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DEPLOYMENT OF BROADBAND INTERNET IN RURAL AND REMOTE AREAS OF CANADA

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*Deployment of Broadband Internet
in Rural and Remote Areas of Canada*
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EXECUTIVE SUMMARY

High-speed (or broadband) Internet has become integral to the lives of most Canadians. Broadband Internet service is all the more important in rural and remote areas, because it makes it possible to provide various essential services to the people who live in these areas, such as education and medical care, to which they often would not have access otherwise.

Even though the Government of Canada has undertaken multiple initiatives, connectivity across the country remains unequal; Canadians in urban areas have access to a wide variety of Internet services, while those living in rural and remote communities still have limited or no access to broadband service. One reason for this inequality is the extremely high cost of building broadband networks, particularly in more isolated areas. This HillStudy provides an overview of the issues with broadband Internet access in rural and remote areas of Canada and the initiatives taken in response to these issues.

DEPLOYMENT OF BROADBAND INTERNET IN RURAL AND REMOTE AREAS OF CANADA *

1 INTRODUCTION

High-speed (or broadband)¹ Internet has become an integral part of the lives of many Canadians. Moreover, governments at all levels offer an increasing number of services online. Access to broadband Internet is even more important in rural and remote areas, because it makes various essential services, like education and medical care, available to the people who live there and who often would have no access to them otherwise.

Given that Canada's population is unevenly distributed over a vast landscape – most Canadians live in communities along the border with the United States – connectivity across the country remains unequal. Canadians who live in urban areas have access to a wide variety of Internet services, while those living in rural and remote areas continue to have limited or no access to broadband Internet, mainly because of the extremely high cost per capita of building broadband networks. Their cost-effectiveness is highly dependent on the population density of the market. This gap in connectivity between urban and rural areas, often referred to as the “digital divide,” is a concern for policy-makers at all levels of government.

2 OVERVIEW

In December 2016, the Canadian Radio-television and Telecommunications Commission (CRTC) declared that broadband Internet access is a basic telecommunication service for all Canadians, and it set the following targets for the basic service Canadians need to participate in the digital economy:

- a download speed of 50 megabits per second (Mbps) and an upload speed of 10 Mbps (speeds of 50/10 Mbps) for fixed broadband Internet service;
- the option of an unlimited data package for fixed broadband Internet service; and
- access to the latest mobile wireless technology (long-term evolution or LTE) not only in all homes and all businesses, but also along Canadian highways and major roads.²

In 2019, the Government of Canada launched *High-Speed Access for All: Canada's Connectivity Strategy* in which it stated that 84% of Canadian households had access to speeds of 50/10 Mbps and pledged to bring these speeds to 90% of Canadian households in 2021, 95% in 2026 and 100% in 2030.³ Data from June 2023 showed that 91.4% of Canadian households had access to a broadband Internet connection, which meets the CRTC target, but only 62% of households in rural regions had the same access. In terms of access to LTE mobile technology, 99.4% of Canadians have coverage. More specifically, 97.1% of individuals who live in rural areas have access to LTE, as do 87.2% of those who live along highways and major roads.⁴

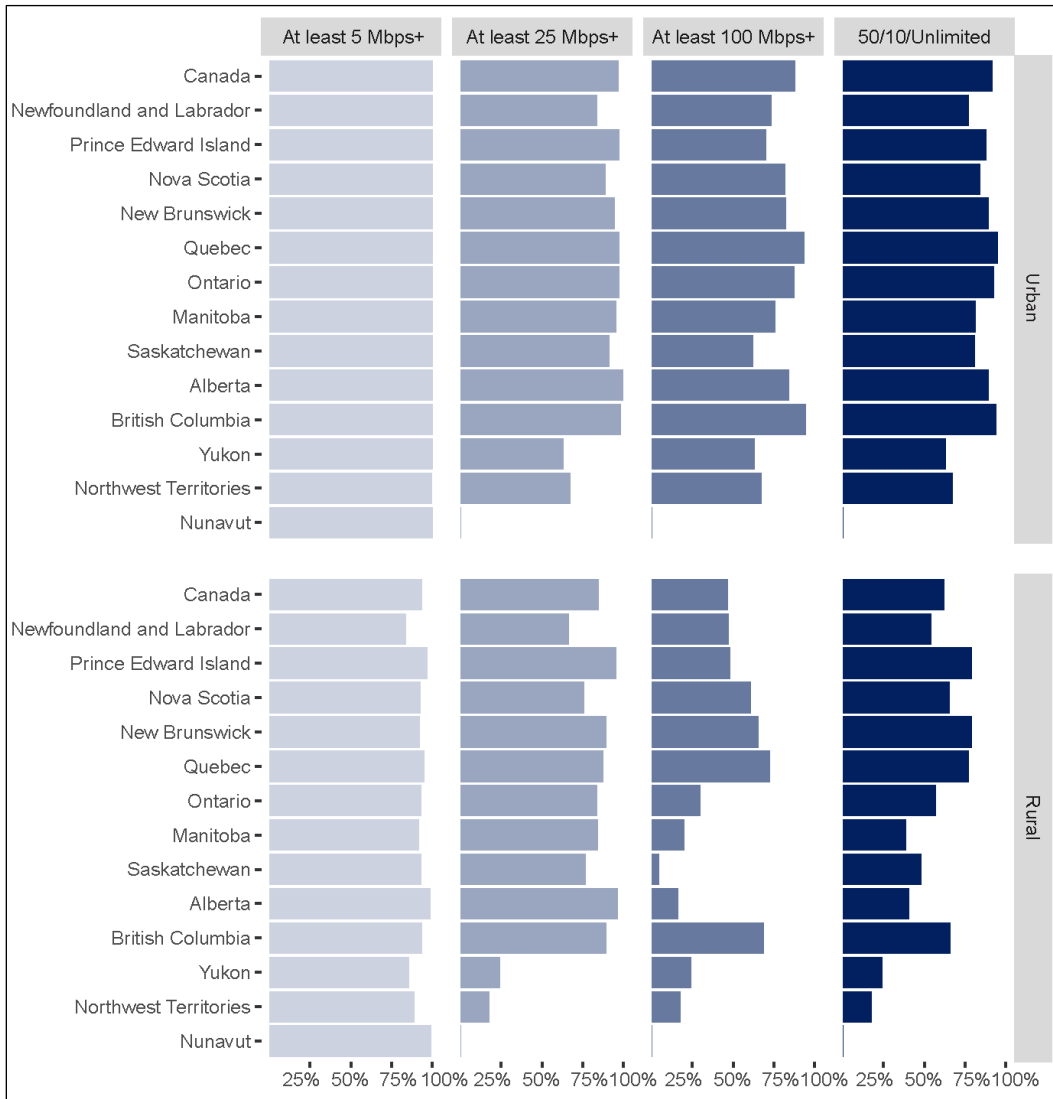
3 DIGITAL DIVIDE

A digital divide separates those who have access to broadband Internet from those who do not. There are two main types of digital divide: technical and socio-economic. The technical digital divide refers to the accessibility or technical capacity for high-speed connectivity. Although there may be areas in cities (or on the outskirts of cities) without broadband Internet access, the technical digital divide generally refers to the gap between urban and rural or remote areas.

The socio-economic digital divide relates to choice and barriers to access; in fact, those who have access to broadband Internet services may not subscribe to them. The barriers to access that cause this type of divide can be related to age, income, education, language, gender or other identity factors. They can also depend on digital literacy. It is important to bridge the socio-economic digital divide in order to establish a digital society that leaves no one behind. This study, however, addresses the fundamental problem of technical access to broadband service.

Figure 1 illustrates the broadband availability gap between urban and rural areas in Canada and the progress made in provinces and territories to meet the CRTC target of 50/10/unlimited data.

Figure 1 – Availability of Broadband Service in Urban and Rural Areas of Canada, by Province and Territory, by Download Speed and Percentage of Households, 2021



Source: Figure prepared by the Library of Parliament using data obtained from Canadian Radio-television and Telecommunications Commission, [“Current trends – High-speed broadband,”](#) *Communications Market Reports*.

While very little disaggregated data on broadband Internet access in Indigenous communities exist, there are often major differences between broadband Internet access in Indigenous communities (located in urban, rural and remote areas) and in non-Indigenous communities. The Library of Parliament has prepared a HillNote on this topic.⁵

4 CANADIAN DEMOGRAPHICS AND ACCESS TO BROADBAND SERVICE

Canada is a vast and sparsely populated country with dramatically varying landscapes and climates. Its population density is 3.9 persons per square kilometre (persons/km²). For comparison, Table 1 provides data on population density and urbanization in selected countries.

**Table 1 – Population Densities and Urbanization
(Selected Countries)**

Country	Area (km ²)	Population (millions)	Density (persons/km ²)	Urbanization (%)
Australia	7,741,220	26.5	3.4	86.6
Belgium	30,528	11.9	389.8	98.2
Canada	9,984,670	38.5	3.9	81.9
Finland	338,145	5.6	16.6	85.8
France	643,801	68.5	106.4	81.8
Hong Kong	1,108	7.3	6,588.4	100
Japan	377,915	123.7	327.3	92
Singapore	719	6.0	8,344.9	100
South Korea	99,720	52.0	521.5	81.5
United Kingdom	243,610	68.1	279.5	84.6
United States	9,833,517	339.7	34.5	83.3

Source: Table prepared by the Library of Parliament using data obtained from Central Intelligence Agency, “[The World Factbook](#),” Database. Population data is a July 2023 estimate; urbanization data is the percentage of the total population living in urban areas, as defined by the country, in 2023. Density is calculated using data from The World Factbook.

Canada’s population distribution and geography are sometimes referenced as a reason for which Canadians receive lower-quality broadband Internet service, but pay higher prices than citizens of other developed countries. For example, Innovation, Science and Economic Development Canada (ISED) explained in its introduction of the Connect to Innovate program that in rural and remote communities, “[c]hallenging geography and smaller populations present barriers to private sector investment in building, operating and maintaining infrastructure.”⁶

While Canada’s population density is very low compared to other countries, this overall average can be misleading, because population density is not constant across the country, and the average represents neither the high density of urban areas nor the very low density in rural and remote areas. Comparing the North (Yukon, the Northwest Territories and Nunavut) with Canada’s five largest census metropolitan areas (CMAs) (Toronto, Montréal, Vancouver, Calgary and Ottawa–Gatineau) shows how a measure based on total population and total land area can be misleading. In 2021, the North represented 39% of Canada’s land mass and only 0.3% of

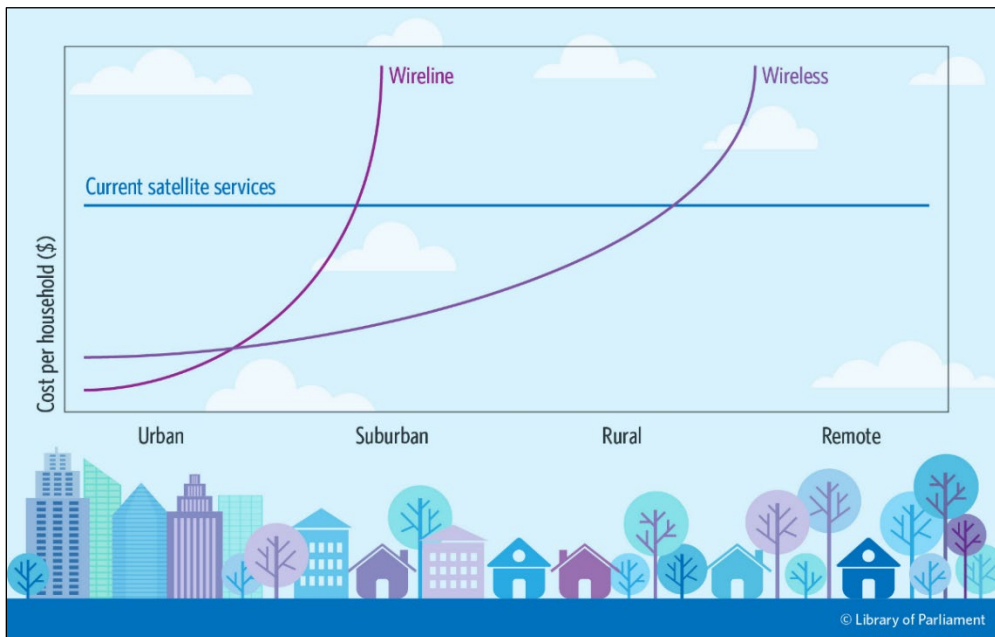
its population, for a population density of 0.013 persons/km². The five largest CMAs comprised 0.3% of the country's land mass, but 43.5% of the population, for a population density of 605.6 persons/km².⁷

Moreover, ISED has, for several years now, commissioned an annual study that compares prices between wireline, wireless and Internet services in Canada and abroad. The latest study was conducted in 2022. It shows that the average price of broadband Internet service in Canada is higher than in all countries surveyed except Japan, including countries like Australia with a similar population density. Canadian prices for these services, however, are higher than or similar to Japan's for connection speeds greater than 40 Mbps.⁸ Thus, although Canadian demographics explain in part the high cost and difficulty of deploying broadband Internet service in rural and remote areas, they do not fully explain the situation. Several stakeholders have often pointed to the lack of competition in telecommunications services in Canada, particularly in rural and remote regions, as another partial explanation.⁹

5 CURRENT TECHNOLOGY

The cost-effectiveness of various broadband Internet delivery systems depends largely on the population density in the targeted regions. Figure 2 shows how declining population density leads to higher capital costs for Canadian households with wireless or wireline broadband Internet (wire or fibre). On the contrary, costs do not rise the same way for satellite services because of their vast coverage, but their technical features make them an option for sparsely populated areas only.

Figure 2 – Cost-Effectiveness of Broadband Delivery Systems by Population Density



Source: Figure prepared by the Library of Parliament using data obtained from Brightstar Canada, [Nova Scotia Department of Business Last Mile Strategy](#), May 2018.

In 2021, nearly one million Canadian households depended on fixed wireless and satellite technologies for their Internet connection:

- Fixed wireless systems use digital radio transmitters placed in elevated locations (e.g., rooftop or tower) and achieve point-to-point signal transmission using a microwave platform.¹⁰
- Satellite broadband service provides access to multiple remote users from one delivery point. Satellite service is costly compared to other technologies and generally offers lower speeds. Often, satellite service has greater latency. However, emerging low earth orbit (LEO) satellites, already deployed in some parts of Canada, give users in rural and remote areas access to faster, better-quality Internet service. More than 60 communities in Canada still depend on satellite for Internet connectivity.¹¹

Some view these technologies as a short-term connectivity solution for use while the government and industry work toward long-term solutions (for example, extending fibre optic networks to rural and remote areas).¹² Others believe that wireless service will always be needed in certain remote communities.¹³

Given that wireless technologies are particularly important for deploying broadband Internet in rural and remote areas, it is imperative that access to radiofrequency spectrum licences be considered. To provide more information about the spectrum management process in Canada, the Library of Parliament has prepared both a HillNote and a working paper on the subject.¹⁴

6 GOVERNMENT SUPPORT

ISED and the CRTC are responsible for different aspects of telecommunications services in Canada. While they have separate roles, they also work together on many levels, as they do with funding programs for broadband Internet deployment.

In recent years, the Government of Canada has introduced various programs and initiatives to improve broadband Internet coverage in Canada and meet the targets set by the CRTC. The Government of Canada reports that it has invested over \$7.6 billion in connectivity since 2015.¹⁵ For example:

- In 2016, the CRTC created a \$750-million fund using contributions from large telecommunications service providers to support projects in areas where targets have not been met. From the time of its launch to August 2022, the Broadband Fund committed \$226.5 million for improving fixed and mobile wireless broadband Internet service in 205 communities across Canada. In November 2022, the CRTC made a third call for applications to the Fund.¹⁶

- From 2016 to 2023, the Connect to Innovate program targeted investments of up to \$585 million to bring broadband Internet to 975 rural and remote communities.¹⁷ By December 2022, the program had connected 928 communities. More details about the communities served through the program are available on the program’s web page.¹⁸
- In Budget 2018, the federal government announced funding of \$100 million over five years for the Strategic Innovation Fund to support LEO satellite projects and the delivery of next-generation rural broadband service.¹⁹
- In June 2018, ISED launched a review of the legislation that governs telecommunications and broadcasting.²⁰ The public consultations held as part of this review helped to identify key recurring issues, including “broadband deployment in rural and remote communities.” In January 2020, the Broadcasting and Telecommunications Legislative Review Panel submitted its final report, *Canada’s communications future: Time to act*.²¹
- In Budget 2019, the government proposed two measures:
 - the Universal Broadband Fund: up to \$1.7 billion over 13 years, starting in 2019–2020, to establish a national broadband Internet program. This funding seeks to build on initiatives carried out under the Connect to Innovate program and to increase the capacity of LEO satellites; and
 - targeted surveys by Statistics Canada: up to \$11.5 million over five years, starting in 2019–2020, for two surveys to measure household access to and use of the Internet, and to gauge the online conduct of businesses.²²
- In June 2019, ISED launched its economic development strategy for rural Canada, which includes a section on rolling out broadband Internet, with a special focus on reducing the administrative burden, improving data collection and making additional spectrum available.²³
- In July 2019, ISED announced an \$85-million investment in Canadian satellite company Telesat to develop and test new technologies for its LEO satellites. ISED also announced an investment of up to \$600 million over 10 years so that the new constellation of satellites can provide access to Internet everywhere in Canada.²⁴

Moreover, as part of the Universal Broadband Fund, the Canada Infrastructure Bank (CIB) is collaborating with ISED to support the implementation of large and small broadband Internet projects proposed by Internet service providers across Canada. To achieve this, the CIB has pledged up to \$3 billion, alongside contributions from ISED, in debt or equity investments.²⁵

In 2018, the Office of the Auditor General of Canada (OAG) published a first audit report on connectivity in some rural and remote areas, in which the OAG noted Canada's need to establish a national strategy to improve connectivity in rural and remote areas.²⁶ In spring 2023, the OAG published a second report on this topic which found that, although connectivity in the country improved through government initiatives, the digital divide persists, particularly for Canadians living on First Nations reserves and in rural and remote areas. The OAG noted that neither ISED nor the CRTC have the data needed to get a full understanding of the quality and affordability of the Internet services available across the country.²⁷

7 CONCLUSION

If we are to have a truly inclusive digital society, all Canadians must have access to broadband Internet service. Accordingly, the Canadian government has put in place a strategy with a goal of achieving the CRTC targets for broadband Internet for all Canadians by 2030. The government will then be able to take measures to bridge the socio-economic digital divide to allow all Canadians – not only those living in urban areas – to benefit fully from our 21st-century digital society.

NOTES

- * This HillStudy is largely based on Sarah Lemelin-Bellerose, Dillan Theckedath and Terrence J. Thomas, *Rural Broadband Deployment*, Publication no. 2011-57-E, Library of Parliament, 17 July 2019.
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