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Report Overview

Manitoba and a Digital-First Future:
*The Implications of Connectivity
on Tech-Equity and Education*



Study Scope

This study explores the “digital divide” between urban regions with high-level broadband access and rural and remote regions with poor or no access. It discusses the implications of this disparity for K-12 education equity specific to Manitoba, which has among the slowest broadband speeds in the country.

This study also provides a snapshot of broadband connectivity in Canada, Canada’s official broadband aspirations, and the initiatives to digitize rural and northern communities.

It also offers six international case studies that could serve as guides to best practices for addressing digital gaps and improving digital education in Manitoba.

Study Context

“A lack of digital access is a lack of access to education, period.”

Terry Godwaldt, Director of Programming, The Center for Global Education, Canada

Access to reliable, affordable, high-speed broadband internet services is becoming vital for the economic and social welfare; however, several Canadian rural, remote, and low-income areas still receive inadequate or no internet services.

COVID-19 lockdowns accentuated the “digital divide.” Regions with poor connectivity have compromised access to education, healthcare, employment, and social and economic opportunities.

Research confirms that connectivity correlates with economic opportunities. A study of internet adoption in France between 2009 and 2013 found broadband adoption contributed to a 34% increase in average household income and an 80% reduction in income inequality, as measured by the Gini Index.

The Impact of COVID-19 on Digital Equity

More families began to work and educate from home in the COVID Era, driving a significant rise in bandwidth consumption over residential networks, which can result in reduced service quality and potential overage charges, which can disproportionately affect rural, remote, and low-income households.

Key Terms

Bandwidth: The maximum capacity of an internet connection (differs from the actual speed at any given moment)

Download Speed: Speed in megabits per second (Mbps) of data that can be pulled from a server to a local computer. Most systems are designed for higher download speeds than upload speeds because more online activity requires receiving data from servers than sending data to servers

Upload Speed: Speed that data can be sent from the local computer to a server

Current State of Connectivity in Canada

In 2018, 94% of Canadians had access to the internet at home:

- 88% of users reported accessing the internet on a smartphone
- 53% of users had an internet-connected smart home device
- 23% of users conducted some telework from home

In 2019 and 2020, the median download speed in Canada increased by 46%

- Ranging from 51.95 Mbps in Ontario to 5.64 Mbps in Newfoundland

Median upload speed increased from 5.79 Mbps to 8.16 Mbps

- Ontario, British Columbia, and New Brunswick had the highest upload speeds

Connectivity in Manitoba

Broadband speeds in Manitoba are among the slowest in Canada. Online speed testing conducted in 2019 found that the average fixed download speed is one of the slowest in the country, only ahead of Saskatchewan and the Territories.

Canada's Official Connectivity Objectives

In December 2016, the Canadian Radio-Television and Telecommunications Commission (CRTC) declared high-speed internet access to be a "basic telecom service" in Canada.

- It includes "unlimited data options" for urban and rural customers
- CRTC targets download speeds of at least 50 Mbps and upload speeds of 10Mbps
- Currently, 85.7% of Canadian households have this "50/10 Mbps" internet access
 - However, only 40.8% of rural communities have 50/10 Mbps access

These internet speed targets are slightly more ambitious than similar targets in the US, Australia, and most of Europe.

Beyond the Rural/Urban Digital Divide

First Nations Communities

Only 31% of First Nations reserves have access to internet services at 50/10 Mbps speeds, and is slightly less for First Nations in Manitoba (recent CRTC data).

Low-Income Areas

The “digital divide” is also apparent within urban areas. Average internet speeds can vary by neighbourhood, due to variations in infrastructure:

- In the Greater Toronto and Hamilton Area (GTHA is Canada’s most populous metropolitan area), older, lower-income neighbourhoods can still have average download speeds under 10 Mbps
- Even some higher-income GTHA suburbs have speeds of less than half of CRTC’s 50 Mbps target

Internet Affordability

- Only 69% of Canadians in the lowest income quintile (<\$33,000/yr) had internet access at home, compared to 94.5% in the highest quintile (>\$132,909/yr): CRTC 2017 data
- Low-income Canadians spend 9.1% of their income on communication services such as mobile, internet, landline telephone, and television
- Canadians spend an average of \$233 per month on these services (\$155 of which is mobile and internet services)

Broadband Access: Trends, Education, Equity

Digital Trends in the Classroom

Approximately one in three Canadian students use the internet for school each day.

- COVID-19 has accelerated digital education, which can pose challenges for rural areas
- Most K-12 educators use some technology in the classroom requiring internet connectivity
- COVID-19 requires educators to improve their knowledge of digital tools and resources
- COVID-19 adversely impacts education in households with poor or no internet connectivity

Initiatives to Overcome the Digital Divide

Infrastructure

Numerous government, community, and industry initiatives are in play to close the digital divide. The following is a sampling of these:

- The Universal Broadband Fund will deliver up to \$6 billion in investments in rural broadband projects over the next decade as part of the federal government's High-Speed Access for All: Canada's Connectivity Strategy
- In 2017, the Canada Infrastructure Bank invested \$1 billion in loans, equity, and loan guarantees to leverage \$2 billion in private investments in digital infrastructure
- Government of Canada allocated \$2 billion for infrastructure projects, including broadband and telecommunications in northern and rural communities, as part of its Investing in Canada Plan in 2017 (included a First Nations Infrastructure fund to address infrastructure gaps on reserves)
- CRTC has established a \$750 million Broadband Fund that, over five years, will finance investments to improve internet access in remote areas
- From 2016-2018, Government of Canada provided \$585 million to provide an infrastructure backbone in rural and remote communities
- Connecting Canadians (initiated in 2015) earmarked \$500 million to help provide high-speed internet to households in rural and remote communities

Hardware/Software/Various Programs

- Connecting Families Program (started in 2017) aims to invest \$13.2 million for 50,000 computers for households that earn less than \$30,000 a year and have limited or no access to computers
- Manitoba Education offers online and face-to-face learning opportunities that respect individual cultural and community needs
- In 2014, Manitoba Education's "Bring Your Own Device" policy allowed students to use their own personal laptops, smartphones, and tablets for educational applications

Technologies for Digitizing Rural and Northern Communities

Various solutions are being implemented to improve broadband access and connectivity in rural and remote communities across Canada, including the following:

- The use of idle bands of television spectrum
- Launching satellites in low-Earth orbit
- Laying fiber-optic cable

Research and Education Networks

Effective digital education in Manitoba and Canada is supported by the following groups:

- Canada's National Research and Education Network (NREN), which bolsters Canadian leadership in research, education, and innovation
- CANARIE, a federal partner in NREN, connecting Canadian institutions with research, education, and innovations
- Manitoba's Regional Advanced Research and Education Network (MRnet), the province's contributor to Canada's NREN, connecting researchers and educators in Manitoba to global research and education networks
- Manitoba Education, Research and Learning Information Networks (MERLIN), providing access to CANARIE and MRnet, offering gateway internet services to educational institutions

Case Studies in Broadband Policy

Manitoba's challenges are not unique. Other countries have expansive geography, sparse populations, and systemically disadvantaged communities.

The **full report** discusses how Australia; Arizona, USA, Lithuania, Slovenia and Croatia, and New Zealand is leveraging various funding models and technologies to connect their citizens to the digital age.