The State of Rural Cell and Internet Service in Manitoba

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Keystone Agricultural Producers (KAP) has been advocating for years for improved broadband and cellular service in rural Manitoba. KAP members are some of the most poorly served by telecommunications in Canada. They live and run their businesses in rural areas with low population density, limiting the incentive for service providers to invest in the necessary infrastructure to provide sufficient coverage.

Agriculture is a primary economic driver provincially and nationally. However, lack of access to reliable and affordable broadband internet prevents farmers from being able to take advantage of opportunities and prevents them from accessing essential services which can lead to both health and safety risks. Modern communications services, including high-speed internet access and comprehensive cellular phone coverage, are critical to the success of modern agricultural operations, the safety of all Manitobans, and the overall quality of life for rural residents. The following report has been put together to provide an overview of the current state of cell and internet service in rural Manitoba to inform KAP's lobbying efforts moving forward on this file.

Rural Cell and Internet Service Survey

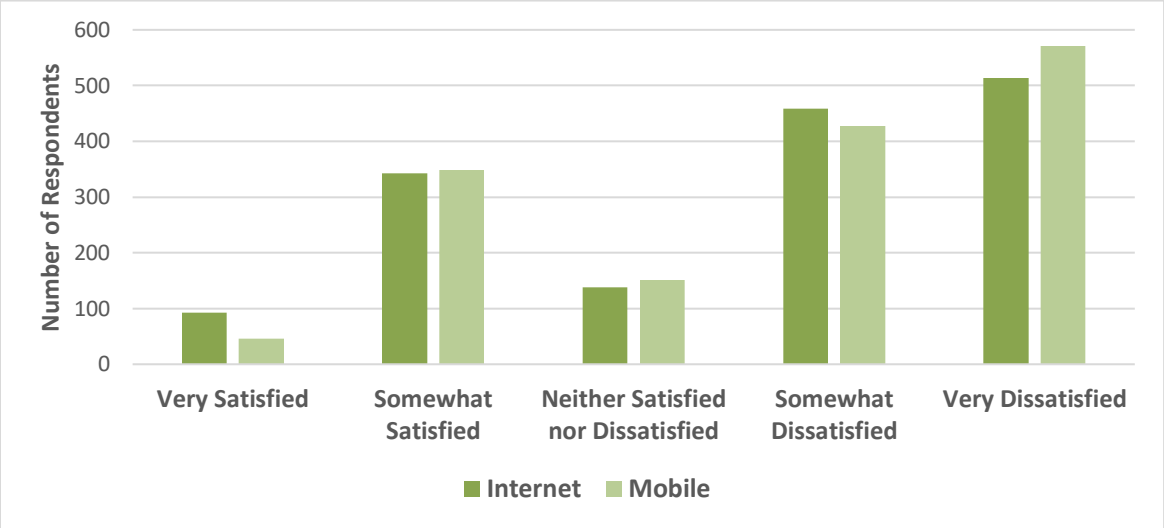
To gain a better understanding of rural residents' experiences, Keystone Agricultural Producers (KAP) conducted a survey to collect data on cell and internet service in rural Manitoba. The survey launched on February 19, 2020 and closed on March 31, 2020. The survey collected data on respondents' level of satisfaction with internet/cell service in rural areas, frequency of service disruptions, impacts of service disruptions, service providers used in rural areas, and demographics (age, location, farmer/non-farmer).

In all, KAP received 1,557 submissions from across the province. Responses were split nearly in half between farmers (48.9%) and non-farmers (51.1%), indicating the importance of this issue for all rural residents. In terms of the age distribution of respondents, 29.4% of respondents were under the age of 35, 36.5% were between the ages of 35 and 54, and the remaining 34.1% were 55 and older. Of the 137 municipalities in Manitoba, 113 were represented in the dataset.

Respondents were first asked to rate their satisfaction with the level of service they receive for both internet and mobile phone services. As can be seen in Figure 1 below, the pattern of responses was quite similar for both internet and mobile service and indicates a high level of overall dissatisfaction. Accordingly, 62.9% of respondents reported being either somewhat or very dissatisfied with their

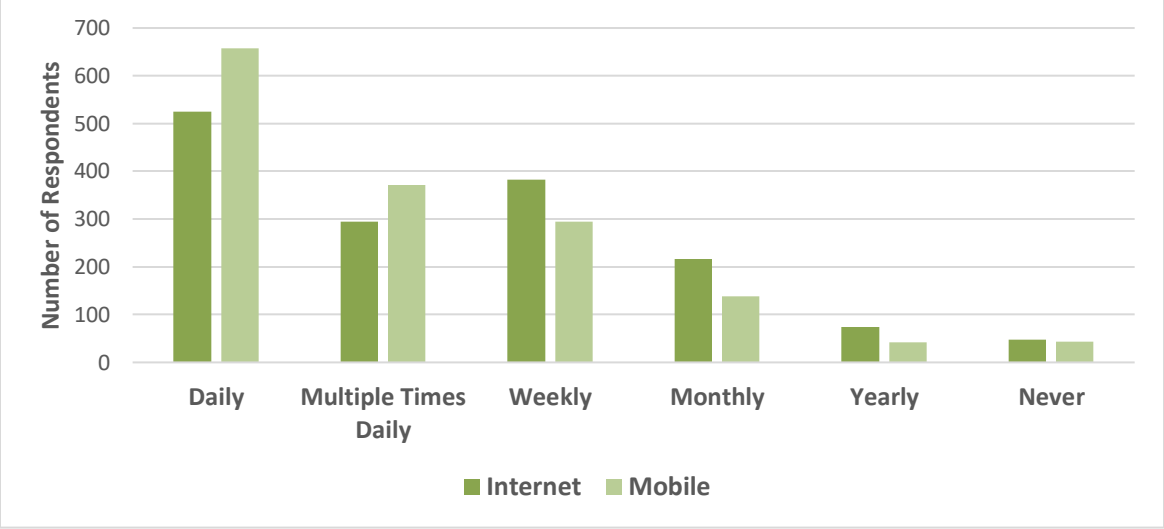
internet service, and 64.6% reported being either somewhat or very dissatisfied with their mobile phone service.

Figure 1. Level of satisfaction with internet and mobile services



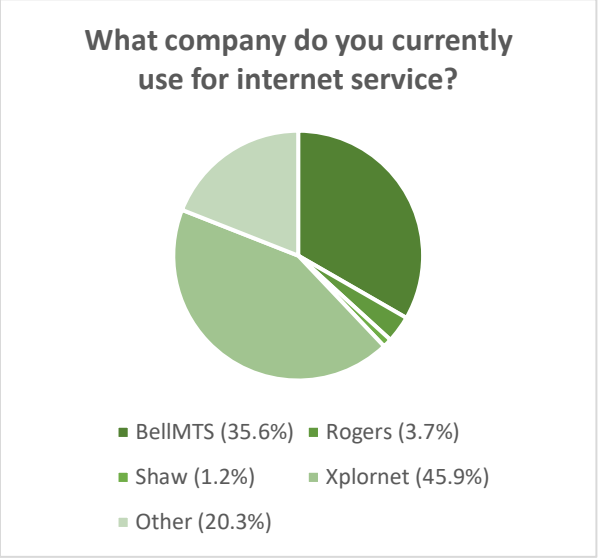
Next, respondents were asked to share how often they experience disruptions with their service. Just over 50% of respondents reported experiencing internet service disruptions at least daily, if not multiple times daily, whereas 66.5% of respondents indicated they experience mobile phone service disruptions at least once a day, if not multiple times daily. Based on these results, it appears that mobile phone service disruptions are slightly more common than internet service disruptions.

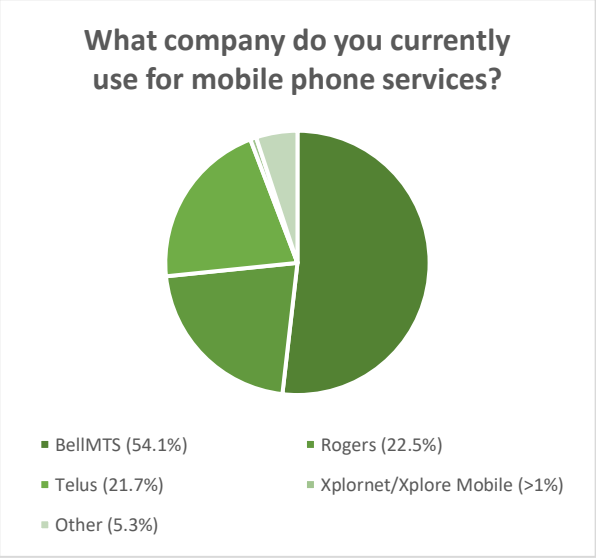
Figure 2. Frequency of service disruptions of internet and mobile services



Respondents were asked to identify their service providers for both mobile phone and internet service. Xplornet was the most popular choice for internet service providers, followed by BellMTS. However, many respondents noted that Xplornet was the only internet provider available in their area. Other internet service providers that were frequently mentioned include Westman Communications, RFNOW, and some respondents noted their internet is provided through a fibre optic network installed by their local RM.

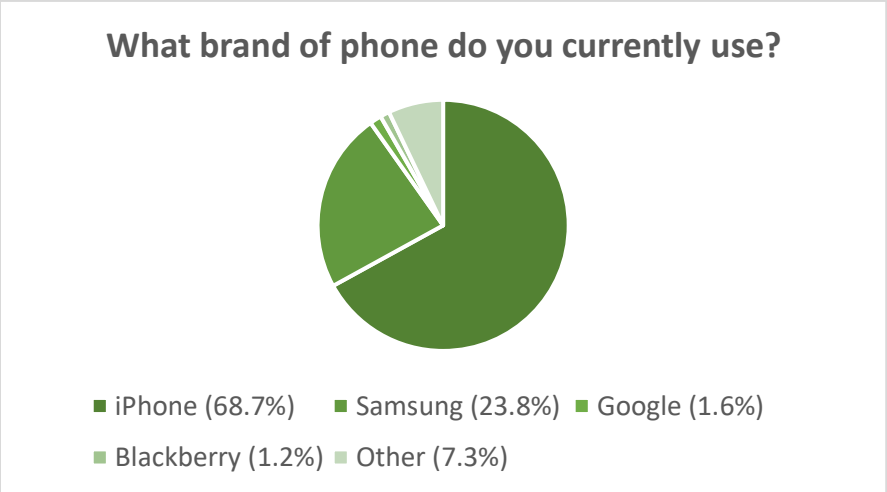
Figure 3. Service providers for internet and mobile phone services





As for mobile phone services, more than half of respondents indicated that their service is provided through BellMTS. The remainder of respondents were mostly split between Rogers (22.5%) and Telus (21.7%). As for the brand of phone used, iPhones were by far the most popular choice (68.7%), followed by Samsung (23.8%).

Figure 4. Phone brands used by survey respondents



Respondents were also asked to share the details of how internet and mobile phone service disruptions impact their lives. For internet service, the majority of responses fell into four broad categories: business, personal, education, and safety.

For business impacts, respondents noted that internet service disruptions affected the ability to conduct regular business interactions such as bookwork, emails, payment processing, online banking, troubleshooting issues, as well as leading to missed opportunities and lost sales. For farming in particular, respondents mentioned the impact of disruptions on processes such as participating in online auctions, retrieving field data, accessing grain markets and trades, as well as monitoring calving with cameras. Some respondents noted that they are unable to invest in new technologies that would aid their business due to the lack of a fast and reliable internet connection.

As far as personal impacts, many respondents noted disruptions in streaming videos, Netflix, and video games. There was also an isolation factor reported by some respondents who are unable to call family and friends and miss out on social media interactions due to their inability to connect online.

For education, some respondents noted that they are unable to participate in online webinars, access online course materials and study resources, as well as conduct research for schoolwork.

In terms of safety, respondents described being unable to look up highway conditions or weather reports. Other safety concerns had to do with the reliability of alarm systems and security cameras that depend on internet service.

As for the impacts of mobile phone service disruptions, the majority of responses related to business and safety concerns. A common response was that respondents were not confident that they would be able to place a call to emergency services if ever they experienced a medical emergency in a rural area. For this reason, many respondents indicated that they either felt obligated to keep a home landline or re-install a landline for the sole purpose of emergencies.

Respondents were also given the opportunity to provide any additional thoughts or comments on the topic at the end of the survey. While the comments varied, the main message that came across is that rural residents are frustrated paying either the same rates or more than urban residents for sub-par service. As one respondent noted “this is the biggest issue holding rural Manitobans back.”

The Urban/Rural Connectivity Divide

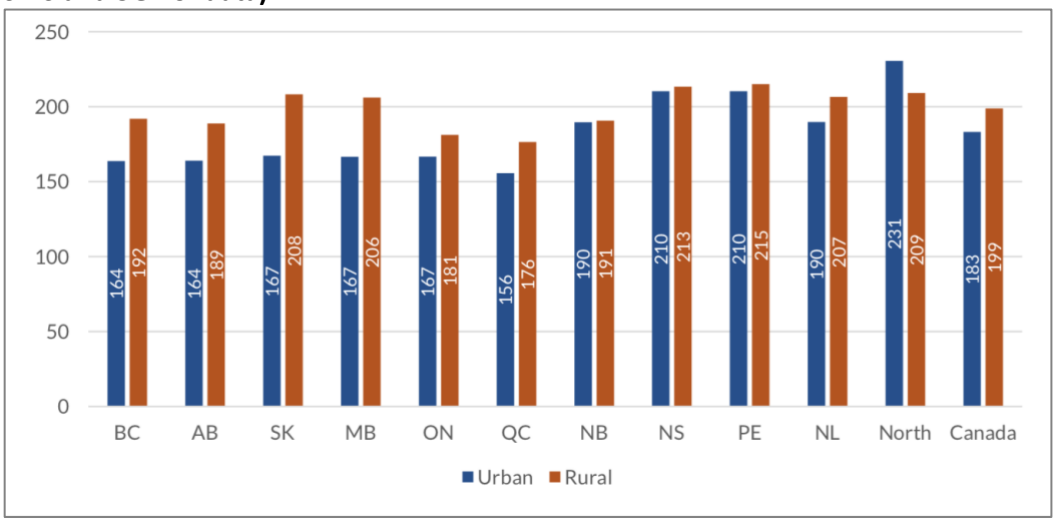
The survey responses above provide anecdotal evidence that rural residents are paying higher rates for lower levels of service compared to their urban counterparts. This is confirmed in the findings in the Canadian Radio-television and Telecommunications Commission (CRTC)’s 2019 Communications Monitoring Report.[1]

The report found that in 2018, across Canada, the average combined price for communication services was indeed lower in urban areas than in rural areas. This is illustrated in Figure 5 below. The data is also broken down by province and indicates that Manitoba had the second highest price gap between urban and rural areas at $39, which equates to a difference of about 20% between urban and rural prices.

[1] Canadian Radio-television and Telecommunications Commission, Communications Monitoring Report 2019, https://crtc.gc.ca/pubs/cmr2019-en.pdf

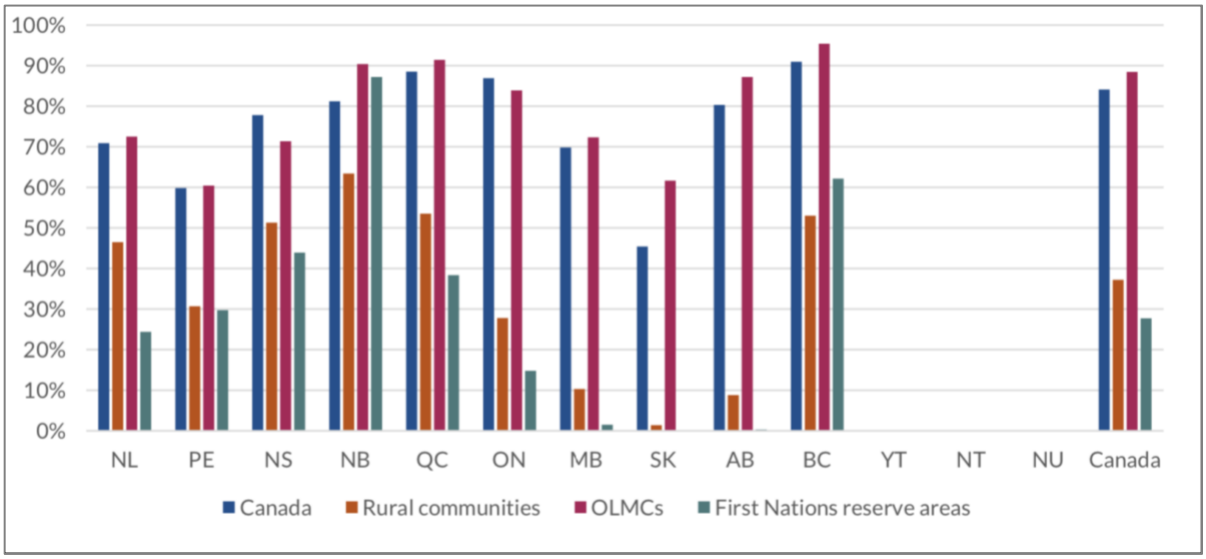
As for internet service, the report found that, across Canada, 50/10 Mbps unlimited broadband speeds were available to 84.1% of Canadians in 2017. In comparison, when looking solely at rural communities, only 37.2% had access to these same speeds across the country. This is illustrated in Figure 6, which also shows the breakdown of 50/10 speed availability by province. Focusing specifically on Manitoba, the figure shows that Manitoba has one of the lowest levels of availability of 50/10 speeds in rural communities, behind Alberta and Saskatchewan, and the three territories whom notably do not have any access to 50/10 speeds.

Figure 5. Average combined reported prices for communications services by province/region, 2018 ($/month) Basic television, basic wireline telephone, Internet (25/3) and mobile (unlimited voice & SMS and 5GB of data)



Source: CRTC Communications Monitoring Report 2019

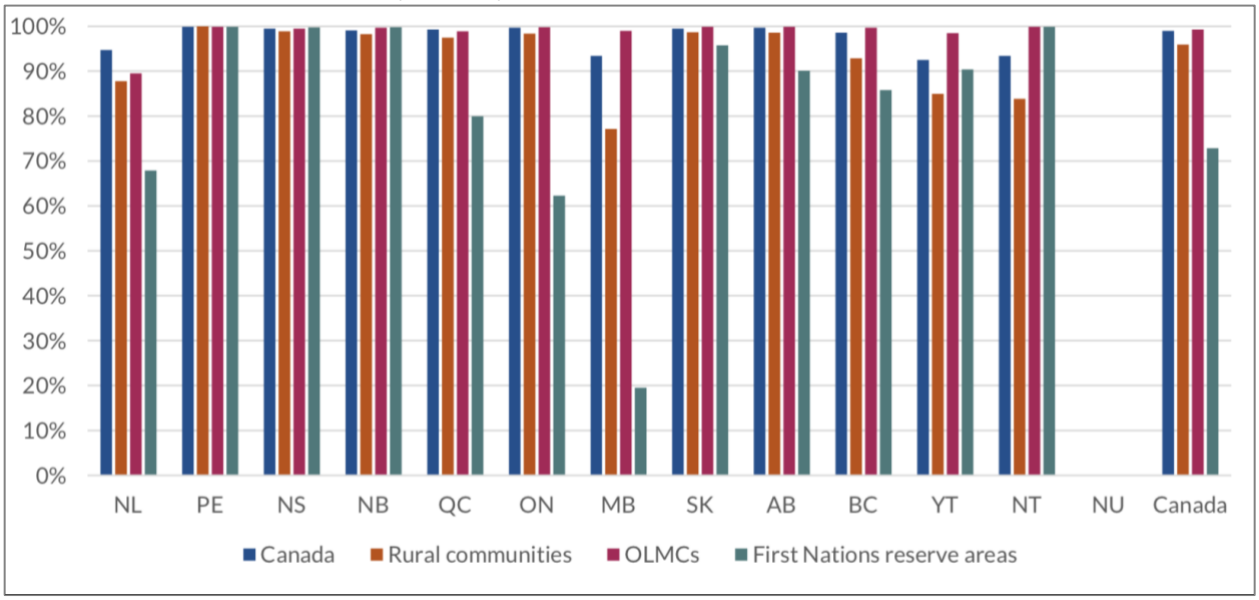
Figure 6. Broadband service availability at 50/10 Mbps unlimited in the provinces and territories in 2017 by household, in Canada overall, and in rural communities, OLMCs, and First Nations reserve areas



Source: CRTC Communications Monitoring Report 2019

When looking at mobile service coverage, the discrepancy between urban and rural service levels was less pronounced in comparison to internet services. LTE availability was reported for 99.0% of Canadians, and 95.9% of rural communities across Canada. With that being said, Manitoba appears to be lagging the furthest behind in terms of rural availability, as Figure 7 below shows that Manitoba is the only province/territory to have LTE coverage in less than 80% of its rural communities. LTE coverage is also significantly lagging in Manitoba's First Nations reserve areas compared to the rest of the country.

Figure 7. Mobile service availability (LTE) by province and territory in 2017, by population in Canada overall and in rural communities, OLMCs, and First Nations reserve areas



Source: CRTC Communications Monitoring Report 2019

In addition to the differences between urban and rural pricing and service levels, the report also found that those living in rural communities tended to have fewer internet service providers to choose from, lower monthly data transfer limits, and fewer providers offering unlimited data transfer with their lowest-price offering than their urban counterparts.

Based on the findings from the KAP survey along with the findings from the 2019 Communications Monitoring Report, it is evident that the urban/rural digital divide exists and action is required to ensure that rural residents can access the same technologies and opportunities as urban residents.

Canada's Connectivity Strategy

In December 2016, the Canadian Radio-television and Telecommunications Commission (CRTC) announced that broadband internet access would be deemed a basic service across Canada and set new targets for download speeds of at least 50 megabits per second, upload speeds of at least 10 megabits per second, and unlimited data options.[2] These were the speeds that were deemed necessary to be able

[2] Government of Canada, CRTC establishes fund to attain new high-speed Internet targets, News Release, https://www.canada.ca/en/radio-television-telecommunications/news/2016/12/crtc-establishes-fund-attain-new-high-speed-internet-targets.html

to use cloud-based software applications, government services, online learning resources, and to stream high definition videos.

In 2019, the Government of Canada released a report entitled High-Speed Access For All: Canada's Connectivity Strategy, which outlines how the government intends to have all Canadian households connected to the CRTC's targeted speeds by 2030, as well as improve mobile phone service across the country.[3] As discussed in the previous section, 50/10 speeds are accessible to 84% of Canadian households but only 37% of rural Canadian households. Through the strategy, the Government aims to have 90% of Canadians connected to the 50/10 speeds by the end of 2021, 95% connected by 2026, and 100% by 2030. The three pillars of the strategy are 1) high-speed access for all Canadians, 2) investing for impact, and 3) partnering for progress.

Two key aspects of the strategy for connecting all Canadians are promoting scalable investments and leveraging different technologies. To ensure that funding is being spent in an efficient and forward-thinking manner, investments will be focused on infrastructure projects that are scalable, meaning they will only require incremental investment to accommodate for higher speeds in the future (such as fibre optics). Other key considerations include affordability, quality of networks and network resiliency.

According to the strategy, it is estimated that achieving the goal of connecting all Canadians will require a total investment of around $8 billion. The strategy details a variety of funds and programs that the Government of Canada has established to achieve its connectivity targets, which all together will mobilize up to $6 billion. A summary of these programs can be found below in Table 1. These programs are mainly focused on providing funding for backbone and last-mile infrastructure projects to connect unserved or underserved communities in rural and remote areas of the country.

Table 1. Federal Funding Programs/Initiatives for Connectivity

Program	Funding Available	Status
Universal Broadband Fund	$1 billion	Launching 2020
Connect to Innovate	$500 million	Ongoing
CRTC Broadband Fund	$750 million	Ongoing
Canada Infrastructure Bank	$1 billion	Ongoing
Rural and Northern Stream of the Investing in Canada Infrastructure Program	$2 billion	Ongoing
Accelerated Investment Incentive	N/A	Ongoing
First Nation Infrastructure Fund	N/A	Ongoing
Connecting Canadians	$225 million	Completed

Source: High-speed Internet for all of Canada, Innovation, Science and Economic Development Canada, https://www.ic.gc.ca/eic/site/139.nsf/eng/home

[3] Innovation, Science and Economic Development Canada, High-Speed Access for All: Canada's Connectivity Strategy, https://www.ic.gc.ca/eic/site/139.nsf/eng/h_00002.html

The government has committed to working closely with partners to ensure investments are coordinated and effective. For example, the Connect to Innovate program leveraged public and private partnerships, essentially doubling the investment committed to by the federal government. The importance of these partnerships is also reflected when looking at the investments made in Manitoba. Two rounds of investments were announced in Manitoba through the Connect to Innovate program, in 2018 and 2019 respectively, for a total contribution of $51.4 million from the program. Accompanying both of these announcements were additional investments from Indigenous Services Canada, the Government of Manitoba, as well as investments from some of the internet service providers themselves, and others, which brought in an additional $42.8 million in investments, nearly doubling the original investment through Connect to Innovate (see Table 2).

Table 2. Connect to Innovate and Related Funding Announcements in Manitoba

Source	Funding	Year
Connect to Innovate	$43.7M	2018
Indigenous Services Canada	$3.5M	2018
Government of Manitoba	$20M (in-kind)	2018
Other Contributors	$16.7M	2018
Connect to Innovate	$7.7M	2019
Valley Fibre Limited	$2.3M	2019
High Speed Crow	$264,640	2019
Connect to Innovate Total:	**$51,400,000**	
Other Sources:	**$42,764,640**	

Source: Announced Connect to Innovate projects, Innovation, Science and Economic Development Canada, https://www.ic.gc.ca/eic/site/119.nsf/eng/00009.html

Other key aspects of the strategy to invest for impact include targeting government investments to areas that have don't have a strong business case for private sector investment, minimizing overlap with other investments, raising awareness of the importance of access to passive infrastructure, making additional spectrum available to meet demand, and developing policies to facilitate access to spectrum and prepare for next generation satellites.

As for partnering, the Government of Canada highlights the importance of working together with the provinces and territories, municipalities, Indigenous communities, internet service providers, the private sector and other groups to reach the connectivity targets in an efficient manner.

To hold the Government accountable and to track progress, mapping information will be published, along with progress reports in the CRTC's yearly Communications Monitoring Report. There are, however, some concerns about the reliability of these reporting measures; in the Standing Committee on Industry, Science and Technology's *Broadband Connectivity in Rural Canada: Overcoming the Digital Divide* report, the committee states that "according to witnesses, there is a discrepancy between

effective access and access as reported by ISED and the CRTC."[4] This is important to address as such a discrepancy could impact a community's eligibility for project funding, as well as impact the accuracy of progress measurements.

Manitoba's Connectivity Strategy

As far as a provincial connectivity strategy, it does not appear as though the province of Manitoba has any policy or strategy in place to increase broadband or mobile service for its rural residents. During the 2019 provincial election, premier Brian Pallister committed to developing an innovative broadband strategy to expand broadband access in rural and northern Manitoba. Any progress on that has yet to be announced. Other than the in-kind contribution mentioned above which allowed Wekitowak Communications access to Manitoba Hydro's fibre optic cable network and related assets, there has not been any recent investments or activity by the provincial government to encourage connectivity in the province.

In contrast, several other provincial governments have provided support and leadership in improving rural connectivity in their respective province. In their paper *Rural Broadband Development in Canada's Provinces: An Overview of Policy Approaches*, Rajabiun and Middleton provide an overview of the approaches that different provinces have undertaken to improve connectivity in their rural communities.[5]

For example, the government of Alberta invested more than $190 million in the Alberta Supernet, a high capacity fibre and fixed wireless network. In B.C., the government negotiated long-term procurement contracts with Telus where Telus agreed, among other things, to upgrade network facilities and improve rural broadband speeds in exchange for the government using Telus for a wide range of telecommunications and information technology services. In Ontario, the government implemented the Rural Connections Broadband Program which provided $32 million in funding for broadband projects in underserved rural areas of the province.

Benefits of Rural Connectivity

While the benefits of improving connectivity in rural Canada seem intuitive, there is little empirical research available that actually measures the benefits of bringing or improving connectivity to rural communities in Canada.

In his paper Findings on the Economic Benefits of Broadband Expansion to Rural and Remote Areas, Hupka provides an overview of some of the research that has been done to date on the benefits of broadband access in rural communities.[6] He divides the research into six benefit categories: economic growth, business advantages, educational and labour market advantages, rural sourcing, telehealth, and community involvement. While the majority of the studies reviewed in Hupka's paper are from the

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[4] Standing Committee on Industry, Science and Technology, Broadband Connectivity in Rural Canada: Overcoming the Digital Divide, April 2018, 42nd Parliament, 1st Session, https://www.ourcommons.ca/Content/Committee/421/INDU/Reports/RP9711342/indurp11/indurp11-e.pdf

[5] Rajabiun, R., & Middleton, C. (2013). Rural Broadband Development in Canada's Provinces: An Overview of Policy Approaches. In W. Ashton & A. S. Carson (Eds.), [Special issue]. *The Journal of Rural and Community Development,* 8(2), 7-22.

[6] Hupka, Y. (2014). Findings on the Economic Benefits of Broadband Expansion to Rural and Remote Areas. Centre for Urban and Regional Affairs, University of Minnesota. CAP Report no. 188. http://www.cura.umn.edu/sites/cura.advantagelabs.com/files/publications/CAP-188.pdf

United States, it is reasonable to assume that the benefits discussed would also be reflected in the Canadian context.

Through various studies, it has been shown that broadband access improves employment growth rates, per capita GDP and population growth. Business advantages include using broadband for online cost comparisons, e-commerce participation and improved efficiency, although one study did note that issues with reliable connections affected businesses productivity and efficiency. As far as education benefits, Hupka highlights how broadband can increase training opportunities for rural residents through access to tools such as web kiosks and training seminars. Another benefit of bringing broadband to rural areas is the concept of rural sourcing, where rather than outsourcing labour out-of-country, companies can source labour domestically in a more cost-efficient manner by setting up in rural areas where rent is cheaper. An emerging area of opportunity with broadband access is with telehealth. There are many studies that looked at the potential cost savings associated with telehealth. For example, one company estimates that they saved over $30 million on ICU visits between 2004 and 2012. Finally, Hupka highlights the social benefits from broadband access; one study even found a positive correlation with quality of internet connections and levels of community involvement.

There are also environmental benefits associated with improved connectivity. One study looked at the potential reduction in greenhouse gas emissions associated with increased telecommuting in the United States which requires reliable broadband access.[7] They found that, over a ten year period, telecommuting could lead to a 588.2 million tons reduction in greenhouse gas emissions through both direct and indirect effects (i.e. office space not being built, saved office space energy). Another example of the environmental benefit of connectivity is the sharing of documents electronically, rather than physically.

In one of very few studies that look at the economic impacts of broadband access in rural Canada, Ivus and Boland concluded that the deployment of broadband promoted growth in aggregate employment and average wages in service industries in rural regions across Canada.[8] Another notable finding is that there was an opposite effect on employment growth in urban regions, thereby suggesting that broadband deployment can help close the urban/rural employment gap.

Focusing specifically on the agriculture industry, the potential benefits of increased connectivity are numerous and will continue to evolve as technologies evolve and the sector adapts. Below is a table from van Es and Woodward's paper *Innovation in Agriculture and Food Systems in the Digital Age* which lists different technologies that are available to the agricultural sector.[9] These examples highlight the variety of opportunities for the agriculture industry to benefit from improved efficiencies and processes, and related cost savings.

Table 3. Enabling technologies for digital agriculture

[7] Fuhr, J., & Pociask, S. (2011). Broadband and telecommuting: Helping the US environment and the economy, *Low Carbon Economy,* 2 (1), 41-47.

[8] Ivus, O., & Boland, M. (2016). The employment and wage impact of broadband deployment in Canada, *Canadian Journal of Economics,* 48(5), 1803-1830.

[9] van Es, H., & Woodward, J. (2017). Innovation in agriculture and food systems in the digital age, in, WIPO, *The global innovation index 2017*, available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2017-chapter4.pdf

Production environment	Type of technology	Purpose and benefits
Cross-cutting technologies	Computational decision tools	Use data to develop recommendations for management and optimize multitudes of farm tasks
	The cloud	Provide efficient, inexpensive, and centralized data storage, computation, and communication to support farm management
	Sensors	Gather information on the functioning of equipment and farm resources to support management decisions
	Robots	Implement tasks with efficiency and minimal human labour
	Digital communication tools (mobile, broadband, LPWAN)	Allow frequent, real-time communication between farm resources, workers, managers, and computational resources in support of management
Field	Geo-locationing (GPS, RTK)	Provide precise location of farm resources (field equipment, animals, etc.), often combined with measurements (yield, etc.), or used to steer equipment to locations
	Geographic information systems	Use computerized mapping to aid inventory management and to make geographical crop input prescriptions (fertilizer, etc.)
	Yield monitors	Employ sensors and GPS on harvesters to continually measure harvest rate and make yield maps that allow for identification of local yield variability
	Precision soil sampling	Sample soil at high spatial resolution (in zones) to detect and manage fertility patterns in fields
	Unmanned aerial systems (UAS, or drones)	Use small, readily deployed remote-control aerial vehicles to monitor farm resources using imaging UAS
	Spectral reflectance sensing (proximal and remote)	Measure light reflectance of soil or crop using satellite, airplane, or UAS, imaging, or field equipment–mounted sensors, to make determinations on soil patterns, crop, or animal performance, or on nutrient/pest problems
	Auto-steering and guidance	Reduce labour or fatigue with self-driving technology for farm equipment (including robots); can also precisely guide equipment in fields to enable highly accurate crop input placement and management
	Variable rate technology	Allow continuous adjustment of application rates to precisely match localized crop needs in field areas with field applicators for crop inputs (chemicals, seed, etc.)
	On-board computers	Collect and process field data with specialized computer hardware and software on tractors, harvesters, etc., often connected to sensors or controllers
Livestock	Radio frequency ID	Transmit identity data with tags attached to production units (mostly animals) that allow data collection on performance as well as individualized management
	Automated milking feeding and monitoring systems	Perform milking or feeding operations automatically with robotic systems, often combined with sensors that collect

		basic biometric data on animals, thereby reducing labour needs and facilitating individualized animal management

Source: van Es and Woodward (2017) Innovation in agriculture and food systems in the digital age, in, WIPO, *The global innovation index 2017*, available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2017-chapter4.pdf

Last year, the United States Department of Agriculture (USDA) released a report that studied the potential benefits from improved rural broadband and the resulting impacts for precision agriculture technologies.[10] The high-level benefits fit into four different categories: integrated decision making, automated processing and resource allocation, productivity/labor efficiency, and extended reach. The report also estimated the value of maximizing the use of connected technologies in agriculture and found that using the full potential of those technologies could lead to an added $47-$65 billion annually in gross benefits to the U.S. economy, with rural broadband connectivity accounting for more than a third of that value. While the agriculture market in the U.S. is significantly larger than Canada, the overall benefits (increased yields, reduced costs, improved labour efficiencies, and increased revenues through greater market access) are still applicable, if only at a smaller scale.

Conclusion

The purpose of this report was to provide an overview of the state of rural internet and cell service in Manitoba. As evidenced by the results from the KAP survey and the findings in the CRTC's Communications Monitoring Report, the urban/rural digital divide continues to be a problem in Canada, with Manitoba having one of the largest gaps in coverage between urban and rural areas. While the Government of Canada has put together a strategy and committed funding to improve mobile services and connect all Canadians to 50/10 speeds by 2030, immediate action is required to ensure rural Canadians can access the same opportunities as their urban counterparts.

The current global pandemic has highlighted the importance of universal broadband access for staying connected and brought the urgency of the rural/urban digital divide issue to the forefront. In response, the Liberals have recently indicated that they are consulting with telecommunication providers, rural municipalities and other entities to discuss strategies to accelerate their plans to provide broadband coverage to all Canadians, though exact details on how this will be achieved have yet to be released. For their part, the Conservative caucus launched a consultation process on May 6th on rural internet access with a report entitled Connect Canada. Their report calls for all Canadians to be connected by the end of 2021 and includes 14 recommendations to help achieve this goal. They will be consulting with Canadians on this important topic.

Next Steps/Recommendations

Based on the findings from this report, below are recommendations for next steps KAP could take to advance efforts on the rural connectivity file.

1) **Partner with other stakeholders:** Rural connectivity is an issue that impacts many, not just farmers. KAP should partner with other interested stakeholders, such as the Association of Manitoba Municipalities and the Manitoba Chambers of Commerce, to bring forward a strong and united message. KAP could also look at expanding partnerships beyond Manitoba and work with counterparts in other provinces, such as the Agricultural Producers Association of

[10] United States Department of Agriculture, A Case for Rural Broadband: Insights on Rural Broadband Infrastructure and Next Generation Precision Agriculture Technologies, April 2019, available at https://www.usda.gov/sites/default/files/documents/case-for-rural-broadband.pdf

Saskatchewan and the Saskatchewan Association of Rural Municipalities, both of whom have been involved in lobbying for improved rural connectivity recently.

2) **Engage with the Government of Manitoba**: As mentioned earlier, the Government of Manitoba does not have a strategy, nor has it invested recently to improve connectivity in Manitoba. Seeing as Manitoba is lagging in terms of connectivity compared to many other provinces and the PCs committed to developing a broadband strategy during the election, a recommendation would be to engage with the provincial government to encourage them to prioritize and commit resources to addressing the rural connectivity issue.

3) **Participate in the Conservatives' Connect Canada consultation process:** This represents another avenue to communicate to the federal government the impacts of inadequate rural connectivity.

4) **Create a database of internet speeds**: One of the concerns highlighted in this report is the potential discrepancy between speeds users are experiencing versus speeds that are being reported by ISED and the CRTC. KAP could start a campaign to have its members test their internet speeds which would provide the Government of Canada with accurate data. Additionally, KAP could request that members send the speed test results to KAP to create a database to monitor progress independently.