurdles for municipal staff, particularly in terms of privacy concerns. Although privacy issues were listed as a reason for not establishing an Open Data portal by 15.46% of municipalities asked, 50.00% of those which had established Open Data portals were hesitant to release additional information due to privacy concerns. Multiple interview subjects also related the challenge of understanding where the line lies between data for public consumption and data that must remain confidential. If possible, educating municipal staff on this issue could be very beneficial, and educational programs could be implemented through a joint effort from the Province and organizations that support Open Data, such as Open North, the Open Data Exchange, or the Municipal Information Systems Association.
Along these lines, interviewees also spoke of general education around Open Data as an area for improvement. Some expressed the desire for toolkits and frameworks, while others spoke favourably of conferences that they had attended, and still others expressed a need for better and more streamlined communication with the Province. One suggested the idea of an online forum where staff could learn more from other municipalities. These need not necessarily come from the Province, and could instead be handled by other groups if they were interested, such as the Association of Municipal Clerks and Treasurers of Ontario.

Finally, although it did not become the topic of this study, the need for broadband Internet provision across Ontario remains a concern and was mentioned in one interview as a large obstacle for data initiatives in a municipality. Looking beyond Open Data, this is a critical part of keeping Ontario’s communities liveable, innovative, and competitive in the 21st century. Investing in this infrastructure in rural Ontario would be a wise decision, both for developing data initiatives such as Open Data, and for general community development.

In summation, for those municipalities seeking help with Open Data, there are clear areas in which the Province can be more supportive. Understanding that budgets grow tighter with each passing year, one cannot expect all problems to be solved by the Province, yet the Province can be supportive in multiple ways. Greater education and resources (such as toolkits or conference support) for municipal staff would do much to help, both in terms of advancing ideas within municipalities and clarifying questions around implementation for practitioners. Standardization remains a key area for coordination, and the Province could discuss this further with municipalities and software developers to create an ideal framework for wider use. (It is understood from interviews that the Municipal Information Systems Association of Ontario has been developing a similar idea and maintaining close communication with MISA on this matter would be a wise decision.) When given limited resources, they should be directed to the areas of greatest concern and impact.
5.3 Reflections on Cultural Impact and Context

5.3.1 Open Data and the Open Society

Discussions of Open Data sometimes include discussions of an Open Society and ways in which Open Data relates to this idea (Fung & Weil, 2010). The term “Open Society” was introduced by Henri Bergson, who proposed it as a more humanistic, welcoming, and charitable society that places an acceptance of wider groups of people and suggested that this was a superior society to the alternative (Bergson, Audra, Brereton, & Carter, 1935). This was later discussed by, among others, Karl Popper, who cast the Closed Society as rooted in several philosophers, notably Plato. Popper saw the tendency toward historicism – the search for grand narratives – as leading to tribalism and unjust domination by different societal groups (Popper, 1963). In contrast, Popper saw rationality as the basis of the Open Society and shunned in principle any reliance on any thought which could not be empirically demonstrated, in contrast to Bergson who left space for less rational and more mystical thought (Hayes, 2008).

It may thus be asked, has Open Data left a mark on the general culture in making it a more open society? As this topic pushes this report into more theoretical spheres, it is difficult to comment succinctly and conclusively, but some thoughts emerge from what has been learned in this research project.

In general, there is a small amount of evidence to support this notion in a powerful way. Open Data, at least in rural Ontario, is largely a concern of the local government for its own operations and public relations. It is true that many Open Data portals were established with providing public access to data as an inspiration, and many of the surveyed communities cited this as a reason for interest in Open Data. However, interest for the sake of governmental efficiency or economic development could also be found. Reflecting on the perceived lack of impact of local government, one interview subject even commented that, “Most people really don’t care about local government...They go and elect people once every four years. Their expectation is that, you know, the municipality is run properly. If it’s not, they’ll vote for somebody else the next time.” If Open Data serves this purpose of maintaining good governance in the eyes of the electorate, then it becomes a political possibility, but it is often not given
priority for the sake of building a more just or open society. These ideals generally do not appear to figure into political discussions in rural Ontario.

In a contrary view, some have criticized Open Data for having neoliberal undertones or being co-opted by other interests despite good intentions (Bates, 2012; McClean, 2012), as mentioned in Chapter 2. However, while economic development was a driver of some Open Data initiatives, this occurs more on the part of government than on the part of the business sector. One interviewee related that development companies were a large beneficiary of Open Data, but this was not seen as taking away from government and was instead celebrated as a success. A strong business sector benefits the local community, and any move which governments can make to generate more business (such as providing road data for companies) with minimal cost is welcomed.

Reasons for the apparently small impact of Open Data in Ontario’s rural communities may be many, but one may be the lack of publicized use cases. This was noted by one of the interviewees:

A lot of the innovation has been driven by large urban areas, and again, especially in those early days of Open Data, you had really innovative and interesting use cases where people, like individuals, would take your data, as in, your government data, and do something that was kind of inspiring or useful with it that the government wasn’t able to achieve itself...how does this apply to a mostly rural geography? So you’re not at all sharing—or seeing the same use cases, I suppose.

In Canada’s urban areas, Open Data has become well-publicized due to innovative uses of government data that improved daily life for citizens (Coleman, Dumas, & Olejarz, 2017; Mertz, 2017). Application development, often spurred by government-run events, has led to uses which could be widely discussed and put forward as project results. In comparison, rural Open Data tends to be used by a smaller number of persons and organizations for more specific purposes. These uses have tended to be driven more by special interests or industrial uses rather than by improving knowledge or convenience for the general public. Due to its niche character, this work has not generated the same level of interest, and while it is certainly not the only factor, it could be argued that this has impeded the degree to which Open Data can be truly impactful on a wider, societal level. When unique and useful cases for Open Data arise in rural
areas, these ought to be discussed and publicized in order to spur thought in other municipalities around the possibilities of this technology.

5.3.2 New Regionalism

A current trend in rural development literature has potential connections to this work. The concept of New Regionalism has gained prominence in recent years, in some instances as a descriptive framework and at other times as a normative way forward for communities in rural areas. New Regionalism suggests that development is occurring (or ought to occur) at the level of the “region,” often encompassing multiple municipalities yet at a different (and often smaller) scale than current provinces or states. It also speculates that this development is becoming more collaborative, more open, and based more on trust; involves new partnerships with a larger group of local/regional organizations in a network manner; focuses on development rooted in a particular place or locale; and includes a recognition of rural-urban interdependence (Gibson, 2019).

Does this study provide examples of New Regionalism or a New Regionalist approach to development? Overall, though some results could be seen as New Regionalist in character, this cannot thoroughly be answered in the affirmative. The strongest example of this came from Interview Subject 2, who discussed a collaborative Open Data portal supported by two municipalities and several local social service agencies. This initiative was driven by the social service agencies and it was only later that municipalities became involved, more as a partner than in a leading or directing role. However, this example was a clear exception to the norm found in most municipalities.

In the majority of cases, Open Data was an initiative driven unilaterally by a level of government without involvement from other organizations or the wider public. While data is being released more openly and transparently in some areas, it is often done in a single direction from the government outwards and does not feature direct and integral involvement from others. It appears that Open Data is often most easily pursued by upper-tier governments, and these already span several lower-tier governments, meaning that they may function in similar ways to and be roughly coterminous with the more nebulous concept of a region. Many upper-tier
governments in Ontario include at least one major population centre and multiple surrounding towns, townships, and villages, and so implementation at the upper-tier often covers a combination of rural and urban areas, though these projects may not necessarily foster greater interdependence in a significant way. Thus, Open Data implemented by the upper tier may represent a step towards a New Regionalist approach to development, even though it may not fully qualify as such. These observations are largely in line with recent studies of New Regionalism which find evidence for some aspects of the phenomenon in various initiatives but do not conclude that it is occurring in Canada in its fullest sense (Vodden, Douglas, Markey, Minnes, & Reimer, 2019).
6 Limitations of Study and Areas of Future Research

As in any study, the practitioners may recognize flaws in their design and ways in which procedures could be improved. This is, undoubtedly, true of this project as well, and here I will outline some of the reflections on these issues while also describing new paths which this line of research may take in the future.

6.1 Study Limitations

Some of the shortcomings of this work are merely built in by design. All research requires bounds in order for it to ultimately reach a conclusion. Therefore, the restrictions of scope to a particular geography (Ontario), population (municipal staff members in a list of roles), and time period (a single survey and a single series of interviews at a given point in time) necessarily limit the ability for this work to be encompassing the phenomenon of Open Data. This work necessarily excludes, at least to a degree, the views of other potential informants, including but not limited to members of the private sector, intellectuals, interest groups, and the general public. It would have been especially beneficial to speak at length with representatives from organizations supporting Open Data in Canada, such as the Open Data Exchange or the Municipal Information Systems Association.

Additionally, limitations in the implementation of this work must be acknowledged. The survey distributed to municipalities may have been improved in design or in distribution. Some questions may have excluded views which respondents wished to express and could have been made more holistic in possible responses. A key area which the survey could have explored further was broadband Internet and its role in expanding data capacity in rural areas. As well, using an online platform could have restricted the ability for some to take part. It may have been the case that staff with salient experiences to share were unable to do so precisely because of those experiences – an office may be less able to share the difficulties of being understaffed by virtue of not having adequate time to participate. On a pragmatic note, it would have been wise to schedule reminder e-mails for survey recipients to encourage a higher rate of response. As well, this research happened to be conducted over the summer of a Provincial election, and some
respondents stated that the election gave them added responsibilities that restricted their ability to participate. This was difficult to foresee and little could be done to remedy this state of affairs.

Interviews held for this research introduced challenges as well. Carrying out interviews by phone allowed for a greater geographical diversity of participants, but in some moments this format impeded communication and understanding. In terms of implementation, interview questions sometimes diverged from each other, even among similar participants. Some questions were thought of in hindsight after an interview had concluded and could not be clarified further. However, these limitations can be nearly impossible to foresee and nearly as difficult to overcome.

6.2 Future Research Areas

Many of the limitations outlined above reveal ways in which this research might continue or expand. I will outline a few potential areas of further inquiry, although there are likely to be many more.

Firstly, a change in geography may bring further insight. A similar study could be conducted in other parts of Canada or elsewhere to examine whether this would yield similar results. In methodological practice, this work could be quite similar or could introduce new concepts, questions, or methods. Such a project would need to consider many factors, including but not necessarily limited to the political, economic, and policy-based differences between Ontario and another area of study.

As well, while this report has undertaken within the field of rural planning and development, its subject matter has focused more on rural development than rural planning, with respondents being more rooted in public administration than planning. It may be worthwhile to investigate the implications of Open Data for rural planning more specifically. This appears especially relevant given that some interview subjects suggested Open Data as a vehicle for public engagement and the development of planning documents (such as Official Plans). This could involve a similar methodology aimed at planning staff instead of the groups of municipal staff targeted in this work.
Additionally, the focus on Open Data could be relaxed to discuss municipal use of data more broadly. Instead of asking how or where Open Data could be implemented, it may be worth studying the more fundamental question of whether data factors into planning and administration in municipal governments. Conceptually, this would be similar to Reimer & Brett’s work on scientific knowledge and rural policy (2013), but could examine data collected by different levels of government rather than scientific or academic work.

A final option to consider is to focus on a more specific type of data. As an example, one could more closely examine road network data as it relates to development in rural areas. This work could approach the topic in terms of the construction sector, municipal planning departments, or both. This may even bridge beyond the topic of Open Data and could discuss the impact of Big Data or Civic Intelligence on these processes.
7 Conclusion

Through the scope of the 3 research questions set out in Chapter 1, I will offer a few concluding comments on Open Data in Ontario, specifically in its rural municipalities.

It becomes clear from examining the work already done that some rural areas have been able to develop Open Data initiatives through their own efforts, and these ought to be recognized and applauded. Some of these communities have demonstrated ingenuity and courage in exploring the concept in innovative ways for their community. These works are inspired by a number of factors, including both pragmatic concerns around economics or efficiency and idealistic beliefs in creating a fairer, more equitable government. Rural Open Data initiatives, generally speaking, have a different character in comparison to urban ones, and are currently used more by niche sectors such as development and special interest groups. This study also uncovered characteristics which have aided the creation of these resources, such as enthusiastic staff, software that allows portal construction at low cost to time and finances, discussion with other communities and organizations, and a goal-oriented approach.

There are, of course, other communities which have not pursued these ideas, and some of these have done so deliberately. If an area is not interested in Open Data, this autonomous choice must ultimately be respected. However, this research indicates that many rural communities and individuals are interested in Open Data but face substantial hurdles. These included uncertainty around what was allowed by current guidelines, a lack of cohesion among staff, and insufficient human and financial resources. To properly remedy these issues could spur greater developments in Open Data for municipalities and the public at large.

I have outlined areas where it appears the Province may be able to support rural Open Data, including the development of public resources supporting these communities and an increased leadership role in creating province-wide standards and guidelines for Open Data practices. The consistent provision of broadband Internet in rural area is also a concern which ought to be addressed, both for the sake of Open Data and for more general community development value. While one cannot expect all problems to be solved by higher levels of
government, it would be wise for the Province to consider policies that may reduce unnecessary challenges for communities interested in developing Open Data resources.

Finally, on a more theoretical level, I examined the research’s results in regard to both the wider idea of an Open Society and recent developments of New Regionalism. In the first case, there was limited evidence of Open Data having a large societal impact on the openness of the communities under study. Open Data did not make these areas more closed, but it was largely done from a pragmatic perspective to improve efficiency or improve the economic character of the area, often with the caveat that costs remained low. However, public access to data was cited in many cases as a benefit from these portals.

Regarding New Regionalism, most of the communities under study developed Open Data resources in a unilateral fashion. There was only one case where an Open Data portal was created as a collaborative effort between municipalities and other local organizations. In many cases, though, these projects were done at the upper tier of government, which often covered a combination of rural and urban areas. Therefore, this work appears to represent some steps in the direction of New Regionalism, but it does not provide conclusive evidence of it, similar to other recent analyses of New Regionalism.

Looking at the benefits and pitfalls of Open Data outlined in Chapter 2, some of these can be applied to rural Open Data, while others are more difficult to find. There continue to be communities which see Open Data as a support for economic development and for increasing governmental efficiency, and many municipalities are keen to increase citizen access to data. As well, support from the municipality’s central institution and other external groups can help in implementing Open Data, as found in other studies. However, in rural Ontario, Open Data appears to be more of a niche field, with datasets used more by industry than the general public. However, this does not appear to be a neoliberal hollowing out of the government; rather, it often seems to serve as an endeavour that is mutually beneficial, to a moderate degree, for both the community and local industry. At the same time, many municipalities remain reticent towards collaborative efforts with other groups, and they often raised privacy concerns around the topic of Open Data. Thus, while some themes from the literature are present, rural Open Data
does not conform totally to what has been established from studying the phenomenon in large urban centres.

Ultimately, Open Data in rural Ontario remains a burgeoning field and it is uncertain where it will go in the future. There is great potential for this work going forward, but it must be informed by proper study and well-planned moves to support the work of communities across Ontario. The Province would do well to consider ways of bolstering this effort in the coming years.
REFERENCES


APPENDIX A – RESEARCH ETHICS BOARD CERTIFICATE

The members of the University of Guelph Research Ethics Board have examined the protocol which describes the participation of the human participants in the above-named research project and considers the procedures, as described by the applicant, to conform to the University’s ethical standards and the Tri-Council Policy Statement, 2nd Edition.

The REB requires that researchers:
- Adhere to the protocol as last reviewed and approved by the REB.
- Receive approval from the REB for any modifications before they can be implemented.
- Report any change in the source of funding.
- Report unexpected events or incidental findings to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants, and the continuation of the protocol.
- Are responsible for ascertaining and complying with all applicable legal and regulatory requirements with respect to consent and the protection of privacy of participants in the jurisdiction of the research project.

The Principal Investigator must:
- Ensure that the ethical guidelines and approvals of facilities or institutions involved in the research are obtained and filed with the REB prior to the initiation of any research protocols.
- Submit an Annual Renewal to the REB upon completion of the project. If the research is a multi-year project, a status report must be submitted annually prior to the expiry date. Failure to submit an annual status report will lead to your study being suspended and potentially terminated.

The approval for this protocol terminates on the EXPIRY DATE, or the term of your appointment or employment at the University of Guelph whichever comes first.

Signature: 
Date: March 1, 2018

Stephen P. Lewis
Chair, Research Ethics Board-General
APPENDIX B – RESEARCH SURVEY

Surveying the Use of Data in Ontario Municipalities

Start of Block: Introduction

Q1.1 Surveying the Use of Data in Ontario Municipalities
This survey is part of a Master's-level research project through the University of Guelph and is designed to assess:
1) The ways in which data are being used in municipalities in Ontario and
2) The opportunities for and barriers to this data usage from the perspective of incorporated municipalities

You have been invited to voluntarily participate in this survey based on your current work in an incorporated municipality in Ontario. This survey is expected to require 10 minutes to complete. The results of the survey will be used solely for research purposes and will only be shared with members of the research team.

All identifying information will remain confidential and stored in a master list. No identifying information will be published, and identifying data will be destroyed upon completion of this research. Anonymized data will be retained after this research is completed. You do not waive any legal rights by consenting to participating in this survey. The researcher reserves the right to disregard results if circumstances merit such a decision.

This project has been reviewed by the Research Ethics Board for compliance with federal guidelines for research involving human participants. If you have any questions concerning your welfare and rights related to this research, please contact the Director of Research Ethics at the University of Guelph at reb@uoguelph.ca or 519-824-4120 x56606.

Questions or concerns about the research can be directed to:
Alexander Petric
M.Sc. Candidate
School of Environmental Design & Rural Development
University of Guelph
apetric@uoguelph.ca
226-343-2345

Dr. Ryan Gibson
Professor
School of Environmental Design & Rural Development
University of Guelph
gibsonr@uoguelph.ca
519-824-4120 x56785

Have you read the above information and do you consent to participate in this survey?

☐ Yes (1)

☐ No (2)

[Skip To: End of Survey if Q1.1 = No]

End of Block: Introduction

Start of Block: Data Formats

Q2.1 Please enter the name of your municipality:

___________________________________________________________

Q2.2 Which of the following best describes your position?

☐ Chief Administrative Officer (1)

☐ Clerk (2)

☐ Freedom of Information Officer (5)

☐ Information Technology Manager/Director (4)

☐ Librarian (6)

☐ Other (Please specify) (7)

___________________________________________________________
Q2.3 Which of the following categories best fits your municipality?

- Remote (1)
- Rural (2)
- Suburban (3)
- Urban (4)

Q2.4 Which of the following categories best fits your municipality?

- Lower-Tier (1)
- Single-Tier (2)
- Upper-Tier (3)

Q2.5 Some municipalities keep their municipal records in a digitized/computerized format, whereas others maintain physical copies of their records. Which of the following best describes your municipality?

- Our records are all or mostly stored digitally and not physically (1)
- Our records are all or mostly stored physically and not digitally (2)
- Our records are stored both physically and digitally (3)

Display This Question:
If Q2.5 != Our records are all or mostly stored physically and not digitally
Q2.6 In what year did your municipality begin storing records digitally?

- 2018 (1)
- 2017 (2)
- 2016 (3)
- 2015 (4)
- 2014 (5)
- 2013 (6)
- 2012 (7)
- 2011 (8)
- 2010 (9)
- 2009 (10)
- 2008 (11)
- 2007 (12)
- 2006 (13)
- 2005 (14)
- 2004 (15)
- 2003 (16)
- 2002 (17)
- 2001 (18)
- 2000 (19)
- Before 2000 (20)
Q2.7 Has your municipality begun to store new information in a digital format as the information is acquired?

- Yes (1)
- No (2)
- Unsure (3)

Q2.8 In 2017, did your municipality digitize any older physical records?

- Yes (1)
- No (2)
- Unsure (3)
Q2.9 To your knowledge, are any of the following factors preventing the adoption of digital formats for data in your municipality? Select all that apply.

☐ A desire to not change the current system (1)

☐ Lack of financial resources to address this issue (2)

☐ Lack of technical training among staff (3)

☐ Lack of time available to address this issue (4)

☐ Lack of staff available to address this issue (5)

☐ Other factors (please specify) (6)

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Start of Block: Data Portals

Q3.1 Does your municipality regularly allocate human resources to data collection and/or management?

☐ A staff member is assigned solely for data collection and/or management (1)

☐ A staff member manages data collection and/or management among other duties (2)

☐ No staff member is assigned to handle data collection and/or management (3)

☐ Unsure (4)

Q3.2 Some towns and cities have developed online data portals where users can access large amounts of statistical or geographic data about a municipality. These can cover topics such as the locations of institutions or services, the average income levels
across sections of a municipality, climate data for an area, reports related to municipal operations, and more. Does your municipality maintain a data portal on or as part of its website?

- Yes (1)
- No (2)
- Unsure (3)

*Skip To: Q3.18 If Q3.2 ! = Yes

Q3.3 To your knowledge, did any of the following motivations inspire the creation of this data portal? Select all that apply.

- A belief that this portal will drive local economic development (1)
- A belief that this portal allows residents access to data to which they have a right (2)
- A belief that this portal will improve efficiency within local government (3)
- A belief that this data will help brand a community as "forward-thinking" or "innovative" (4)
- Other motivations (Please specify) (5)
Q3.4 Which of the following types of information are made available on your municipality's data portal? Select all that apply.

☐ Agricultural/Farm data (1)
☐ Climate/Weather data (2)
☐ Demographic statistics (3)
☐ Economic/Business data (4)
☐ Environmental/conservation data (5)
☐ Historical data (6)
☐ Land use planning data (e.g., land use designations or zoning) (7)
☐ Municipal finance data (8)
☐ Municipal office data (e.g., locations, hours of operation, staff) (9)
☐ Recreational data (e.g., trail locations or permitted uses) (10)
☐ Tourism data (11)
☐ Transportation/Traffic data (12)
☐ Other data (Please specify) (13)
Q3.5 What is the primary source of the data that is available on your municipality's data portal?

☐ Federal government (e.g., Statistics Canada, Health Canada) (1)
☐ Provincial Government (2)
☐ Third-party for-profit corporations (3)
☐ Not-for-profit corporations (4)
☐ Data collected by your municipality (5)
☐ Other source (Please specify) (6)

Q3.6 Does your municipality track the number of visitors to its data portal?

☐ Yes (1)
☐ No (2)
☐ Unsure (3)

Q3.7 Are users required to register with your municipality's data portal in order to access data?

☐ Yes (1)
☐ No (2)
☐ Unsure (3)
Q3.8 Is access to your municipality's data portal and the use of the data available free of charge?

- Yes (1)
- No (2)
- Unsure (3)

Q3.9 Are users allowed to reuse data from your municipality's data portal for any purpose?

- Data can be reused for any purpose (1)
- Data can only be reused for specific purposes (e.g., not-for-profit purposes) (2)
- Data cannot be reused (3)
- Unsure (4)
- Other conditions (Please specify) (5)

Q3.10 Are users allowed to reuse data from your municipality's data portal without citing your portal as the data's source?

- Yes (1)
- No (2)
- Unsure (3)
Q3.11 In which file formats are the data on your municipality’s data portal accessible? Select all that apply.

☐ Comma-Separated Value Files (.csv) (1)
☐ Graphical Images (.gif, .jpg, .tiff) (2)
☐ HTML Webpages (.html) (3)
☐ JSON files (.json) (4)
☐ Microsoft Excel Spreadsheets (.xls, .xlsx) (5)
☐ PDF (.pdf) (6)
☐ Plain Text Files (.txt) (7)
☐ RDF (.rdf) (8)
☐ Word Document Files (.doc, .docx, .odt) (9)
☐ XML Files (.xml) (10)
☐ Other Formats (Please specify) (11)

☐ Unsure (12)
Q3.12 Which of the following best describes the response that your municipality’s data portal has received from residents of your municipality?

- Citizens are very pleased with the data portal (1)
- Citizens are generally pleased with the data portal (2)
- Citizens are neither pleased nor displeased with the data portal (3)
- Citizens are generally displeased with the data portal (4)
- Citizens are very displeased with the data portal (5)
- Unsure (6)

Q3.13 Which of the following best describes the response that your municipality’s data portal has received from the business community in your municipality?

- The business community is very pleased with the data portal (1)
- The business community is generally pleased with the data portal (2)
- The business community is neither pleased nor displeased with the data portal (3)
- The business community is generally displeased with the data portal (4)
- The business community is very displeased with the data portal (5)
- Unsure (6)
Q3.14 Which of the following best describes the response that your municipality's data portal has received from your municipal council?

- The municipal council is very pleased with the data portal (1)
- The municipal council is generally pleased with the data portal (2)
- The municipal council is neither pleased nor displeased with the data portal (3)
- The municipal council is generally displeased with the data portal (4)
- The municipal council is very displeased with the data portal (5)
- Unsure (6)
Q3.15 Is there additional data which your municipality would like to make available online? If so, what type of data is it? Select all that apply.

☐ Agricultural/Farm data (1)
☐ Climate/Weather data (2)
☐ Demographic statistics (3)
☐ Economic/Business data (4)
☐ Environmental/conservation data (5)
☐ Historical data (6)
☐ Land use planning data (e.g., land use designations or zoning) (7)
☐ Municipal finance data (8)
☐ Municipal office data (e.g., locations, hours of operation, staff) (9)
☐ Recreational data (e.g., trail locations or permitted uses) (10)
☐ Tourism data (11)
☐ Transportation/Traffic data (12)
☐ Other data (Please specify) (13)

☐ ☐ There is no data which we would like to make available (14)

.Skip To: End of Block if Q3.15 = There is no data which we would like to make available
Q3.16 What is the source of the motivation to make this information available? Select all that apply.

☐ Request(s) from the business community (1)
☐ Request(s) from the provincial or federal government (2)
☐ Request(s) from citizens (3)
☐ Municipal council or staff see this as beneficial (4)
☐ Other motivation (Please specify) (5)

☐ Unsure (6)

Q3.17 Are any of the following factors preventing this data from being made available? Select all that apply.

☐ Concerns about privacy risks associated with data (1)
☐ Insufficient staff to devote time to this issue (2)
☐ Lack of access to data (3)
☐ Lack of technical training/capacity among staff (4)
☐ Uncertainty surrounding ownership of data (5)
☐ Other factors (Please specify) (6)
Q3.18 Are any of the following factors preventing your municipality from creating an online data portal?

- [ ] Concerns about privacy risks associated with data (1)
- [ ] Insufficient staff to devote time to this issue (2)
- [ ] Lack of access to data (3)
- [ ] Lack of financial resources (4)
- [ ] Lack of technical training/capacity among staff (5)
- [ ] Uncertainty surrounding ownership of data (8)
- [x] A data portal does not appear to be a worthwhile investment (6)
- [x] My municipality has never discussed the idea of a data portal (7)
Q3.19 Would your municipality want to develop an Open Data portal for any of the following reasons?

☐ Driving local economic development (1)
☐ Improving efficiency of government (2)
☐ Increasing access to information for residents (3)
☐ Branding the community as "forward-thinking" or "innovative" (4)
☐ Other (Please specify) (5)

☐ An Open Data Portal does not appear to be beneficial to our municipality (6)

End of Block: Data Portals

Start of Block: Interview Inquiry

Q4.1 Would you be interested in participating in a follow-up interview to discuss the use of data in your municipality? If you select Yes, you will be asked to provide your name and a method of contact.

☐ Yes (1)
☐ No (2)

Skip To: End of Block If Q4.1 = No

Q4.2 Name

______________________________________________
Q4.3 E-mail address or telephone number

End of Block: Interview Inquiry

Start of Block: Block 4