

# MM2020 INITIATIVE

## Business Case and Validation of Deployment Options

### Phase 1: Business Case Development

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## Executive Summary

Mississippi Mills population is growing at a healthy rate and attracting a good number of young adults. Employment rates and income levels are high. Given its proximity to the ever-expanding number of technology companies and government offices in Ottawa's west end, Mississippi Mills is well-positioned to thrive and prosper in the future provided it takes strategic action to address communication technology deficiencies for rural residents and businesses and improves transportation and affordable housing options for seniors and young adults. Deploying reliable, affordable broadband services throughout rural Mississippi Mills is an essential component of this strategy.

The outstanding response rate to the 2018 MM2020 survey of rural resident's experiences with communication technologies indicated the seriousness of the issues. Detailed survey feedback regarding broadband services provided strong evidence that immediate action is needed to address the lack of reliable, affordable broadband services. Many of the comments indicated that business, employment, personal safety, property values, and overall quality of life are being negatively impacted by the poor state of available communication technologies.

Lack of broadband services in rural areas has been shown to lower property values, hinder business operations, and contribute to population decline. With adequate, affordable broadband, rural communities can take advantage of the latest developments in business management, flexible employment options, health care access, educational opportunities, public safety and other digital government services. While government policies appear to be headed in the right direction, timely practical funding mechanisms are urgently needed to address the urban/rural digital divide.

To address the urgency of this matter, MM2020 sought out a vendor willing to investigate a more aggressive rollout of broadband infrastructure and direct-to-residence optical fibre installation in the near term. As a result of MM2020's efforts, a regionally-based supplier has put forward an aggressive plan for the provision of rural broadband services to every rural household in Mississippi Mills, beginning with a "Clayton Pilot" of about 120 homes in the Clayton area in the spring of 2019. The feasibility of financially supporting a specific vendor's implementation plan that meets the needs of the timely deployment of broadband infrastructure to rural Mississippi Mills residents and businesses is under consideration.

The authors of this report considered the options regarding financial investment by the municipality and/or county in the deployment of rural broadband in Mississippi Mills and determined that most appealing and viable approach would be either a public-private partnership, public utility or co-operative. It concludes that the current single vendor proposal should be considered in the context of a public-private partnership model. While provincial legislation and local municipal procurement policies permit single-source procurement in some circumstances, due diligence is advised especially if funding is being sought from or through the municipality. These actions will determine the viability and legality of the single vendor option.

External funding sources to support the MM2020 project were also identified and reviewed for compliance and eligibility. A summary of Financial Support Options and Limitations can be found in the "Summary of Action Items" section of this report.

Time is of the essence in this matter. Urgent action is needed to address the urban/rural digital divide in Mississippi Mills.

# Table of Contents

- Executive Summary ..... 2
- Introduction ..... 4
- Project Overview ..... 5
  - Methodology and Approach..... 6
- Phase 1 A: Business Case for Broadband in Rural Mississippi Mills ..... 7
  - a) Demographic and Economic Context..... 7
  - b) MM2020 Clayton and Pakenham Survey Background..... 10
  - Clayton and Pakenham Survey Data Analysis and Implications..... 10
  - c) Economic Impact..... 12
    - Background..... 12
    - Economic Impact of Not Providing Accelerated Rural Broadband Delivery ..... 14
    - Economic Impact of Providing Accelerated Rural Broadband Delivery ..... 15
  - d) Optimum Broadband Services Needed..... 19
    - Broadband Defined: ..... 19
- Phase 1 B: Feasibility of Municipal Support for Single Vendor Offering ..... 21
  - Background..... 21
  - a) Feasibility of Single-Vendor Solution..... 21
  - b) Financial Support Options and Limitations ..... 25
- Moving Forward – What’s Next? ..... 29
  - State of Broadband in Rural Mississippi Mills ..... 29
  - Feasibility of a Single Vendor Partnership Model ..... 29
  - Building and Leveraging Influential Alliances..... 30
- Appendix A: MM2020 Clayton Pakenham Surveys and Data ..... 33
- Appendix B: Commuting to Work / Work from Home ..... 35
- Appendix C: Five Common Approaches to Need ..... 35
- Appendix D: Clayton and Pakenham Survey Questions & Responses ..... 36

## Introduction

There is no argument amongst governments, social planners and economists that access to broadband is an essential part of a country's overall economy and social development. World-wide, citizens rely on high-speed Internet to access basic services like healthcare and education as well as to improve social inclusion. While contributing to innovation by helping business processes become more efficient, broadband services in smaller rural communities can bring new entrepreneurs to a global audience, and enable rural citizens to access products and services from distant sources.

In 2010 the Eastern Ontario Warden's Caucus (EOWC) created the Eastern Ontario Regional Network Inc. (EORN) as a not-for-profit corporation to address the need for broadband access across rural eastern Ontario. Since its inception, EORN has mobilized private and public investment of more than \$175M to provide new or improved broadband access for nearly 90% of eastern Ontario rural households outside the city of Ottawa. The project included a 5,500 km fibre backbone across Eastern Ontario, with 160 Points of Presence, as well as last kilometre based on a variety of technologies including DSL, FTTP, and fixed wireless. A satellite component was included in some areas to ensure a measure of service was available to all residents. The project was completed in collaboration with EORN's 6-private commercial Internet Service Provider (ISP) partners, who own and operate the network.

However, the capacity and performance associated with the initial EORN project is being rapidly outstripped by the bandwidth consumption patterns of the public and demand for constantly increasing speeds and capacity continues to put pressure on the networks and its technologies. In Mississippi Mills, while broadband services are available in most of Almonte and in adjacent municipalities of Carleton Place and Arnprior, most of the rural areas have very limited broadband access. Indeed, Mississippi Mills remains one of the poorest served municipalities with rural access limited primarily to those with proximity to the more urban centres.

The 2019 priority for EORN will be improving cellular service while conducting a gap analysis of broadband coverage in Eastern Ontario. This development leaves rural Mississippi Mills without much hope of improving broadband access during the next five years and further emphasizes the need for a local push for broadband services.

MM2020, a community-based volunteer working group, was formed to:

- Assess and inform regarding rural Mississippi Mills broadband requirements
- Promote and facilitate accelerated broadband deployment for rural Mississippi Mills
- Target the year 2020 for rural delivery of broadband services

In a presentation to the Community and Economic Development Committee (CEDC) of Mississippi Mills on June 2, 2018, MM2020, a community-based volunteer working group, received support to move forward with a business case to accomplish the goal to provide Broadband Internet access to all rural areas of Mississippi Mills.

The MM2020 working group determined that a business case was needed:

- because the market has not naturally delivered Broadband infrastructure to MM;
- to document the requirement for broadband by analyzing the regional MM2020 survey data sets to quantify and characterize the need for rural broadband access;
- to identify financial and non-financial benefits;
- to outline approaches for accelerating commercial delivery of the infrastructure;
- to examine municipal involvement; alignment with overall municipal strategy, and other levels of governance as appropriate;
- to identify steps from Business Case acceptance through to Broadband service delivery

2018 was a year of information gathering and organizing to drive the case forward for rural broadband access. In 2019 the Clayton Pilot is poised for deployment as soon as the frost is out of the ground. The pilot will provide a basis upon which to build a relationship for the rollout of broadband service to all of Mississippi Mills.

The Business Case & Deployment Options project will:

- address a broadband access status quo that is inhibiting the economic growth and prosperity of MM's urban, rural and agricultural population;
- address a strong identified need to close the urban/rural divide in terms of broadband services;
- identify comparative and informative national and regional experience; and propose actions towards resolving the core issue of a broadband service access deficit.

MM2020 has its sights on the year 2020 and are optimistic that 2019 will see broadband planning for Mississippi Mills taken to the next level.

## **Project Overview**

### Phase 1

- a) Develop the Business Case for support of a plan to deliver broadband services to rural Mississippi Mills;
- b) Assess the feasibility under guidance of the Ontario Municipal Act for the financial support to a single vendor for the deployment of broadband services, and identify financial options and any limitations associated with such support;

### Phase 2

- a) Assuming feasibility as assessed under Phase 1a) above (with sign off by MM2020) evaluate/validate a vendor solution costing model with a minimum expectation of meeting the December 2016 CRTC guidelines of 50/10 for 90% of the currently unserved residents by December 2020; or
- b) Assuming lack of feasibility as assessed under Phase 1b) above, prepare the set of Mandatory Requirements for an MM2020 Broadband Services RFP for multiple vendor competition.

## Methodology and Approach

The contract for this project was awarded to Robert Leitch, Sonoptic Media and Communication, in association with Nelson Rogers, Community Ingenuity. Robert Leitch, M.Ed. provided management and coordination, including logistics, scheduling meetings, invoices, documentation and communications to client. Nelson Rogers, Ed.D. conducted research, business and technical analysis. Collaboratively, they analyzed the data provided by MM2020, assessed information retrieved through communication with relevant organizations and individuals, and identified local relevance of public documentation of government policies and programs.

Over the course of this engagement, the consultants have:

- Held consultation meetings with MM2020 committee members and others.
- Requested and received documentation from relevant parties, including MM2020, the Municipality of Mississippi Mills, and the Eastern Ontario Regional Network.
- Conducted research through reviews of available documentation on government policies and programs (municipal, provincial, federal) relating to rural broadband.
- Reviewed relevant documents from Eastern Ontario Regional Network; Innovation, Science and Economic Development Canada; the Eastern Ontario Warden's Caucus; Ontario East Economic Development Commission; Rural Ontario Municipalities Association, Rural Ontario Institute; and others.
- Analysed key publications of recent academic research, as well as policy and program reviews conducted by other relevant organizations on rural broadband.
- Reviewed Municipal Act Ontario and Mississippi Mills and Lanark County Procurement Policies regarding single sourcing.
- Reviewed Mississippi Mills Official Plan regarding broadband issues.
- Reviewed Lanark County Economic Development Strategic Plan 2018-2020 regarding Broadband Infrastructure.
- Reviewed Mississippi Mills Strategic Plan update 2011 regarding broadband issues.

**About the Authors:** Robert Leitch and Nelson Rogers have been professional collaborators since 1996 when they worked together on the Lanark Communications Network (LCN) project, Canada's first community-based non-profit public/private coalition dedicated to the advancement of rural broadband network development and applications. At the time, Nelson was the Dean of Algonquin College Perth campus and Robert was LCN Executive Director, a secondment from the Lanark County Board of Education. In 2016, Nelson and Robert co-author the County of Frontenac In-Field Emergency Broadband Communications Study and Analysis. Nelson and Robert have managed many multi partner projects in both the public and private sectors and maintain executive level contacts and relations within the Eastern Ontario Regional Network (EORN); Ontario East Economic Development Commission (OEEDC); Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA); Science, Technology and Innovation Council Secretariat; Innovation, Science and Economic Development Canada (ISED), and other relevant agencies.

## **Phase 1 A: Business Case for Broadband in Rural Mississippi Mills**

### **a) Demographic and Economic Context**

The municipality of Mississippi Mills benefits from proximity to Ottawa and has a well-established diverse local economy. This amalgamated community of about 13,000 consists of the former municipalities of Almonte, Pakenham, and Ramsay Township. Between 2011 and 2016 it grew more than 6%, compared with growth rates of Lanark County and Ontario of about 4.6% in the same period. According to the 2016 Census, about 5,000 people live in the Almonte district, which means that about 60% of the population of Mississippi Mills is in the rural and village areas. With recent expansions of technology companies and relocation of government offices to the west end of Ottawa, Mississippi Mills is well-positioned to thrive and prosper, if communication technology deficiencies can be addressed, particularly access to affordable, reliable broadband services.

The Demographic Conundrum: Despite the healthy growth rate, the population of Mississippi Mills is skewed somewhat toward the senior end of the scale, with a median age of 48 compared with the provincial median of 41. A particularly significant age group - young adults aged 25 to 44 - now composes only 21% of Mississippi Mills compared to the provincial average, which is considered low at 27%. This low proportion of young adults is cause for concern. There has been considerable public policy discussion that Ontario's aging population is going to result in slowing economic growth, a shrinking labour force, and increased requirements for expenditures on health care and social services. Should these trends continue, they will have a significant impact on rural and small-town communities like Mississippi Mills. However, currently Mississippi Mills, especially the rural portion, is relatively prosperous mainly due to the high percentage of "Baby Boomers" (age 55 to 73 in 2019) who have, or recently had, good jobs in the Ottawa area. The median income of families with two or more persons was \$100K in 2015, compared with \$89K in the Almonte portion, \$87K across Lanark County, and \$91K in Ontario (Statistics Canada – 2016 Census Profiles).

The MM2020 project is focused particularly on the rural areas of Mississippi Mills. About 40% of the population of Mississippi Mills lives in Almonte, while 60% of the residents are spread across the rural areas and villages of the municipality. The rural areas are facing particular demographic challenges, but also have some promising features. For example, the 2016 Census reported that the Clayton area (K0A1P0 – Statistics Canada Dissemination Area 35090115) has a high percentage of residents over age 65 (almost 20%), a high median age (over 49), but a very small percentage of elderly (over age 85=less than 1%), and small average household size (2.5). However, the median income of two or more-person households is quite healthy at nearly \$108K, and poverty rates are very low (based on the Low-income cut-off, after tax: LICO-AT), much lower than Lanark County or Ontario averages. This area also has a strong labour force participation rate, and the most common occupation groups are (in order): business,

finance and administration; trades, transport and equipment operators; and sales and service. A close examination of community profile data for the Clayton East – Blakeney Dissemination Area 3590105) reveals very similar characteristics. **See Appendix A** for more detailed demographic information.

Although the average age of rural residents trends toward the mature end of the scale, employment rates and average incomes are significantly higher than many surrounding areas. These residents are particularly interested in preserving and enhancing their quality of life, and improving the efficiency of their businesses or employment, but problems with communication technologies, especially broadband, are barriers to these goals.

In examining data regarding commuting to work or working from home, the majority of the labour force of Mississippi Mills (64%) resides in the predominantly rural areas outside of Almonte. Of the approximately 4,500 people in the rural workforce, over 3,000 regularly commute to work. About two thirds of the rural commuters go to a work destination outside of Lanark County, primarily to Ottawa but also to Renfrew and Leeds and Grenville counties and other areas. Only about 500 (11.4%) of the rural Mississippi Mills workforce primarily works from home. However, it would appear from this data and the MM2020 survey comments that a much higher proportion of the rural labour force should be able to work from home if adequate broadband services were available. **See Appendix B** Commuting to Work / Work from Home for more detailed information.

For years, Lanark County has benefitted from many Boomer-driven trends: stable careers, family formation and growth, home ownership, investments in cottages and rural recreation, and so on. In recent years population growth in Lanark County has been largely driven by in-migration of retirees and soon-to-be-retirees, mainly from Ottawa. When the leading edge of the Baby Boom turns 75 and the peak of the Baby Boom hits 65 in 2021, these trends are going to change dramatically. As a much smaller cohort than the Boomers, “Generation X” (currently about 38 to 53 years old), have experienced a greater variation in careers and family formation, and have more challenges with debt-to-income ratios. They will be unable to maintain the Boomer-driven trends through the 2020s and beyond. For rural areas in most of Lanark County, this is likely to result in problematic declines in population and property values, particularly recreational properties. Related consequences are likely to include reduced rural services such as businesses and schools, increased costs of health and social services for the elderly population, and declining property tax revenue for municipalities. In addition, there is substantial change happening in what used to be core industries of rural areas – agriculture, forestry, and mining. The increased use of technology, and associated reduced employment in these sectors, are also going to contribute to the decline of the rural population.

Growth of the young adult population (age 25 to 44) is a key factor in the wellbeing and prosperity of a community. In Lanark County the apparent stability of the numbers in this category, at about 22% of the population, does not reveal the full picture. During the 2011 to 2016 period an average of about 900 people in this age group moved into the county each year but about the same number moved out – an annual turnover (in +

out) average of 13%. In an analysis of 27 non-metro census divisions in Ontario only 5 had a greater turnover rate.<sup>1</sup>

While Lanark County seems to have no difficulty attracting young adults, it is having great difficulty keeping them. This turnover is partially due to broader social trends. The Millennial generation (currently about 22 to 37 years old) will soon replace the Boomers as the largest generational cohort. Millennials tend to have non-linear life pathways: episodes of various kinds of education and employment, transitions through different types of relationships and household formation, and rapidly changing recreational and entertainment interests. The millennial age cohort is so diverse and variable in so many aspects that generational analytics may no longer be relevant – many analysts are using other approaches such as “Tribal Analytics”. Millennials are more likely to define “people like me” in terms of values and lifestyle rather than age. These factors present a number of challenges for communities that need to attract and retain young adults.<sup>2 3</sup>

Municipalities outside of major urban centres need to take strategic action on a number of fronts in order to maintain the growth of their population and economy, or at least prevent serious decline. Building community attractiveness and wellbeing depends on significant developments in various types of affordable housing, transportation options (public transit, active transportation, technology-mediated transportation services), diverse recreation and entertainment opportunities, as well as what are considered essential services in health care, commercial services, and communication technologies. It is in this context that the Eastern Ontario Regional Network (EORN) is working on improvements to mobile communication infrastructure, and the MM2020 group is analyzing the need for broadband across rural Mississippi Mills.

#### Highlights: Demographic and Economic Context

Mississippi Mills population is growing at a healthy rate and attracting a good number of young adults. Employment rates and income levels are high. Given its proximity to the ever-expanding number of technology companies and the relocation of government offices in Ottawa’s west end, it is well-positioned to thrive and prosper in the future provided it takes strategic action to address communication technology deficiencies for rural residents and businesses and improves transportation and affordable housing options for seniors and young adults.

Conclusion: Mississippi Mills needs to take strategic action to avoid declines in population and business activity. Deploying reliable, affordable broadband services throughout rural Mississippi Mills is an essential component of this strategy.

<sup>1</sup> Rural Ontario Institute. *Migrants 25 to 44 years of age*. Focus on Rural Ontario. Vol. 6, No. 3, 2018.

<sup>2</sup> <https://www.washingtonexaminer.com/john-zogby-unveils-tribal-analytics-to-understand-america>

<sup>3</sup> <http://mentalfloss.com/article/533632/new-guidelines-redefine-birth-years-millennials-gen-x-and-post-millennials>

## b) MM2020 Clayton and Pakenham Survey Background

*“Spurred on by EORN’s partner-based strategy for fostering local innovation in addressing the high-speed internet connectivity deficit, MM2020 set about surveying the rural Mississippi Mills populations of Clayton, Pakenham and Blakeney hamlets and the surrounding rural areas extending to the eastern, western and northern borders of the municipality. Those surveys are complete and the MM2020 believes the result is a statistically sound basis for establishing both the need for accelerated broadband delivery as well as extrapolating the economic value of same.”*

MM2020 RFQ

### Clayton and Pakenham Survey Data Analysis and Implications

While there is not a single best method for determining community need, if there are strong indications of the same type of need based on multiple approaches, there can be strong confidence that the need is serious enough to merit attention. In the current case, it was the spontaneous concerns of residents about communication services that led to the formation of the MM2020 Working Group. In addition, surveys were conducted to verify the extent and seriousness of the public perception of the need for improved communication services. In other parts of this report, reference is made to the comparison of rural and urban broadband services, and some methods of assessing adequacy of these services. Most major government departments and non-government agencies involved in communication technology agree that a high level of available, affordable broadband and mobile access is necessary for community prosperity and well-being. With each of these approaches to understanding need, there is evidence that improved broadband service is a significant need which requires immediate action in rural Mississippi Mills.

The project consultants have previously identified, adapted and tested a methodology for determining community need, through their Big Data for Small Places (BD4SP) program. This methodology is largely based on an approach used in the United Kingdom for ascertaining the seriousness and extent of community need including areas such as public health and community wellbeing. It provides an analytic framework for understanding the significance of expressions of need such as those revealed through surveys. For more information about approaches to determining community need, see the chart in **Appendix C: Five Common Approaches to Need or the Big Data for Small Place Workbook**.<sup>4</sup>

In 2018, The MM2020 group engaged in campaigns to elicit survey responses regarding telephone, mobile, and internet services in the Clayton and Pakenham areas.

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<sup>4</sup> BD4SP Workbook

<http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Big%20Data%20for%20Small%20Places%20Workbook.pdf>

Ultimately, 791 responses were received, of which about 350 responses were identified as being from Pakenham and area, and about 440 from Clayton and area. This is a remarkably high response rate considering that there are about 1,000 households in the survey area and a 10% response rate would be considered high for this type of research. In addition, many respondents provided detailed comments with deep insights. For more detailed information see **Appendix D: Clayton and Pakenham Survey Questions & Responses**.

When it came to internet services, about 10% indicated they had no internet access at home or declined to answer. Of those who reported a service provider, Storm was the most popular (35%), followed by Xplornet (26%) and Bell (20%), with about 10% reporting a wide variety of types of services from TekSavvy, FreeNet, AOL, Go Zoom, etc. Several respondents indicated that their main internet service came through their mobile phone plan, often to a tablet or similar device. There were over 400 comments about internet services, and by far the majority were negative. Those who were generally satisfied with services included 46% of those who identified as Storm customers, 16% of Bell customers, and 15% of Xplornet customers. Concerns were mostly about quality of the signal and lack of bandwidth, although complaints about customer service and the high cost of available services were very common. When asked if they would be willing to sign a contract for fibre broadband service if it became available, 88% of survey respondents agreed.

Typical comments about Internet services included:

- If we had known there was no good internet service available at this house when we bought it, we would not have bought this one.
- It is adequate, and their technical service is good. The price is not competitive, but we really don't have any other options.
- Service is generally reliable, but bandwidth and latency limit usefulness. Unable to reliably stream video, videoconference, or use VoIP.
- It is so slow I can't do my work from home - I drive into town and use my cell phone as a hotspot to send e-mails.

Regarding telecommuting and working from home, nearly 40% of respondents reported telecommuting at least some of the time, and about 30% reported having a home-based business. Based on the comments provided, the most common type of home-based business was related to information technology or consulting services. There was also a significant group who reported home-based trades and crafts businesses. A few people reported farm or agriculture-related businesses or other home-based sales. Some commented that they would work from home more often or expand their business if they had better access to communication technology. About one third of respondents reported buying or selling goods online, although it was unclear from the comments whether this was primarily for personal use or related to a home-based business.

There were about 200 comments regarding home phone service, about half of which referred to problems with their landline such as static, service outages, and poor customer service. However, a large proportion of the comments related to alternative

home phone services such as VOIP or cellular. These comments and concerns regarding quality of phone and cell reception indicate the need for new generation broadband with VOIP and 4G/LTE cell services as alternative service options.

#### Highlights: MM2020 Survey Analysis

The outstanding response rate to the MM2020 survey of rural resident's experiences with communication technologies indicates the seriousness of the issues. Many of the comments indicated that business, employment, personal safety, property values, and overall quality of life are being negatively impacted by the poor state of available communication technologies.

Conclusion: Detailed survey feedback regarding broadband services provided strong evidence that immediate action is needed to address the lack of reliable, affordable broadband services.

### **c) Economic Impact**

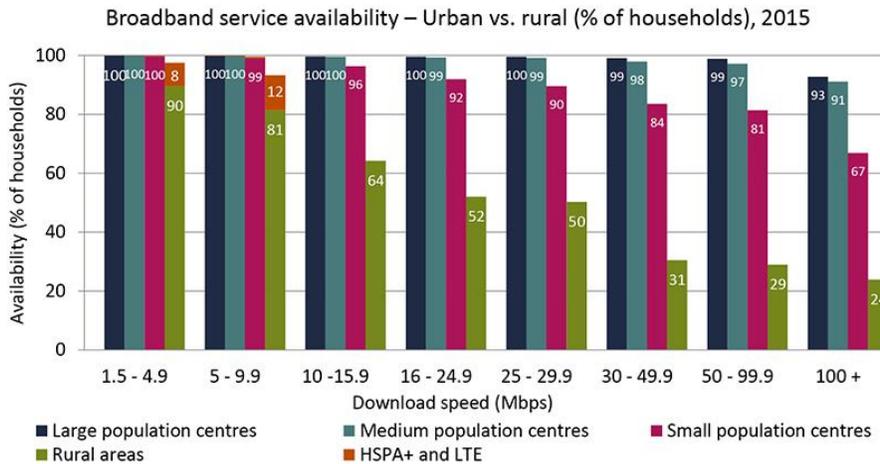
#### **Background**

Over the past twenty-five years, much has been written about the benefits of broadband and mobile services and their increasing importance in everyday life. However, to realize the benefits of digital technologies and online economic and social services, ubiquitous, uniform and future-proof broadband connectivity is required. An ever-increasing number of online services can be found in every sector: healthcare, public safety, education and training, libraries, government services and governance, agriculture, business, consumer services, economic development, banking, entertainment and culture, and more.

Despite widespread adoption of digital services in well-served urban centres and the general acceptance of the CRTC's 'Universal Service Objective', there remains a serious inequality of access that is hampering data-driven decision making in underserved areas.<sup>5</sup> There has been plenty of discussion and political posturing regarding the critical need for rural broadband, but not nearly enough financial commitment to meet the CRTC's Telecom Regulatory Policy (CRTC 2016-496) that states: "broadband internet access services are vital to Canada's economic, social, democratic, and cultural fabric".

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<sup>5</sup> CRTC Universal Service Objective <https://crtc.gc.ca/eng/internet/internet.htm>



(Sources: Innovation, Science and Economic Development Canada and CRTC data collection)

Note: This table of average national broadband service, although it shows that rural service is significantly less than urban, does not reflect the reality of rural areas like Mississippi Mills where broadband service level averages are much less robust and fall far short of the CRTC’s Universal Service Objective.

A Rural Ontario Institute (ROI) Guest Blog (Nov 21, 2018) summarizes these key issues: the federal government’s inaction on establishing a National Broadband Strategy, the mishandling of the ‘Connect to Innovate’ broadband expansion funding program, and its approach to auctioning high quality spectrum to support deployment in rural and remote areas that effectively eliminated small Internet providers from participating.<sup>6</sup>

Furthermore, the Auditor General of Canada’s 2018 Fall Report Conclusion 1.82 states: We concluded that Innovation, Science and Economic Development Canada and the Canadian Radio-television and Telecommunications Commission, according to their respective roles and responsibilities, monitored the state of connectivity but did not share enough detailed information publicly. We also concluded that Innovation, Science and Economic Development Canada did not develop and implement a national strategy to improve broadband Internet connectivity to a specific service level in rural and remote areas.<sup>7</sup>

Delays in establishing a National Broadband Strategy together with the mishandling of broadband expansion funding has had a direct impact on Mississippi Mills and other communities across Canada, most prominently in terms of timing.

Conclusion: Practical funding mechanisms are needed to address the urban/rural divide, as well as the scale and impact of the demographic indicators and trends. Since Federal and Provincial entities have not addressed this need in a timely fashion, immediate municipal and regional action is required.

<sup>6</sup> <http://www.ruralontarioinstitute.ca/blog/guest-blog--not-enough-funding---no-strategy-for-rural-broadband>

<sup>7</sup> [http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201811\\_01\\_e\\_43199.html](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201811_01_e_43199.html)

## Economic Impact of Not Providing Accelerated Rural Broadband Delivery

The prospect of declining rural populations due to the migration of ‘Baby Boomers’ seeking proximity to health and other services available in urban centres, and the churn in the ‘young adult’ populations may destabilize property values and reduce property tax revenue. Unchecked, these trends may result in slowing economic growth, a shrinking labour force, and increased requirements for expenditures on health care and social services. Broadband services are a critical component of rural sustainability and economic growth. Without affordable access to adequate broadband services most of the Internet of Things and other digital services will be limited or impossible.

Currently, house values and time-to-sale are being impacted by the availability of broadband services. In 2015, the Fibre to the Home (FTTH) Council Americas published a white paper *Study Shows Home Values Up 3.1% with Access to Fiber* indicating that high quality broadband in a neighbourhood could boost the value of a property.<sup>8</sup> The same study also revealed that sale prices for homes with 1 Gbps broadband tended to be around 7% higher than those with access to slower speeds such as 25 Mbps. Clearly, without higher the quality of broadband service a house is worth less.

An article in Canadian Property Management magazine in July 2016, *Fibre-optic internet shifts real estate industry*, talks about how businesses looking for commercial rental properties are increasingly considering fibre internet access to be an essential service.<sup>9</sup> Many companies will no longer consider opening or renting commercial space where fibre connectivity is unavailable. Areas without this level of communication technology are experiencing declines in business activity and employment.

Demographic trends will impact rural economic stability if not addressed. However, the effect can be mitigated or reversed by instilling a culture of innovation and change that promote community attractiveness and wellbeing. High quality affordable state-of-the-art broadband connectivity is a critical component that will help enable rural growth and prosperity through access to digital technologies. It is essential to economic and social development and quality of life.

Rural broadband is increasingly seen as vital to Canada’s economic, social, democratic, and cultural fabric, and all Canadians need to have access to broadband and voice communication services in order to participate in essential economic, educational, health, public safety and related services. See, for example, the 2018 Fall Reports of the Auditor General of Canada to the Parliament of Canada - Report 1: Connectivity in Rural and Remote Areas. This report gave a very critical overview of the importance of rural broadband, and the ineffectiveness of government policies and programs to address this issue.<sup>10</sup>

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<sup>8</sup> FTTH Study <https://www.fiberbroadband.org/blog/study-shows-home-values-up-3.1-with-access-to-fiber>

<sup>9</sup> Fibre-optic internet shifts real estate industry <https://www.reminetwork.com/articles/fibre-optic-internet-shifts-real-estate-industry/>

<sup>10</sup> [http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201811\\_01\\_e\\_43199.html](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201811_01_e_43199.html)

## Economic Impact of Providing Accelerated Rural Broadband Delivery

In addition to accessing information and entertainment such as video streaming and gaming, many other broadband services and innovations are becoming significant components of daily business and personal life. Often referred to as the 'Internet of Things' (IoT), they are the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data. Devices for the home such as thermostats, alarm systems, remote cameras, voice activated appliances, etc. are readily available. Some predictions are that the IoT market will increase by 30% per year for the next several years.<sup>11</sup>

Many sectors are increasingly reliant on technologies that require advanced broadband:

- **Data Collection and Management:** Many rural operations including dairy farms, field crops, herd management, maple syrup production, quarry operations, and more, are reliant on sensors that gather and transmit data which is essential to effective management, and business efficiency and profitability.
- **Business:** Many businesses are becoming increasingly reliant on Internet connected devices to market their products and services, monitor production, inventory, and transactions. Others rely on broadband connectivity to telework from their home office or a local teleworking centre.
- **Telework:** The online global nature of interacting knowledge workers and associated devices and technologies such as video conferencing, interactive multi-point chat meetings, and webinars enable a completely distributed workforce and allows that workforce to opt for a rural life-style. See, for example, the recent article in the New York Times: *Spread the Digital Wealth*.<sup>12</sup> There are many ways to create high-tech jobs in rural communities.
- **Healthcare:** Technologies to enable rural and remote access to medical and mental health services, including diagnostics and treatment, are being implemented in many areas where suitable broadband services are available. The ability to monitor and deliver and increasing number of health services remotely will allow people to remain in-place longer. Some examples include: tele-triage, remote diagnostic, and patient tracking - bringing service to the people rather than people to the service.
- **Education:** Access to online education, research and training have evolved with the availability of sophisticated learning management systems, administration and monitoring. Addressing the increasing issues of precarious employment and demand for continuous learning and retraining are driving the need for quality online access.
- **Public Safety:** Current proposals for a Canadian Public Safety Broadband Network (PSBN) revolve around secure high-speed wireless data communications networks to be used by emergency responders and public safety personnel as well as to inform the public of any impending risks.<sup>13</sup> However, fixed (fibre or cable) communication systems for public safety will continue to be important. For example,

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<sup>11</sup> Six IoT predictions <https://www.networkworld.com/article/3330738/internet-of-things/six-iot-predictions-for-2019.html>

<sup>12</sup> Spread the Digital Wealth <https://www.nytimes.com/2018/12/30/opinion/tech-rural-america.html>

<sup>13</sup> PSBN <https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/psbn-en.aspx>

many municipalities have water level monitoring systems which are used to predict flood levels and trigger flood warnings.

- **Government:** National, provincial and municipal governments are rapidly increasing their community outreach through digital services such as online transactions, website communications and social media to inform their public. EORN's eGovernment Toolkit is a highly useful resource for municipalities implementing digital services.<sup>14</sup>
- **Autonomous and semi-autonomous vehicles and other machines:** This technology is not just for the "car of the future" but is currently in use in agricultural machinery such as crop sprayers and vegetable harvesters and well as automatic vehicle location tracking systems for fleet management.

In 2017 the Rural Ontario Institute (ROI), with support from the Ontario Ministry of Municipal Affairs, commissioned a series of Foresight Papers on critical issues for the future of rural Ontario. Included in this series was *Broadband Infrastructure for the Future: Connecting Rural Ontario to the Digital Economy* by Dr. Catherine Middleton in which she states:

High-quality broadband connectivity is essential for all, but the consequences of not having good broadband are more serious outside urban areas. Among the specific benefits better broadband provides to rural areas are: online access to health and education services that are not currently available in rural communities, and the capacity to buy physical goods and obtain services that are not available locally. The deployment of broadband in rural communities promotes employment and wage growth and makes advanced manufacturing and high-end video production and editing possible. Broadband enables the establishment of local healthcare and advanced education facilities and supports law-enforcement agencies. The availability of good-quality broadband in rural communities will assist in attracting and retaining younger residents and will support the development of social enterprises by facilitating information sharing and community building. Rural business succession will not happen without the availability of broadband infrastructure to allow these businesses to join and thrive in the digital economy. (pg. 5 – 6)<sup>15</sup>

To provide insight into local examples of the critical importance of broadband services for the operation and growth of businesses in Mississippi Mills, the MM2020 team collected and summarized these Business Case Studies that demonstrate the impact of poor Internet service on large commercial operations in rural Mississippi Mills:

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<sup>14</sup> EORN eGovernment Toolkit [https://www.eorn.ca/en/resources/e-Government-Toolkit/EORN\\_eGovernmentToolKit2017\\_3.pdf](https://www.eorn.ca/en/resources/e-Government-Toolkit/EORN_eGovernmentToolKit2017_3.pdf)

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[http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Rural%20Ontario%20Foresight%20Papers%20017\\_Broadband%20Infrastrucure%20and%20Northern%20Perspective.pdf](http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Rural%20Ontario%20Foresight%20Papers%20017_Broadband%20Infrastrucure%20and%20Northern%20Perspective.pdf)

## **Dairy Farm Operation**

Brad Lowry and his family own and operate a large dairy farm on County Road 29 east of Almonte. In 2015 a new barn with a robotic milking system was built at a cost well in excess of \$1M. Their slow Internet signal and frequent disruptions make it difficult to monitor the robotics system and also create a challenge for the family to monitor animal health and milk production. Internet service to the farm has 'crashed' twice in the past couple of years and fixing it took a lot longer than it should have. The family has never had to dump milk, but it could happen in an extreme outage.

## **Fulton's Pancake House & Sugar Bush Operation**

Fulton's employs one full-time and five part-time employees year-round and approximately fifty seasonal employees from February through April each year. They've been in business as a Lanark County destination for over 50 years having a significant financial impact on the local economy of Almonte, Pakenham, and Carleton Place.

On a busy spring day, Fulton's can serve upwards of 1,000 meals in their Pancake House and have about 500 visits to their Maple Gift Shoppe. Fulton's depends on Internet connection to run their Point of Sale system (POS), including debit and credit card machines. This computerized POS system is required as their business has grown, and government regulations have increased. Due to their rural location, they've chosen to purchase and maintain an ATM machine onsite which depends on Internet to communicate with the customers' bank to provide funds. When they lost Internet service or it's been weak, they have to essentially shut down operations for a period of time until it is resolved. This work stoppage results in lost sales and very unhappy customers as well as added stress to their team.

As an added sales stream and to keep up with businesses in the 21st century, Fulton's has added an online presence in the form of a website and online store. In order to be able to serve their domestic and international clients they rely on our Internet connection to keep their online store updated and relevant. This too becomes an insurmountable task when they are without reliable, strong Internet service. In a letter to MM2020, 4th Generation Owner Shirley Fulton-Deugo states:

As Canadians rely more and more on digital forms of payment ... we are even more dependent on the Internet to function and serve our clientele. Almost exclusively we receive business inquiries via email and through our website contact form. For this reason, we have become dependent on high quality Internet service. As a business in 2019 we are unable to function without it and we should not be penalized and have to accept a lesser level of service because we are in a rural area.

## **Garden Centre Operation**

Whitehouse Perennials Ltd, located on Rae Road between Almonte and Carleton Place, is a seasonal retail business with 8 employees offering plants for sale. Cutting edge technology is used at the nursery to provide information to customers about the plants

they are interested in. Customers scan a QR code on a bench card with their smart phone which takes them to the Whitehouse Perennials app. The app contains information about the plant as well as suggestions for plant combinations or recipes. Staff also use the app to do garden design. Their business is really hampered by the slowness of their current internet connection.

### **Brewery Operation**

Cartwright Springs Brewery operates a very popular brewery in a remote location near Pakenham. They are only 15 meters from the artesian springs which is the key ingredient to their refreshing brews. The location is remote and it's impossible to get reliable internet service. This makes payment processing challenging. Neither do they have the bandwidth available to offer Wi-Fi to their guests. This makes it difficult for the patrons to rate beers online and do instant reviews, a big deal these days. Poor internet also makes monitoring the security system impossible. The biggest inconvenience is not being able to operate an office from the brewery: can't do research, online designs, ordering, invoicing, tracking bills and other office work is too slow and too expensive.

These sample business case studies indicate the urgent need for improved broadband services and suggest that expanded business opportunities are being hampered by the lack of reliable and affordable broadband. Advocating for improved quality broadband infrastructure is in everyone's best interest because it results in higher property values, more business activity, and generates more municipal revenue for the benefit of the entire community. Research indicates that broadband services can enable rural communities to thrive while rural areas without broadband are likely to decline.

The Intelligent Communities Forum has stated: "Today, broadband offers every community the opportunity to move from the periphery to the center and create a prosperous and inclusive economy, which is the foundation for everything else that makes a community healthy and vital."<sup>16</sup>

**Highlights: Economic Impacts of Providing/Not Providing Rural Broadband**

Lack of broadband services in rural areas has been shown to lower property values, hinder business operations, and contribute to population declines.

**Conclusion:** By taking immediate action to deploy adequate, affordable broadband to all of Mississippi Mills, the municipality will be able to take advantage of the latest developments in business management, flexible employment options, health care access, educational opportunities, public safety and digital government services.

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<sup>16</sup> [https://www.intelligentcommunity.org/what\\_is\\_an\\_intelligent\\_community](https://www.intelligentcommunity.org/what_is_an_intelligent_community)

#### **d) Optimum Broadband Services Needed**

For the purpose of this report the consultants reviewed analyses of broadband policies and programs conducted by other organizations. In addition to Eastern Ontario Regional Network, related organizations included Eastern Ontario Warden's Caucus, Ontario East Economic Development Commission, Rural Ontario Municipalities Association, Rural Ontario Institute, and others. Key publications of recent academic research on the topic were also reviewed. The CRTC's *Internet Services for Canada* provides a good overview of the salient issues.<sup>17</sup>

#### **Broadband Defined:**

In the context of communication technologies, broadband is used to mean any high-speed Internet access that is always on and faster than dial-up access over traditional analog services. In telecommunications, broadband is wide bandwidth data transmission which transports multiple signals and traffic types. The medium can be coaxial cable, optical fiber, twisted pair cable, or wireless.

Recent growth in demand for high download speed and capacity is creating the expectation that optical fibre and 4G (Fourth Generation) also known as LTE (Long-Term Evolution) wireless will be industry standards. Broadband over optical fibre is considered the optimal delivery method with other delivery technologies such as wireless used in the "final mile" where necessary.

The Rural Ontario Institute's Foresight Papers on rural broadband identified criteria for optimal services:

Applying the CRTC's 50/10 target would likely identify almost all the non-urban parts of the province as unserved... Wherever possible, broadband networks should be built using fibre directly to the premise (often referred to as fibre to the home, FTTH, or fibre to the premise, FTTP). In some parts of the province FTTH will not be economically viable so last-mile connectivity will need to be provided by satellite or fixed wireless technologies. (pg. 9)<sup>18</sup>

There are several methods for assessing the optimal broadband service for rural communities. An international study conducted by University of Osijek, Croatia identified this as a global issue, and articulated four major methodologies for assessing the adequacy of rural broadband services:

- The rate of reduction of "digital divide" (difference between rural and urban broadband access)
- Affordability – with a suggested target that broadband services should not cost more than 5% of the average monthly income (Note: this was a guide for international comparison – Canadian expectations tend to be somewhat lower)

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<sup>17</sup> <https://crtc.gc.ca/eng/internet/>

<sup>18</sup> [http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Rural%20Ontario%20Foresight%20Papers%202017\\_Broadband%20Infrastrucure%20and%20Northern%20Perspective.pdf](http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Rural%20Ontario%20Foresight%20Papers%202017_Broadband%20Infrastrucure%20and%20Northern%20Perspective.pdf)

- Availability – with a suggested target that at least 90% of the rural population should have broadband access
- Equality – with a target that proposes that citizens should have equal broadband access, regardless of rural or urban residency, as well as gender, ethnicity, class, or other aspects of marginalization.<sup>19</sup>

Applying this framework to the situation of rural Canada reveals a number of concerns. Regarding progress on reducing the digital divide in Canada, the Auditor General of Canada and others have pointed out, rural broadband availability has not improved significantly in recent years while urban broadband capacity has grown exponentially. Regarding affordability, on average rural household income is less than urban, while broadband and mobile communication services are more expensive, if they are available at all. Parallel to international standards, the Canadian Radio-television and Telecommunications Commission (CRTC) has recommended that 90% of rural Canadians should have broadband access by 2021.

However, in terms of equality, adequate broadband access is generally considered to be at least 50 Mbps download/10 Mbps upload (50/10 Mbps) in urban areas, while current rural targets under the Connecting Canadians program of Innovation, Science and Economic Development Canada are much lower, at 5 Mbps download/1 Mbps upload (5/1 Mbps). This is an issue of equity for rural communities.

In summary, it is readily apparent that rural areas without substantial, reliable, affordable broadband infrastructure will suffer increasing disadvantage with economic development, health and safety, as well as overall quality of life. These factors are likely to result in the depopulation and economic decline of communities without adequate broadband access.

#### Highlights: Optimum Broadband Services Needed

Canadian government policy statements and internationally recognized standards reveal that broadband services to most of rural Canada are inadequate.

Conclusion: There may soon be changes in federal infrastructure funding for rural broadband. MM2020 should closely monitor the implementation of programs and projects that enable equity of broadband service in rural communities.

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<sup>19</sup> *A framework for optimal techno-economic assessment of broadband access solutions and digital inclusion of rural population in global information society*  
<https://link.springer.com/article/10.1007%2Fs10209-017-0560-x>

# Phase 1 B: Feasibility of Municipal Support for Single Vendor Offering

## Background

MM2020 survey results and related research revealed that much of rural Mississippi Mills does not have adequate broadband that can deliver the Internet of Things and other digital services. The survey also confirmed that poor access to this critical infrastructure is now inhibiting economic development and quality of life, a circumstance that will only get worse as reliance on internet technologies deepens.

To address the urgency of this matter, MM2020 sought out a vendor willing to investigate a more aggressive rollout of broadband infrastructure and direct-to-residence optical fibre installation in the near term. As a result of MM2020's efforts, a regionally-based supplier has put forward an aggressive plan for the provision of rural broadband services to every rural household in Mississippi Mills, beginning with a "Clayton Pilot" of about 120 homes in the Clayton area in the spring of 2019. The Clayton Pilot proposal has received the support and approval of both the County of Lanark and Municipality of Mississippi Mills for access to the roadbed for the purposes of embedding fibre-bearing conduit for both County and Municipality roads.

This "fibre to the home" proposal sets out specifications and time-lined phases for the delivery of broadband services in the Clayton area and identifies the commercial burden of a substantial rollout cost for the entire rural area of Mississippi Mills. An assessment of the feasibility of financially supporting a specific vendor's implementation plan that meets the needs of the timely deployment of broadband infrastructure to rural Mississippi Mills residents and businesses was completed.

The Clayton Pilot would provide a basis upon which to build the relationship with the vendor regarding substantial financial support for the provision of a fibre-to-premise broadband network to serve the entire rural area of Mississippi Mills.

### a) Feasibility of Single-Vendor Solution

#### Single Sourcing

Definitions and clarity are important in these circumstances. In *A Guide to Developing Procurement By-Laws – Ontario* July 2003; Sole Sourcing and Single Sourcing are defined. Sole sourcing is the procurement of a good or service that is unique to a particular vendor and cannot be obtained from another source. Single sourcing is the procurement of a good or service from a particular vendor rather than through solicitation of bids from other vendors who can also provide the same item. Single sourcing may be the best course to take in some circumstances, but it is important to be transparent in the municipal policies about what those circumstances will be.<sup>20</sup>

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[https://www.toronto.ca/ext/digital\\_comm/inquiry/inquiry\\_site/cd/gg/add\\_pdf/77/Procurement/Electronic\\_Documents/Ontario\\_Govt/MMAH\\_guide.pdf](https://www.toronto.ca/ext/digital_comm/inquiry/inquiry_site/cd/gg/add_pdf/77/Procurement/Electronic_Documents/Ontario_Govt/MMAH_guide.pdf)

An analysis of the provisions of the Ontario Municipal Act, Municipality of Mississippi Mills and County of Lanark Procurement Policies in the context of financial options, (i.e. grants, loans or alternative financial vehicles) available to the Municipality and/or County in providing financial support to a preferred private sector vendor revealed the following:

The Municipal Act – Economic Development Services - Section 107(1) General power to make grants states:

*Despite any provision of this or any other Act relating to the giving of grants or aid by a municipality, subject to section 106, a municipality may make grants, on such terms as to security and otherwise as the council considers appropriate, to any person, group or body, including a fund, within or outside the boundaries of the municipality for any purpose that council considers to be in the interests of the municipality. 2001, c. 25, s. 107 subsection (1).*

More specifically under Loans, guarantees, etc. it states:

*(2) The power to make a grant includes the power (a) to guarantee a loan and to make a grant by way of loan and to charge interest on the loan.<sup>21</sup>*

However, the Municipal Act – Economic Development Services – Assistance Prohibited Section 106 subsection (1) states:

*Despite any Act, a municipality shall not assist directly or indirectly any manufacturing business or other industrial or commercial enterprise through the granting of bonuses for that purpose. 2001, c. 25, s. 106 (1).*

Subsection (2) states:

*Without limiting subsection (1), the municipality shall not grant assistance by: (a) giving or lending any property of the municipality, including money; (b) guaranteeing borrowing.*

While single sourcing a preferred vendor may seem reasonable and plausible under certain circumstances, the context and validity of the premise must be reviewed by the Chief Administrative Officer, Treasurer, and legal counsel for the Municipality of Mississippi Mills to verify compliance with the Municipal Act and Mississippi Mills Procurement Policy Schedule A to By-Law 18 – 14.<sup>22</sup> Additionally, if funding is being sought from or through the County of Lanark, it will be necessary to refer to their Procurement Policy to verify compliance.<sup>23</sup>

Conclusion: Due diligence is required. A financial investment by the municipality and/or county in the deployment of rural broadband in Mississippi Mills by a preferred vendor may be more appealing and viable if the project was either a public-private partnership, public utility or co-operative. The current single vendor proposal should be considered in the context of a public-private partnership model.

<sup>21</sup> <https://www.ontario.ca/laws/statute/01m25>

<sup>22</sup> See Section IX Methods of Procurement Subsection 4 Exemptions to Methods of Acquisition b) Single Source Procurement.

Also see Mississippi Mills Procurement Policy <https://www.mississippimills.ca/en/work/resources/Bylaw-18-14-Procurement-Policy-repeals-12-79-.pdf>

<sup>23</sup> Lanark County Procurement Policy <http://www.lanarkcounty.ca/AssetFactory.aspx?did=6460>

## Private, Co-op, and Public-Private Partnership

Public-private partnerships in Canada, (PPP or P3) is a form of alternative service delivery that involves a formal collaborative arrangement between the public and private sector... This process can be done by pooling resources together to meet a common goal, or simply having the private sector focusing on carrying out specific societal responsibilities. There are several subcategories that P3s can be grouped into. The forms of P3s in Canada include: build–operate–transfer (BOT) or build-own-operate-transfer (BOOT), company-owned-government-operated (COGO), and government-owned-company-operated (GOCO). Public–private partnerships are commonly known for being used for infrastructure projects.<sup>24</sup> The Canadian Council for Public-Private Partnerships provides advice, advocacy, and support for related projects across Canada.<sup>25</sup>

Following are examples of Private, Co-op, and PPP internet service providers that have built fibre-to-the-home networks in rural communities.

WTC Communications provides internet, phone, digital TV, and other communication services to many urban, rural and small towns, like Perth, in eastern Ontario. In other areas rural broadband services are provided by not-for-profit cooperatives. For example, the Quadro Communications Co-operative evolved out of the Blanshard Municipal Telephone System in southwestern Ontario, and now provides a wide range of internet, phone, digital TV, and other computer services. Hay Communications Co-op provides similar services, also in a rural and small-town area of southwestern Ontario.<sup>26</sup>

In Olds Alberta, local community members planned and built Canada's first community-owned fibre-to-the-home (FTTH) network, which makes gigabit speed service available to every residence and business in town. The Olds Institute for Community and Regional Development was formed to build and operate the fibre optic network and the O-Net Internet Service Provider. The Olds Institute was able to finance their projects through a combination of provincial grants, a loan backed by the town, and a line of credit. O-Net staff report that people have moved to Olds because of the level of broadband service available, and long-time residents of Olds have experienced reduced costs of their communication services.

In northern England, rural residents decided to address their lack of reliable broadband service by building their own fibre-to-the-home network. Community members learned how to install fibre, digging their own trenches across fields to connect farms and villages. Broadband for the Rural North, or B4RN, is registered as a non-profit community benefit society, and run by a dedicated local team. B4RN now provides more than 2,300 customers with gigabit broadband, funded by the community.<sup>27</sup>

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<sup>24</sup> PPP [https://en.wikipedia.org/wiki/Public-private\\_partnerships\\_in\\_Canada](https://en.wikipedia.org/wiki/Public-private_partnerships_in_Canada)

<sup>25</sup> Canadian Council for Public-Private Partnerships provides advice, advocacy, and support for related projects across Canada <http://www.pppcouncil.ca/>

<sup>26</sup> For more information see: <https://www.wtccommunications.ca/>; <https://www.quadro.net/>; <https://hay.net/>

<sup>27</sup> Broadband for the Rural North (B4RN) <https://b4rn.org.uk/>

The Eastern Ontario Regional Network (EORN) and the Southwest Integrated Fibre Technology (SWIFT) Network are public-private partnerships developed to improve broadband access in rural Ontario. The first phase of the EORN network was substantially completed in 2014 and offers access to broadband at speeds of 10 Mbps or higher to more than 1 million residents of Eastern Ontario. EORN's future plans focus on mobile connectivity and may resolve cellular service issues in Mississippi Mills. However, some of the infrastructure upgrades required to improve cellular service may offer opportunities to address some back haul and "final mile" broadband requirements.

An Ontario example of a public broadband provider is Lakeland Networks, a division of Lakeland Energy, a municipally-owned utility company. Lakeland Networks offers fibre-to-the-home, as well as services ranging from wireless internet, site to site networking, VOIP, email and web hosting to local IT support, in the area in and around Huntsville and Bracebridge. As a municipally-owned corporation, Lakeland Energy has been able to access funding through sources such as the Building Canada - Small Communities Fund.<sup>28 29</sup>

The Mississippi River Power Corp. (MRPC)<sup>30</sup>, which operates the generating station located in Almonte, is an excellent local example of a municipally-owned and operated utility. The sole shareholder of MRPC is the Corporation of the Town of Mississippi Mills. This well established local public utility offers a model for MM2020 to explore.

#### Highlights: Feasibility of Single-Vendor Solution

**Single Sourcing:** While permissible under some circumstances, clarification regarding Municipality of Mississippi Mills Procurement Policy will be required if substantial funding is being sought from or through the municipality. This action will determine the viability and legality of financial support to a single vendor.

**Co-op, and Public-Private Partnerships:** There are several approaches to the provision of rural broadband services that have been shown to be effective through collaboration between the public and private sectors.

**Conclusion:** Options for Municipality of Mississippi Mills include:

- Form a Public-Private Partnership between a preferred vendor and the Municipality of Mississippi Mills
- Form a Broadband Public Utility division of Mississippi River Power Corporation patterned after Lakeland Energy and Lakeland Networks
- Form a not-for-profit Mississippi Mills Cooperative to own and operate the Mississippi Mills rural broadband service

<sup>28</sup> See ROI Foresight Paper – Broadband pg. 10 – 11

<http://www.ruralontarioinstitute.ca/uploads/userfiles/files/Rural%20Ontario%20Foresight%20Papers%202017%20Broadband%20Infrastructure%20and%20Northern%20Perspective.pdf>

<sup>29</sup> For more information see: <https://www.lakelandnetworks.com/> and <http://lakelandenergy.com/Home/tabid/38/Default.aspx>

<sup>30</sup> MRPC <http://www.mississippiriverpower.com/home.aro>

## b) Financial Support Options and Limitations

The Canadian Internet Registration Authority (CIRA) is a member-based not-for-profit organization, best known for managing the .CA internet domain, developing and implementing policies that support Canada's internet community. CIRA also operates programs and services to help build a better online Canada – safe, secure, and accessible. CIRA's **Community Investment Program (CIP)**,<sup>31</sup> offers grants up to \$100K and one grant up to \$250K for improvements to broadband services, including:

- Infrastructure: Developing connectivity services for regional, rural, remote and/or underserved communities
- Access: Providing individuals and communities with the ability to connect to the internet
- Digital Literacy: Enhancing Canadians' knowledge and skills to use the internet effectively and safely
- Engagement: Research and knowledge-sharing activities that broaden public understanding and participation in Internet policy development and governance.
- Services: Building online apps and platforms that address social, economic and/or environmental needs.

CIRA's Community Investment Program is open to:

- Organizations recognized by Canada Revenue Agency as registered charities
- Not-for-profit organizations
- Academics and researchers affiliated with a Canadian university or college

Conclusion: While it is unlikely that the Municipality of Mississippi Mills would qualify as an applicant for CIRA CIP funding, the municipality and/or MM2020 could partner with a charitable organization, not-for-profit, or an academic/researcher to address one of CIRA's "improvements to broadband services". Application due date is Feb 28, 2019.

The Centre of Excellence in Next Generation Networks (CENGN) has a mission to accelerate the growth of the Canadian Information and Communications Technology (ICT) sector. CENGN is funded by the Networks of Centres of Excellence of Canada (NCE) and Ontario government to accelerate the commercialization process of next generation networking technology.<sup>32</sup>

CENGN has announced its Rural Project Funding to support proof of concept (3 – 6 month) Technology Pilot Trials, each trial designed to test a technical solution to address a northern or rural residential broadband problem statement or showcase a new residential business model for northern or rural broadband. Pilot Project expenses may include: equipment, installation, maintenance, and operating costs. CENGN Rural

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<sup>31</sup> For more information, see: <https://cira.ca/community-investment-program>

<sup>32</sup> For more information about CENGN, see: <https://www.cengn.ca/>

Project Funding will be in the order \$500,000 per project. Selected Vendor(s) will be expected to provide matching investment.

CENGN's Definition of Rural Ontario Community Candidate:

- Limited broadband (less than 50/10) or some access to expensive or capped broadband internet access to all or part of their community
- High level of Municipal support for Pilot Project
- Ability to support a Pilot Project within 1 month of awarding of the RFS to the selected Vendor
- Typically, community is within 100 km of a larger community with high performance broadband internet access
- Typically, South of a line from Parry Sound, to Huntsville, and across to Renfrew

A call for proposals expected for 2 Pilot Projects in Rural Ontario Communities in 2019:

- Prove Technical Solutions based on Problem Statements in 3-6 Month Trials
- Each Pilot will be in the order of \$500,000 from CENGN + matching from Vendor
- Vendor must apply to CENGN for each expense claimed for the Pilot Project

Conclusion: While it may not be timely, the CENGN Rural Project Funding (up to \$500K) could offer matching funds for the planned rural broadband rollout in latter half of 2019 in Mississippi Mills. Since partnering with a vendor is required, the CENGN program could be an attractive solution to the single source vendor option and/or private-public partnership.

Action Required: While the application due date is unknown at this time, MM2020 should maintain contact with CENGN to determine timing of the next Rural Project Funding opportunity for the rural broadband challenge.

The **Connect to Innovate Program**, established by Innovation, Science, and Economic Development Canada (ISED), supports bringing high-speed Internet to rural and remote communities in Canada. In these communities, challenging geography and smaller populations present barriers to private sector investment in broadband infrastructure. This program supports new infrastructure to connect institutions (schools, hospitals, public services) with some funding for upgrades and "last-mile" infrastructure to households and businesses. Typically, the maximum amount of funding an applicant could request for new backbone and new last-mile is up to 75% of total eligible costs.

Eligible recipients under the Connect to Innovate program included entities or groups of entities that are incorporated in Canada, that operate Internet infrastructure, and that meet the assessment criteria. Entities or groups of entities that do not operate Internet infrastructure are eligible provided that they have identified an entity or group of entities that would build, own and operate the network. These included private sector companies, provincial, territorial, and municipal entities, and not-for-profit organizations.

Of related interest, the Auditor General of Canada released a report in the Fall of 2018 that critiqued Connect to Innovate Program and suggested that, although the program has goals that are significant for rural Canadians, the implementation of the program has not been as effective as it could have been. It is anticipated that the 2019 call for applications will address some of the Auditor General's concerns.<sup>33 34 35</sup>

Conclusion: The ISED Connect to Innovate Program (up to 75% of eligible costs) supports bringing high-speed Internet to rural and remote communities. The Municipality of Mississippi Mills could qualify for Connect to Innovate Program funding provided they partner with an entity or group of entities that would build, own and operate the network. This program offers a serious opportunity for Mississippi Mills and could be an attractive solution to a single source vendor option and/or private-public partnership.

Action Required: While applications were not being accepted at this time, the program is scheduled to run until at least 2021. MM2020 should continue to monitor the ISED website for a call for proposals expected to be issued some time in 2019.

The Canadian Radio-television and Telecommunications Commission (CRTC) established the **Broadband Fund** in support of its universal service objective (including service standards) that all Canadians, including those in rural and remote areas, have access to voice services and broadband Internet access services on fixed and mobile wireless networks. The fund will assist communities that are trying to access service at the level of those standards. At the time of this report, the CRTC had not yet published is application guide or call for proposals which are anticipated sometime in 2019.<sup>36</sup>

Conclusion: The CRTC Broadband Fund (\$750million over 5 yrs) is substantial. However, since it is a Canada wide program and currently inactive, it may offer limited opportunity in the near term.

Action Required: Since the CRTC Broadband Fund program is expected to be re-announced in 2019, MM2020 should continue to monitor the website for

### Other Funding Programs to Monitor:

In 2017, the Government of Canada announced support for “Smart Cities” initiatives under the Infrastructure Canada programs. The **Community Support Program** is

<sup>33</sup> For more information about the Connect to Innovate program, see:

<https://www.ic.gc.ca/eic/site/119.nsf/eng/home>

<sup>34</sup> For information about the application process, see: <https://www.ic.gc.ca/eic/site/119.nsf/eng/00002.html>

<sup>35</sup> For the Auditor General's analysis of the Connect to Innovate program, see:

[http://www.oag-bvg.gc.ca/internet/English/att\\_e\\_43221.html](http://www.oag-bvg.gc.ca/internet/English/att_e_43221.html)

<sup>36</sup> For more information on the CRTC Broadband Fund, see: <https://crtc.gc.ca/eng/internet/internet.htm>

designed to support not-for-profit organizations that will provide advisory and capacity-building services directly to communities as they explore and implement smart cities approaches and also support current finalists and future applicants of the Smart Cities Challenge. Although the terminology in the program announcements feature the word “city”, there is a component of the program specifically reserved for communities under 30,000 people to make it accessible for rural areas. The first round of funding is currently in process, as finalists were selected in the summer of 2018 and the winners in each category will be announced in June 2019. It is anticipated that the application process for the second round will also be opened in the summer of 2019.<sup>37</sup>

The Government of Canada has created the **Canada Infrastructure Bank** to provide federal financing that is expected to leverage three to four times the grant amount from the private sector to help pay for necessary infrastructure. Provincial, territorial, and municipal governments are insistent that the definition of “infrastructure” include not only traditional projects such as roads and bridges, but also digital communication infrastructure. Policies are being developed to improve access to loans for smaller scale projects suitable for rural and remote communities, and an announcement about the application process is expected in early 2019.<sup>38 39</sup>

Both Infrastructure Canada’s Community Support Program funding and government of Canada Infrastructure Bank financing initiative are not accepting applications at this time. However, both programs are expected to be re-announced in 2019 and should be monitored as prospective funding sources.

Conclusion: This report, together with MM2020’s inventory of supporting documentation, provides Mississippi Mills with the elements of a “shovel ready” plan to respond quickly to current and future funding opportunities.

Action Required: The Municipality of Mississippi Mills, in collaboration with MM2020, should take an active role in monitoring these important funding programs for announcements.

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<sup>37</sup> For more information on the Smart Cities Community Support Program, see: <https://www.canada.ca/en/office-infrastructure/news/2018/10/backgrounder-government-of-canada-announces-funding-to-help-canadian-communities-explore-and-implement-smart-cities-approaches.html>

<sup>38</sup> Dec 31, 2018 CBC report on Canada Infrastructure Bank initiatives, as well as links to related information, see: <https://www.cbc.ca/news/politics/rural-broadband-internet-infrastructure-bank-1.4962369>

<sup>39</sup> For information about the Canada Infrastructure Bank, see: <https://cib-bic.ca/en/>

## Moving Forward – What’s Next?

### State of Broadband in Rural Mississippi Mills

Due to a number of complex trends, Mississippi Mills will need to take strategic action on many fronts to avoid a decline in population and business activity in their rural areas. Providing reliable broadband services throughout rural Mississippi Mills is an essential component of this strategy. The outstanding response rate to the MM2020 survey of rural resident’s experiences with communication technologies indicated the seriousness of the issues and the urgency to address them. With adequate, affordable broadband, many rural communities similar to Mississippi Mills have been able to take advantage of the latest developments in business management, flexible employment options, health care access, educational opportunities, public safety and digital government services.

Canadian government policy statements and internationally recognized standards reveal that broadband services to most of rural Canada are inadequate. However, there are likely to be new announcements about relevant funding programs during 2019.

Action Required: Mississippi Mills, in collaboration with MM2020, should leverage the MM2020 accomplishments to date, monitor developments in relevant funding programs and collaborate with applicants where there is a good strategic fit.

### Feasibility of a Single Vendor Partnership Model

While Single Sourcing is permissible under some circumstances, clarification regarding Municipality of Mississippi Mills Procurement Policy will be required if substantial funding is being sought from or through the municipality. Financial investment by the municipality and/or county in the deployment of rural broadband in Mississippi Mills by a preferred vendor may be more appealing and viable if the project was a public-private partnership, public utility or co-operative.

The Mississippi River Power Corp. (MRPC) which operates the generating station located in Almonte, is an excellent local example of a municipally-owned and operated utility. The sole shareholder of MRPC is the Corporation of the Town of Mississippi Mills. This well established local public utility offers a model for MM2020 to explore.

Action Required: Determine which of the following models best suit the circumstances:

- A Public-Private Partnership between a preferred vendor and the Municipality of Mississippi Mills
- A Broadband Public Utility division of Mississippi River Power Corporation patterned after Lakeland Energy and Lakeland Networks
- A not-for-profit Mississippi Mills Cooperative to own and operate the Mississippi Mills rural broadband service

## Building and Leveraging Influential Alliances

The Intelligent Communities Forum (ICF) sponsors conferences, workshops, and contests, and provides resource materials for “smart community” approaches. ICF Canada has recently released “From Connectivity to Community”, a new guidebook developed to help Canadian communities turn enabling technology, especially broadband and other digital assets, into economic growth, stronger social and community bonds, and a better quality of life for its citizens. It is built on the assumption that the community already has adequate broadband connectivity in place and is ready to take advantage of that infrastructure.<sup>40</sup> Infrastructure Canada has designed the Smart Cities Community Support Program specifically to provide financial support for local organizations that are moving ahead with smart community initiatives such as those sponsored by ICF.

The key to the success of challenging, complex projects is often found through strategic networking and collaboration. The MM2020 project has relied heavily on informal networking to move as far as they have toward their goals. In addition to informal networking and expansion of the circle of volunteers, more formal collaboration with organizations that have compatible goals will greatly expand the opportunities for progress. The Mississippi Mills area provides an advantageous context for this approach, as there are many local residents with significant experience in government or high-tech industries. To move ahead to the next phases, the MM2020 group may need to strategically recruit local volunteers with specific expertise in analysis of government policies and programs, and in writing funding applications. Fortunately, there are many potential allies with which MM2020 could partner.

Eastern Ontario Regional Network (EORN) was created to address the serious issue of lack of access to reliable, affordable communication technologies across the region. Their mission is to provide higher speeds and bandwidth to at least 95 per cent of homes and businesses in Eastern Ontario. The network has been built with the support of federal, provincial, municipal, and private sector partners.

The EORN approach is highly compatible with the goals of the MM2020 initiative:

Whenever possible, EORN will work to mobilize diverse groups of stakeholders throughout the region to work together on shared goals and objectives of the Digital Strategy. EORN will not duplicate the efforts of other groups and organizations. In fact, others may take the lead on specific initiatives that emerge out of the Digital Strategy.<sup>41</sup>

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<sup>40</sup> For more information, see:

<https://icf-canada.com/icf-canada-launches-new-guide-from-connectivity-to-community/>

<sup>41</sup>[https://www.eorn.ca/en/resources/Digital\\_Strategy/EORN\\_Digital\\_Strategy\\_Executive\\_Summary\\_2015.pdf](https://www.eorn.ca/en/resources/Digital_Strategy/EORN_Digital_Strategy_Executive_Summary_2015.pdf)

In addition, EORN is an excellent source of the latest information about government policies and programs relevant to rural broadband. A recent EORN notification included:

The Ontario government has announced it will release a broadband and cellular strategy in early 2019, outlining plans to expand broadband, digital services, and cellular access in both unserved and underserved areas.<sup>42</sup>

The Ontario Federation of Agriculture (OFA) is advocating for improved rural broadband, because lack of access to current communication technology is hindering adoption of precision agriculture, efficient crop and herd management, and development of agri-food businesses.<sup>43</sup>

The Ontario Chamber of Commerce (OCC) has added their voices to others who are calling for the recognition of high-speed internet access as an essential service. Allan O’Dette, President and CEO of the OCC has said: “Just as businesses depend on roads and electricity, high-speed Internet is fundamental to advancing the province’s economic interests... Committing funds to broadband infrastructure in rural and remote regions of the province will ensure that economic fragmentation is reduced in Ontario”.<sup>44</sup>

The Canadian Postmasters and Assistants Association (CPAA) is advocating for enhanced services for rural post offices. Not only is online shopping increasing the volume, composition and essential nature of rural postal operations, but rural post offices in some areas are also providing other services in rural areas. Innovative projects that have shown some success in rural communities include: post office banking services, alliances with libraries that loan not only books but other items such as tools, and community internet access points.<sup>45</sup>

The County of Lanark is working with Valley Heartland Community Futures Development Corporation (VHCFDC) and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) on county-wide economic development and business retention and expansion.<sup>46</sup> Many of the most-promising business ideas require access to robust and reliable broadband and mobile services. In some rural communities, similar economic development strategies have led to the establishment of rural business incubation and tele-working centres, which are only viable where robust communication technologies are available.

The Lanark County Economic Development Strategic Plan 2018 - 2020, pgs. 32–33 states these action items regarding Broadband Infrastructure:

- Work with and support EORN, EOWC, MM2020 and other related partnerships.

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<sup>42</sup> <https://www.eorn.ca/en/Modules/News/index.aspx?feedId=40a60835-8f83-4765-a89e-9bc1375edeaa&newsId=9590bfc0-4d34-4add-8606-cb5f3e3e0776>

<sup>43</sup> OFA <https://ofa.on.ca/newsroom/feds-fall-short-on-rural-broadband-promise/>

<sup>44</sup> OCC <https://occ.ca/mediareleases/ontario-chamber-of-commerce-calls-on-the-provincial-government-to-push-broadband-strategy-into-high-speed/>

<sup>45</sup> CPAA <http://cpaa-acmpa.ca/pub/index/index.cgi?language=en>

<sup>46</sup> VHCFDC <https://www.valleycfdc.com/lanarkcountynecdev>

- Host a workshop to educate economic development related positions (EDOs, CAOs, etc.) on the impact of increased Broadband and its effect on business growth.

However, a review of the current Mississippi Mills Community Official Plan (COP) found no mention of broadband infrastructure, internet, or mobile services. MM2020 has and will continue to monitor the COP process and advocate for the inclusion of broadband especially in sections 3.6 Residential; 4.4 Economic Development; and 3.8 Gov't and Essential Services. Given that MM2020 is acknowledged as a good example of community-based rural broadband project, continued monitoring of local planning and of the implementation of the VHCFCDC/Lanark County Economic Development Strategic Plan would be wise. There may be opportunities to leverage the MM2020 accomplishments to secure additional funding as it becomes available.

Action Required: MM2020 should:

- Strategically recruit local volunteers with specific expertise in analysis of government policies and programs, and in writing funding applications
- Engage and work with strategic partners like EORN, OFA, OCC, CPAA, VHCFCDC, OMAFRA to leverage opportunities for support
- Continue to monitor the Community Official Plan process and advocate for the inclusion of broadband infrastructure as an essential service
- Explore the possibility of a pilot project to demonstrate the feasibility and benefits of rural broadband access

## Appendix A: MM2020 Clayton Pakenham Surveys and Data

<b>Clayton South K0A1P0 Dissemination Area 35090115</b>	<b>Total</b>
Population and dwellings	
Population, 2016 Census data	543
Total private dwellings	223
Private dwellings occupied by usual residents	217
Average household size	2.5
Total - Distribution (%) of the population by broad age groups	
0 to 14 years	13.9%
15 to 64 years	67.6%
65 years and over	19.4%
85 years and over	0.9%
25 to 44 years % of total population	17.9%
Median age of the population	49.1
Median total income of two-or-more-person households in 2015	\$107,648
Prevalence of low income: Low-income cut-offs, after tax (LICO-AT)	2.8%
Total labour force population aged 15 years and over by occupation - National Occupational Classification (NOC) 2016	360
Occupation - not applicable	10
All occupations	350
0 Management occupations	40
1 Business, finance and administration occupations	60
2 Natural and applied sciences and related occupations	25
3 Health occupations	15
4 Education, law and social, community and government services	35
5 Occupations in art, culture, recreation and sport	25
6 Sales and service occupations	55
7 Trades, transport and equipment operators and related occupations	60
8 Natural resources, agriculture and related production occupations	25
9 Occupations in manufacturing and utilities	10

<b>Clayton East – Blakeney K0A2X0 Dissemination Area 35090105</b>	<b>Total</b>
Population and dwellings	
Population, 2016	1,038
Total private dwellings	449
Private dwellings occupied by usual residents	422
Average household size	2.5
Total - Distribution (%) of the population by broad age groups	
0 to 14 years	15.9%
15 to 64 years	62.3%
65 years and over	22.2%
85 years and over	1.4%
25 to 44 years % of total	22.7%
Median age of the population	48
Median total income of two-or-more-person households in 2015	\$106,368
Prevalence of low income: Low-income cut-offs, after tax (LICO-AT)	3.4%
Occupation - National Occupational Classification (NOC) 2016	
Total labour force population aged 15 years and over by occupation - National Occupational Classification (NOC) 2016	615
Occupation - not applicable	0
All occupations	610
0 Management occupations	45
1 Business, finance and administration occupations	95
2 Natural and applied sciences and related occupations	50
3 Health occupations	60
4 Education, law and social, community and government services	95
5 Occupations in art, culture, recreation and sport	15
6 Sales and service occupations	85
7 Trades, transport and equipment operators and related occupations	135
8 Natural resources, agriculture and related production occupations	0
9 Occupations in manufacturing and utilities	20

## Appendix B: Commuting to Work / Work from Home

	Mississippi Mills Total	Almonte	Rural Mississippi Mills
Labour Force	6,990	2,535 36.3%	4,455 63.7%
Commute to Work	5,045	1,900	3,145
Commuting Outside Lanark County	3,030	1,075	1,955
Working from home	710	200	510

Source: Statistics Canada, 2016 Census, Community Profiles

Total labour force population aged 15 years and over

Commuting destination for the employed labour force aged 15 years and over with a usual place of work.

Commuting outside CD includes commuting to Ottawa, and other counties - Renfrew Co, Leeds & Grenville Co, etc. Probably the majority is to Ottawa.

## Appendix C: Five Common Approaches to Need

Type of Need	Definition/ Determination	Example
Normative Need	Expert Opinion	Canada Food Guide
Felt Need	Personal feeling or opinion	Preference: likes/dislikes
Expressed Need	Requests, demands	Response to survey
Supplied Need	Supplier of product or service	Foreign Aid (where giver determines what is given)
Comparative Need	Difference between comparable groups	Low Income Cut Off

## Appendix D: Clayton and Pakenham Survey Questions & Responses

Total number of responses 791

Does any member of your family telecommute from a home office?			
Yes	No	NR	
38%	60%	2%	Incl. NR
39%	61%		Not incl. NR

Do you operate a home-based business?			
Yes	No	NR	
29%	65%	6%	Incl. NR
31%	69%		Not incl. NR

Comments:

• Employed elsewhere but also work from home	16
• Home-based business - trades & crafts	20
• Home-based business - IT or consulting	32
• Home-based business - other sales & services	12
• Farm or agriculture related business	10
• Complaints about IT - obstacle to working from home	13
Total Comments	103

If so, do you buy/sell goods online (eCommerce)?			
Yes	No	NR	
29%	61%	10%	Incl. NR
33%	67%		Not incl. NR

Note:

Ambiguous question - some answers may be personal shopping, some home-based business. Many people who answered "No" to home-based business answered "Yes" to eCommerce.

Total amount your household spends monthly on Home phone + Internet + Satellite TV:		
Range	\$30	\$1,000
Zero or NR	42	
Average of those reporting	\$206	

Do you have a land-line home phone?			
Yes	No	NR	
61%	36%	3%	Incl. NR
63%	37%		Not incl. NR

Note: Some may not have understood the question. Some said their land line came via internet or VOIP.

Is home phone service reliable?			
Yes	No	NR	
61%	25%	13%	Incl. NR
71%	29%		Not incl. NR

Comments re home phone:

- Problems with landline - static, service outages, poor customer service 105 50%
- Land line quality and service OK - some have concerns about cost 34 16%
- Use VoIP, Comwave, etc. some have concerns about quality of service 32 15%
- Use cell phone for home phone - with problems 27 13%
- Use cell phone for home phone - no problems reported 11 5%
- Total number of comments: 209

Typical comments about home phone or landline service included:

- Rainy weather we had so much static the land line was useless; never permanently fixed. It's why we got rid of it.
- Can hear other conversations when I'm on the phone
- Crackly often especially when it rains. Old telephone lines. Can't even get Bell internet as lines too old.
- We have a long and old line coming into our property. Almost every year we need to have a Bell tech come out to do repairs on the line.

Do you have a cellular phone?			
Yes	No	NR	
92%	5%	2%	Incl. NR
94%	6%		Not incl. NR

Cell Service Provider				
Bell	Rogers	Telus	Virgin	Other: Koodo, Fido, PC Mobile, Chatr, etc.
265	107	184	58	89 (703 total responses)
38%	15%	26%	8%	13%

Note: Many had multiple responses – one respondent indicated 7 cell phones in the household.

Do you receive a cellular signal at your home address?			
Yes	No	NR	
533	232	26	
67%	29%	3%	Incl. NR
70%	30%		Not incl. NR

Any comments on cell phone service? (502 comments)		
Poor signal	Good cell service	Other (mostly high cost)
457	36	9
91%	7%	2%

Sample comments re cell service:

- Use landline at home, cell phone for outside use.
- Not strong have to move around to find a strong signal.
- No signal in house. Decent signal half-way between house and road.
- Often drops calls, depending on where we are in the house. Frustrating!
- Expensive and not always reliable.
- Tried to do a conference call from home once and wasn't able to hear anything from anyone on the line. No longer able to take these calls at home.
- It is not reliable as a main phone. It makes telecommuting very difficult.
- Cell phone service is very spotty at this address and is not reliable. This creates an issue as this is my only form of communicating in an emergency.
- It is very poor. Causes safety issues for workers. Limits use of technology in business operations in the field as smart phone cannot connect with monitoring devices.
- I receive some signal at home, but my calls do not always come in... This is my business phone and it looks horribly unprofessional. It's embarrassing.
- One of my friends would have moved here six years ago, but cell phone and internet coverage would not let them work from home.
- I'm paying \$156.00 per month for a cell that I get no reception in my home... This was a real big problem for me when I was on call working at the ... hospital.
- Very poor service... which can mean a loss of work and income as my spouse works for ... and misses on-call texts or calls for overtime.
- In 2015 ... was the lucky recipient of a position with the local paramedic service. Their strict stipulation of employment: answer your phone or return the call within 5 minutes to accept a shift... eventually moved into Carleton Place where cell phone service was reliable.

Who is your Internet provider?				
Storm	Xplornet	Bell	None or NR	Other TekSavvy, FreeNet, AOL, Go Zoom, etc.
274	202	161	85	69
35%	26%	20%	11%	9%

Any comments on Internet service?

Happy Bell	Total Bell	Complaints Bell	Happy Storm	Total Storm	Complaints Storm	Happy Xplornet	Total Xplornet	Complaints Xplornet	Total comments
18	105	87	73	159	86	23	151	128	415
4%		21%	18%		21%	6%		31%	% of total comments
16%		83%	46%		54%	15%		85%	% of comments by provider

Sample comments re Internet:

- If we had known there was no good internet service available at this house when we bought it, we would not have bought this one.
- Storm service is generally good but there are times it is slow and interrupted
- It is adequate, and their technical service is good. The price is not competitive, but we really don't have any other options.
- Service is generally reliable, but bandwidth and latency limit usefulness. Unable to reliably stream video, videoconference, or use VoIP.
- It is so slow I can't do my work from home - I drive into town and use my cell phone as a hotspot to send e-mails.

Do you have school age children in your home?			
Yes	No	NR	
213	566	12	Total: 791
27%	72%	2%	Incl. NR
27%	73%		Not incl. NR