Conquering the Next Frontier in Bridging the Digital Divide

Ian Scott

IN BRIEF

Having reliable access to the internet is a fundamental part of everyday life — but not for everyone. Indigenous and northern communities are behind the rest of Canada in being able to access the internet at speeds needed to take advantage of essential online services, such as health care, education, banking and employment. Low-income Canadians struggle to afford the technology and internet plans needed to access these services. To close these gaps, this paper identifies new approaches governments can take to address the needs of underserved communities and improve the affordability of the internet for low-income Canadians.

EN BREF

Disposer d'un accès Internet fiable est un aspect essentiel de la vie quotidienne, mais ce n'est pas le cas pour tout le monde. Les communautés autochtones et nordiques sont en retard par rapport au reste du Canada en ce qui concerne l'accès à Internet aux vitesses nécessaires pour profiter des services en ligne essentiels, tels que les soins de santé, l'éducation, les services bancaires et l'emploi. Les Canadiens à faible revenu ont du mal à s'offrir la technologie et les forfaits Internet nécessaires pour accéder à ces services. Pour combler ces lacunes, cette étude identifie de nouvelles approches que les gouvernements peuvent adopter pour répondre aux besoins des communautés mal desservies et améliorer l'accessibilité financière d'Internet pour les Canadiens à faible revenu.

ABOUT THIS PAPER

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To cite this document:
Scott, I. (2024). *Conquering the Next Frontier in Bridging the Digital Divide*. IRPP Insight No. 54. Montreal: Institute for Research on Public Policy.

CONTENTS

HIGHLIGHTS

Having reliable access to the internet is a fundamental part of everyday life — but not for everyone.

The Canadian Radio-television and Telecommunications Commission, an administrative tribunal that regulates and supervises broadcasting and telecommunications, declared in 2016 that broadband internet with download speeds of at least 50 megabits per second and upload speeds of at least 10 megabits per second was a basic telecom service. And the federal government has set a goal of connecting 98 per cent of Canadians to high-speed internet by 2026 and 100 per cent by 2030, a goal it is on target to meet.

Despite significant public and private investment, glaring gaps in service remain. Indigenous and northern communities are woefully behind the rest of Canada in being able to access the internet at speeds needed to take advantage of essential online services such as health care, education, banking and employment. Only half of households in First Nations communities and 58 per cent of households in northern Canada meet the basic service target.

These challenges are not limited to rural and remote areas. Low-income Canadians, regardless of where they live, struggle to afford the technology and internet plans needed to take full advantage of the digital economy.

This paper argues that, to close these gaps, governments should pursue new approaches that address the needs of underserved communities and improve the affordability of the internet, including the following:

- **Improve co-ordination within and across governments** — Improved co-ordination between the federal and provincial and territorial governments could help overcome the CRTC's lack of direct jurisdiction over some types of infrastructure, including municipal facilities and utility poles, that are necessary to expand broadband infrastructure. There should also be improved co-ordination among federal government departments in developing more effective relationships with Indigenous communities and exploring the potential for more Indigenous-owned fibre assets, and in working together to improve affordability of broadband service for low-income households.
- **Prioritize northern and Indigenous communities** — Indigenous and northern communities have the lowest level of high-speed internet access. Internet service in the territories is provided by a small number of firms in challenging conditions. Improving access to these areas will require government involvement, either through subsidies or capital investment. New satellite technology could hold promise.
- **Expand discounted internet plans** — Existing government and private-sector efforts to improve affordability of high-speed broadband services are making progress but there is more to do. The federal government should commit to providing the necessary funding to expand existing support programs, possibly

from the proceeds of spectrum auctions. Innovation, Science and Economic Development Canada and Employment and Social Development Canada should jointly develop an easy-to-use program to defray internet costs for low-income households.

Canada prides itself on its superior social safety net, but still has not found a solution to address the affordability and adoption challenges of providing access to high-speed broadband internet to low-income households and northern and Indigenous communities. These should be the key priorities of the government's future efforts to conquer the next frontier of the digital divide.

FAITS SAILLANTS

Disposer d'un accès Internet fiable est un élément fondamental de la vie quotidienne, mais tout le monde n'y a pas accès.

Le Conseil de la radiodiffusion et des télécommunications canadiennes (CRTC), un tribunal administratif qui réglemente et supervise la radiodiffusion et les télécommunications, a déclaré en 2016 qu'Internet à haut débit avec des vitesses de téléchargement d'au moins 50 mégabits par seconde et des vitesses de téléversement d'au moins 10 mégabits par seconde était un service de télécommunications de base. Le gouvernement fédéral s'est fixé pour objectif de connecter 98 % des Canadiens à Internet haute vitesse d'ici 2026 et 100 % d'ici 2030, un objectif qu'il est en passe d'atteindre.

Malgré d'importants investissements publics et privés, des lacunes flagrantes subsistent dans les services. Les communautés autochtones et nordiques sont terriblement en retard par rapport au reste du Canada en ce qui concerne l'accès Internet aux vitesses nécessaires pour profiter des services en ligne essentiels tels que les soins de santé, l'éducation, les services bancaires et l'emploi. Seulement la moitié des ménages des communautés des Premières Nations et 58 % des ménages du Nord du Canada atteignent l'objectif de service de base.

Ces défis ne se limitent pas aux zones rurales et éloignées. Les Canadiens à faible revenu, quel que soit leur lieu de résidence, ont du mal à s'offrir la technologie et les forfaits Internet nécessaires pour tirer pleinement parti de l'économie numérique.

Cette étude avance que, pour combler ces lacunes, les gouvernements devraient adopter de nouvelles approches qui répondent aux besoins des communautés mal desservies et améliorent l'abordabilité d'Internet, y compris les suivantes :

- **Améliorer la coordination au sein des gouvernements et entre eux** – Une meilleure coordination entre les gouvernements fédéral, provinciaux et territoriaux pourrait aider à surmonter l'absence de compétence directe du CRTC sur certains types d'infrastructures, notamment les installations municipales et les poteaux électriques, qui sont nécessaires à l'extension de l'infrastructure à large bande. Il faudrait également une meilleure coordination entre les ministères fédéraux pour développer des relations plus efficaces avec les communautés autochtones et explorer le potentiel d'un plus grand nombre d'actifs de fibre optique appartenant aux Autochtones, et pour travailler ensemble afin d'améliorer l'accessibilité des services à large bande pour les ménages à faible revenu.
- **Donner la priorité aux communautés autochtones et du Nord** – Elles sont celles qui ont le moins accès à Internet haute vitesse. Dans les territoires, le service Internet est fourni par un petit nombre d'entreprises privées dans des conditions difficiles. L'amélioration de l'accès à ces zones nécessitera l'intervention des pouvoirs publics, sous la forme de subventions ou d'investissements en capital. La nouvelle technologie satellitaire pourrait s'avérer prometteuse.

- **Élargir les forfaits Internet à prix réduit** – Les efforts gouvernementaux et privés pour améliorer l'abordabilité des services haute vitesse progressent, mais il reste encore beaucoup à faire. Le gouvernement fédéral devrait s'engager à fournir le financement nécessaire pour étendre les programmes de soutien existants, éventuellement à partir du produit des enchères de licences de spectre. Innovation, Sciences et Développement économique Canada et Emploi et Développement social Canada devraient développer conjointement un programme facile à utiliser pour prendre en charge les coûts d'Internet pour les ménages à faible revenu.

Le Canada s'enorgueillit de son filet de sécurité sociale développé, mais il n'a toujours pas trouvé de solution pour relever les défis de l'abordabilité et de l'adoption de l'accès à Internet haute vitesse pour les ménages à faibles revenus et les communautés nordiques et autochtones. Telles devraient être les principales priorités des efforts futurs du gouvernement pour franchir la prochaine frontière numérique.

INTRODUCTION

Consider for a moment the many benefits of connecting to the internet. It serves as a vast repository of information, enabling instant access to knowledge on virtually any subject and is revolutionizing education, research and learning. The internet also facilitates global communications, connecting people anywhere and everywhere in real time. This connectivity enhances social interaction, both personal and professional, and is pivotal for businesses, both large and small. Finally, the internet has become a cornerstone for news and entertainment, offering streaming audio and audiovisual services, social media and gaming. In short, the internet has become a fundamental component of everyday life — but not for everyone. Many Canadians remain disconnected.

Governments at all levels are increasingly focused on ensuring broad access to the internet. In Canada, the first principle of the *Digital Charter Implementation Act* (Bill C-27), tabled by the federal government in 2022, proposes that "all Canadians will have equal opportunity to participate in the digital world and the necessary tools to do so, including access, connectivity, literacy and skills" (Innovation, Science and Economic Development Canada, n.d.-a).

The concept of internet access as a basic need is not new. In 2016, the Canadian Radio-television and Telecommunications Commission (CRTC), which supervises and regulates broadcasting and telecommunications, declared broadband internet with download speeds of at least 50 megabits per second (Mbps) and upload speeds of at least 10 Mbps to be a basic telecom service. In the same decision, the CRTC announced a $750-million broadband fund to further the rollout of high-speed internet in underserved regions (CRTC, 2016).

Fast forward to 2020, in the midst of the global COVID-19 pandemic, when Prime Minister Justin Trudeau announced an investment of an additional $1.75 billion to help connect Canadians across the country (Prime Minister of Canada, 2020). The Universal Broadband Fund, also launched in 2020, provides $3.23 billion to bring internet at speeds of 50/10 (download/upload) Mbps to rural and remote communities (Innovation, Science and Economic Development Canada, n.d.-b). Combined with previous funding for various broadband programs dating back to 2015, more than $7.6 billion has been allocated to improving connectivity with a goal of connecting 98 per cent of Canadians to high-speed internet by 2026 and 100 per cent by 2030 (Innovation, Science and Economic Development Canada, 2022a). The government of Canada has also entered into co-funding partnerships with Quebec, Ontario, Newfoundland and Labrador, Alberta, British Columbia and Prince Edward Island, adding nearly $2 billion in provincial co-funding to help meet national connectivity targets faster.

With broadband coverage on target to connect 100 per cent of Canadians to high-speed internet by 2030, some may mistakenly believe that Canada is close to claiming success in bridging the digital divide.[1] There remain, however, some glaring gaps.

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[1] The origin of the term "digital divide" is most often traced back to a series of reports published by the U.S. National Telecommunications and Information Administration (1995).

Indigenous and northern communities remain woefully behind the rest of Canada in terms of the availability of internet at speeds needed to take full advantage of essential services such as health care and education. Only half of households in First Nations communities and 58 per cent of households in northern Canada meet the basic service target (CRTC, n.d.).

A lack of connectivity impacts access to government services and information, banking, health care, education and employment. Telehealth services enable patients to consult with doctors and nurse practitioners without travelling long distances, thus improving badly needed health care access. Similarly, online education platforms support students and educators in isolated areas. Without adequate connectivity, Canadians living in these regions lack access to these essential services.

A lack of connectivity also impacts opportunities for economic growth and prosperity. Substandard access limits e-commerce, denying local entrepreneurs the opportunity to reach national and global markets. It also limits remote work that provides job opportunities and reduces the need to relocate.

These challenges are not limited to rural and remote areas. Regardless of location, low-income Canadians struggle to afford the technology and internet plans needed to take full advantage of the digital economy.

The COVID-19 pandemic aptly illustrated our dependence on the digital economy: many people relied on internet access to work, shop, connect with friends and family, and receive health information and services. Those who were not connected were simply left behind.

To overcome these gaps, governments should pursue new approaches that address the needs of underserved communities and improve the affordability of the internet. This paper explores both issues and provides recommendations to conquer the next frontier in bridging the digital divide.

AVAILABILITY OF BROADBAND INTERNET

It has been eight years since the CRTC declared broadband to be a basic service objective, established an aspirational broadband speed and allocated more than $8 billion in infrastructure investment. That aspirational broadband speed is entrenched in current government policy and often subjected to negative commentary for being out of date. Internet speeds are typically defined in terms of megabits per second (Mbps) for downloading and uploading data. Download speed is the speed at which data, including files, websites, pictures, music and movies, is delivered from the internet to a user. Upload speed is the speed at which data is travelling to the internet. Upload speeds are typically much lower than download speeds; as a rule of thumb, usually around 20 per cent of the download speed.

In either case, the bigger the number, the better the performance. At the same time, the number of users and devices has a major impact. Table 1 illustrates typical broadband

speeds for various online activities. Put simply, lower broadband speeds and lots of devices will result in slower connections to the internet.[2]

The CRTC's original target speed of 50 Mbps downstream remains relevant because it can easily support typical household use, for example, simultaneously supporting email and browsing, music streaming and video calls. But with the advent of high definition and 4K video streaming and 4K gaming, the demand for much higher speeds continues to grow.

Table 1. Typical download speed required per activity

Online activity	Speed
Emails and web surfing	0.5 to 1 Mbps
Music streaming	1 to 2 Mbps
SD video streaming	2 to 3 Mbps
Video calls and gaming	3 to 5 Mbps
HD video streaming	5 to 25 Mbps
4K video streaming and gaming	25 to 50 Mbps

Source: Rogers, retrieved May 2024 from https://www.rogers.com/support/internet/how-much-speed-do-i-need-for-different-online-activities

The good news is that broadband access for all speeds (in particular, faster speeds such as gigabit access, or 1,000 Mbps) continues to improve across the country as billions of dollars are being distributed from various federal, provincial and territorial funds to successful applicants, helping to leverage billions of additional dollars in private investment.

As depicted in figure 1, there has been steady growth in the share of Canadian households and businesses that have access to internet service with speeds of 50/10 (download/upload) and unlimited data transfer, which sits at just over 93 per cent (CRTC, n.d.). At an aggregate level, it appears that Canada is on target to achieve federal goals of connecting 98 per cent of all Canadians to high-speed internet by 2026 and 100 per cent by 2030 (Innovation, Science and Economic Development Canada, 2022a).

The industry, too, has been doing its part, committing significant resources to the geographic expansion of both fixed and wireless broadband. Capital expenditure on broadband (both fixed and mobile) have totalled many billions of dollars since 2017, a significant part of which has gone to support the deployment of fibre to the home, which provides gigabit speed services. In 2020, capital expenditures reached $10 billion, or roughly $260 per Canadian (Statistics Canada, n.d.-a). Today, around 83 per cent of Canadian homes have access to gigabit or higher services (CRTC, n.d.). By the end of 2022, 60 per cent of Canadian homes reached by the large telephone companies had access to fibre networks (CRTC, 2023a).[3]

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[2] An additional factor impacting the quality of an internet connection is latency, which is the time it takes for data to be transferred between its original source and its destination, measured in milliseconds. Internet latency and network latency affect satellite internet connections, cable internet connections and some Wi-Fi connections.

[3] Migration to higher-speed internet packages evolved during the pandemic. The proportion of residential subscriptions to services offering speeds of 100 Mbps or faster grew from 47.8 per cent in 2020 to 52.7 per cent in 2021. In 2021, 11.8 per cent of subscriptions were for services offering speeds of at least a gigabit, compared to 8.3 per cent in 2020. See CRTC (n.d.).

Figure 1. Access to high-speed internet among Canadian households is rising
Share of households and businesses that have access to internet service with speeds of 50/10 and unlimited data transfer, 2016 to Q2 2022
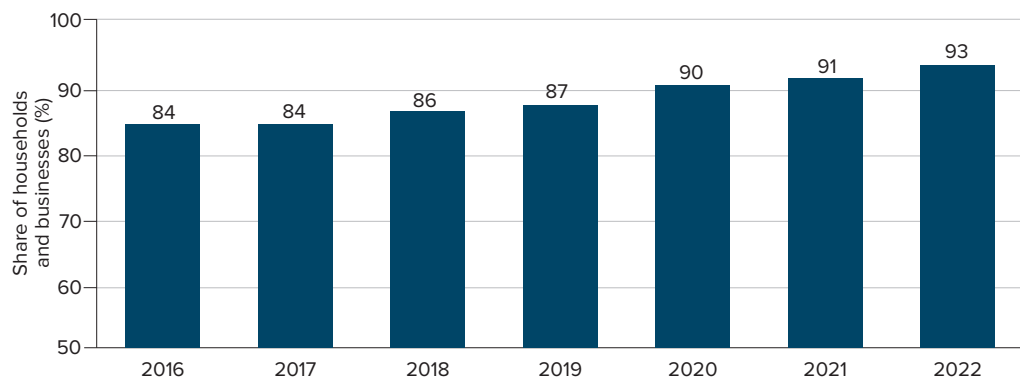
Source: Adapted from the CRTC (n.d.).

However, it is too early to declare victory in bridging the digital divide. Important gaps remain, with people falling through the cracks either because the internet is not available at minimum speeds or because they cannot afford it.

According to a survey on Toronto's digital divide by The Dais, cost was a significant barrier to purchasing home internet and cell phone services, and without adequate home internet, individuals lack the ability to access critical services and information. The survey, conducted in 2023, found that, of those without home internet, 29 per cent of respondents said it had impacted their access to government services, 26 per cent said financial services, 24 per cent said education, 18 per cent said health care and 14 per cent said work (Lockhart & Andrey, 2024).

Northern and Indigenous communities

In a 2023 report, Canada's auditor general concluded that, while internet and mobile cellular coverage has improved both nationally and in rural and remote communities, progress on access to high-speed internet and mobile services lags for those living in rural and remote areas, including First Nations communities.

At the end of 2022, 99.4 per cent of urban households had internet speeds available at the 50/10 (download/upload) Mbps target, compared to 67.4 per cent of rural households, 58 per cent of northern households and one-half of First Nations communities (CRTC, n.d.).

In addition, there is significant variation in the progress regarding the availability of target broadband internet speeds by province and territory (figure 2). While Quebec, Ontario and British Columbia are in line with the national average, the rate in other provinces is lower. In Canada's North, the situation is markedly worse, reflecting the economic and physical challenges of building and maintaining broadband infrastructure. Not even one of the 25 communities in Nunavut has access to internet service at the 50/10 (download/ upload) target level, with most limited to service at 5 to 25 Mbps and with data caps

Figure 2. There has been significant progress across the country, but gaps remain
Percentage of Canadian households and businesses with access to internet service with speeds of 50/10 and unlimited data transfer, 2016 and 2022
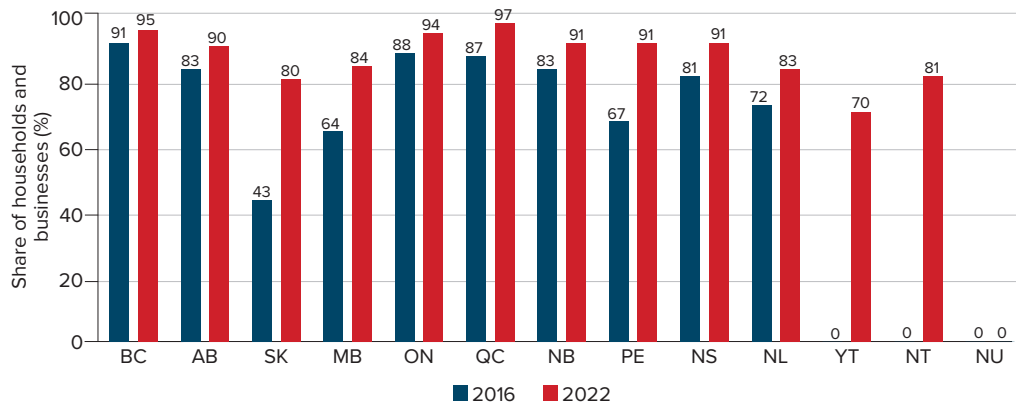
Source: Adapted from the CRTC (n.d.).

(Innovation, Science and Economic Development Canada, n.d.-c). This means that people and businesses in Nunavut cannot participate in video calls or stream videos and have difficulty participating in the digital economy.

Although Canada is generally on track to closing gaps in the availability of internet at minimum speeds, there are several factors that could impede its progress: geography, lack of co-ordination, funding delays, deployment delays and access to passive infrastructure.

In terms of geography, the North represents the most challenging situation. The three northern territories comprise about two-thirds of Canada's total land mass with a population of approximately 130,000 — about the same as that of Kelowna, B.C., or Sherbrooke, Que. (Statistics Canada, n.d.-b). Many parts of the North are accessible only by plane or by sea. For example, construction materials and essential supplies for Nunavut and Nunavik are sent by sea lifts, which operate seasonally because of ice conditions, and are often booked months or a year in advance. In other areas, road access is limited to when winter ice roads are in operation. In addition, construction techniques must be adapted to build on permafrost and sufficient skilled labour to do the work is not always readily available. The situation in the Northwest Territories and the Yukon is comparatively better (at least in the larger communities) because they are connected to the south by fibre rather than being entirely satellite dependent for the transport component of the network.

> Connectivity that is unaffordable or of poor quality will be little improvement over having no connectivity at all for Canadians. The impact of unaffordable access is felt by those communities who need it most, namely those living on First Nations reserves or in rural and remote areas.
>
> Office of the Auditor General of Canada (2023, p. 3)

One 2022 study found that the costs of providing mobile wireless services in Canada were 103 per cent higher than in a selection of peer countries and 44 per cent higher than those in the U.S. (Christensen Associates, 2022).

A lack of co-ordination between government departments and agencies operating in Indigenous communities also presents a major challenge because these communities face multiple intersecting social and economic challenges and may lack the capacity to deal with different departments. To date, there has been little co-ordination between federal departments and agencies to improve broadband internet availability or to develop a common approach to community engagement.

A related criticism identified by the auditor general (2023) was the delays in funding projects. The report points out that, of the federal funding available for use by the end of the 2022-23 fiscal year, 40 per cent was spent as of January 2023 (that's $949 million of the $2.4 billion available). While it is true that government programs are taking longer than expected to identify and fund viable projects, the proportion of funds *committed* to projects is higher than 40 per cent. Like many construction projects, funding is tied to various benchmarks within the larger project schedule and monies are dispersed at various stages of the process. As a result, funds committed to a project may be paid out over several years.

A lack of co-ordination within the federal government and between the federal government and the provinces and territories also impacts the length of time it takes to identify and fund projects. While Innovation, Science and Economic Development Canada (ISED) has primary responsibility for overseeing Canada's Universal Broadband Fund, it needs to work closely with other departments and agencies. A good example is ISED's relationship with the CRTC, which requires major telephone and cable companies to provide third-party providers with access to their fibre networks at regulated wholesale rates. In setting the rates, the CRTC balances affordability concerns with the returns required for the large companies to invest in their networks. The CRTC also has its own $750-million fund to invest in broadband infrastructure.

While the CRTC and ISED share information and co-ordinate their actions to some extent, they are limited by the fact that the CRTC is a quasi-judicial tribunal that operates at arm's length from government. In practice, this precludes the CRTC from sharing information about its deliberations or communicating its decisions (including those related to funding broadband projects) with ISED or any other part of government before they are published.

Another area of concern relates to the length of time to deploy or build facilities, particularly in rural areas. Supply-chain issues with fibre-optic cable and the associated electronics products as well as labour shortages are both major factors. While little empirical data specific to the telecommunications industry is available, labour shortages that began during the COVID pandemic continue to impact all sectors of the economy. In March 2024, there were 44,680 vacant positions in the construction industry, although the number has declined over the past two years (Statistics Canada, 2024a). In the United States, the Fiber Broadband Association, along with 10 other telecom trade associations, wrote to Congress claiming that the industry would need around 850,000 new skilled technicians to plan, build, install and maintain the networks being built over the next five years (Wireless Infrastructure Association et al., 2021).

Access to passive infrastructure, such as privately owned buildings and provincially owned utility poles, is also an impediment. The CRTC has jurisdiction over "transmission lines" as prescribed in the *Telecommunications Act*, but it is limited. Under the current act, the CRTC has limited direct jurisdiction over support structures, public property and privately owned buildings. The CRTC has used its condition of service powers under section 24 of the act to order access in certain cases. However, it does not currently have the explicit powers to resolve disputes, order access or establish guidelines regarding all support structures on public property or all privately owned buildings (residential or commercial) to facilitate projects. Instead, responsibilities over access to passive infrastructure are currently shared across multiple bodies and levels of government, which presents challenges for efficient and effective deployment of telecommunications infrastructure. Inefficient or delayed access to infrastructure such as poles, ducts and rights-of-way can dramatically increase the cost of deployment or cause facilities not to be built at all. This can slow the rollout of plans to improve access for rural and northern communities.

Low-income households

The 2023 report of the auditor general pointed out that neither the CRTC nor ISED had sufficient indicators to measure progress on the quality and affordability of internet access. The concern raised was that their approach to measuring affordability focused only on price, without considering income. Price alone does not indicate whether a Canadian household can afford internet or mobile cellular service. What is affordable for a household with two people earning $80,000 per year may not be affordable for a household with six people earning $30,000 per year.

In a 2020 internet use survey, when people without a home internet connection were asked why they did not have access, 63 per cent reported that they had no need or interest in a home internet connection, while 26 per cent reported the cost of internet service as the reason and 13 per cent cited the cost of equipment (Statistics Canada, 2021).

Almost half of households in Canada with an annual income of $30,000 or less did not have high-speed internet in 2018. Furthermore, access is worse for those with household incomes below $10,000. Average household spending on internet access services in 2021 accounted for 1.2 per cent of income. However, for households in the lowest income quintile, it accounted for 1.7 per cent of household income (Statistics Canada, 2023).

Internet service prices grew at a slower pace than overall inflation (CPI) between 2019 and 2021 and declined by 9.6 per cent in April 2024 from the same month a year earlier (Statistics Canada, n.d-a). Still, given that the average expenditure for internet service in Canada was around $74 a month in 2021, cost is likely a major contributing factor to the digital divide for low-income households facing rising shelter and food costs (Affordability Action Counci, 2024).

Government measures to address affordability have evolved over the past five to six years but remain limited. The Connecting Families initiative, established in 2018, is overseen by ISED but relies on internet service providers (ISP) to cover the costs of discounted

plans (Innovation, Science and Economic Development Canada, n.d.-d). While most of the major ISPs participate in the program, participation is voluntary.[4] Connecting Families 2.0, launched in 2022, introduced significantly faster speeds and increased data usage (Innovation, Science and Economic Development Canada, 2022b). For $20 a month, internet speeds are five and 10 times faster, respectively, than previously offered. As well, the data allotment doubled, from 100 gigabytes to 200 gigabytes of usage per month.

As of March 2023, more than 85,000 low-income households received a Connecting Families internet package (Innovation, Science and Economic Development Canada, 2023). By comparison, around 3.2 million families and seniors were in the lowest income quintile in Canada (Statistics Canada, 2024b). The second phase broadened eligibility, which will increase coverage. Initially, the program focused on families receiving the maximum Canada Child Benefit payment; that is, those with annual family net income under $34,863 and with at least one eligible child under 18 years of age. Phase two includes seniors receiving the maximum Guaranteed Income Supplement.

NorthwesTel joined the Connecting Families initiative in 2023 when the CRTC approved rates to provide eligible low-income Canadians in NorthwesTel's footprint with access to two internet packages: a plan with 15 Mbps download and 1 Mbps upload with 300 gigabytes of data for $10, with an overage charge of $1 per gigabyte; and a plan with the federal objective of 50 Mbps download and 10 Mbps upload with 400 gigabytes of data for $20 with the same overage charge (NorthwesTel, n.d.-a). The Connecting Families 1.0 plan is available to all its terrestrial communities, which includes DSL (slowest), cable and fibre (fastest), while the 2.0 version is available only to the cable and fibre communities. The telecom previously said it would not include satellite-dependent communities because none of the other ISPs in the current program provide that service to those areas.

Individual ISPs have also introduced company-specific measures to address affordability. For example, Rogers' Connected for Success program offers high-speed, low-cost internet, TV bundles and mobile services to those receiving eligible provincial income support, disability benefits, seniors receiving the federal Guaranteed Income Supplement, or rent-geared-to-income tenants of non-profit housing partner organizations. The cheapest plan is $9.99 before tax and offers 25 Mbps download and 5 Mbps upload. The most expensive is $34.99 before tax with 150/30 Mbps (Rogers, n.d.).

For its part, TELUS' Internet for Good programs provide 25/5 Mbps internet for $10/month to families receiving disability benefits, low-income seniors, youth aging out of the child welfare system, and students in need in Alberta and British Columbia. And the TELUS Tech for Good program provides 10,000 people living with disabilities training and assistive technology (TELUS, n.d.).[5]

Other measures have been introduced by provincial or municipal governments, but they are highly localized and have limited participation.

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[4] Eighteen ISPs participate in the program including Bell Canada, Cogeco, Vidéotron, Rogers, TELUS and SaskTel (Innovation, Science and Economic Development Canada,, n.d.-d).
[5] Discounted plans for 50 Mbps and 150 Mbps services are also available at $20 and $35, respectively.

WHAT CAN BE DONE TO BRIDGE THE GAP?

Improve co-ordination within and across governments

Several of the barriers to expanding the availability of high-speed internet stem from a lack of effective co-ordination between governments at every level — federal, provincial, territorial, municipal and Indigenous. For example, greater co-ordination could help overcome the CRTC's lack of direct jurisdiction over the passive infrastructure needed to expand fibre networks such as support structures, public property and privately owned buildings. Attaching cables and fibre to existing passive infrastructure is a faster and more cost-effective way to build out broadband networks. In rural and remote areas, networks will need to rely on hydro and telephone poles because they are the only existing supporting structures near homes and businesses. However, hydro utilities have little incentive to co-operate with telecoms and it can take months to process and issue the necessary permits and undertake pole retrofits (Rogers, 2022a).

In 2017 and 2018, the minister of ISED convened ministers and senior bureaucrats from federal, provincial and territorial governments to reach an agreement on a long-term strategy to improve access to high-speed internet services (Innovation, Science and Economic Development Canada, 2018). These meetings in turn fostered a number of federal-provincial agreements supporting the build-out of infrastructure capable of providing high-speed internet services. One such agreement, the "Canada-Quebec Operation High Speed" initiative, which included a co-ordinated infrastructure permit process, led to Quebecers having the highest connectivity rate in Canada with a 99 per cent coverage rate (Prime Minister of Canada, 2021).

A renewal of federal-provincial-territorial negotiations could form the basis of a co-operative approach to passive infrastructure. Consider two important pieces of passive infrastructure: access to utility poles of provincial electric utilities and municipally owned light poles. Most electric utilities in Canada are provincially owned and regulated and are strategic provincial assets. In most if not all cases, provinces would be unwilling to cede oversight to federal jurisdiction. A more acceptable model might be to negotiate federal-provincial-territorial agreements that identify specific passive infrastructure and establish a framework with appropriate terms and conditions for access. This could include agreements on methodology and financial considerations. The actual rates and terms would be established by an expert body — most likely, but not necessarily, the CRTC — and applied by the relevant provincial or territorial authority, thus avoiding jurisdictional disputes.

Similarly, in the case of municipal access, the CRTC or another qualified body could develop model access agreements, or templates, to help municipalities avoid reinventing the wheel every time. The model agreements would need to balance the economic interests of municipalities and service providers, and most importantly the public's interest in having available the best technology at reasonable rates. Such an approach is not unproven. In the United States, the Federal Communications Commission enabling legislation provides it with the ability to establish advisory committees and it has used that authority to set up a committee to develop model tariffs for access to certain municipal facilities (Federal Communications Commission, n.d.).

Some observers will no doubt question the utility of such an approach, suggesting it is too simplistic to overcome the complex and conflicting interests of various levels of government and private interests. However, it is no more complex than negotiating funding agreements in support of building out broadband infrastructure. Negotiated outcomes are also likely the only method for resolving jurisdictional conflict in a timely manner because new legislation or revisions to the *Telecommunications Act* would be fraught and potentially face legal challenges from provincial governments.

There is also room for improvement in co-ordination within the federal government. ISED should co-ordinate with Crown-Indigenous Relations and Northern Affairs Canada to develop more effective relationships with Indigenous communities, and to explore the potential for more Indigenous-owned fibre assets, similar to approaches used in the territories. A 2021 report by the Institute for Fiscal Studies and Democracy recommended a single door for federal funding, so that applicants would apply to the same program and officials could work behind the scenes to determine the most appropriate pot of money from which to provide support (Gaspard & Khan, 2021).

On the challenge of internet affordability, ISED should co-ordinate more closely with Employment and Social Development Canada (ESDC), which is the lead department on poverty reduction. ESDC will have a better understanding of the challenges facing low-income households struggling to purchase basic needs such as shelter and food, and the type of supports needed. Currently, affordability programs are insufficient and unco-ordinated, in part because there is no clear government lead (at any level of government) and therefore no real accountability or financial commitment. While many observers might expect that the responsibility would fall to the federal government department responsible for telecommunications policy (ISED), it is equally a social welfare and education issue with mixed responsibility within the federal government and cross-jurisdictionally with provincial, territorial and municipal governments.

Moreover, existing programs rely too much on voluntary actions of the private sector. While ISED worked with industry participants to establish the Connecting Families initiative, the program is voluntary, not national in scope and has no specific elements to measure affordability. Rather than developing programming to address affordability, the policy focus has been on consumer prices for telecom services more broadly, including policy measures to enhance price competition within the industry.[6] While overall reductions in rates would be helpful, they do not address the affordability issue for those most in need.

Prioritize northern and Indigenous communities

Although the territories and the northern regions of provinces make up a relatively small part of Canada's population, governments should focus on developing policy solutions to address the digital divide in the North, with a particular focus on Indigenous communities. While some might question the logic of having governments focus their limited resources on a small minority of the population, there are good reasons for doing so, starting with Indigenous reconciliation and the security of our borders.

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[6] The most recent example is an Order Issuing a Direction to the CRTC on a Renewed Approach to Telecommunications Policy (Government of Canada, 2023).

Indigenous people in Canada are disproportionately affected by the digital divide, which has had negative impacts on their communities. As already noted, the lowest levels of high-speed internet penetration are in Indigenous communities. As a result, many people in Indigenous communities are unable to access important information about their rights, health care, education and job opportunities.

For example, many communities lack the necessary infrastructure to support online learning, higher education and skills development. Similarly, in health care, the lack of infrastructure limits the availability of telehealth and digital health care resources that can bridge the physical remoteness of many communities. Consider, for example, how improved access to high-speed broadband in Nunavut could make available mental health services desperately needed to combat record high suicide rates (Deloitte Canada, 2024). Expanded availability and adoption of high-speed broadband will also generate economic opportunity for Indigenous communities. Remote work and e-commerce will allow individuals to remain in their communities while pursuing or exploring their entrepreneurial potential. Together, this will help sustain healthier communities throughout the North that are, in turn, a key component of Canada's Arctic sovereignty and the security of our northern border.

Services in the territories are provided by a small number of firms, most notably NorthwesTel, which is the primary service provider in the Yukon, the Northwest Territories and Nunavut. In June 2024, a consortium of Indigenous communities in Yukon, the Northwest Territories and Nunavut known as Sixty North Unity said it intends to purchase NorthwesTel from Bell Canada for $1 billion. The proposed transaction would make NorthwesTel the largest Indidenous-owned telecommunications company in the world. The consortium has committed to doubling internet speeds for fibre customers, meeting high speed standards for 97 per cent of homes in the Yukon and Northwest Territories, investing in new fibre projects to add resiliency to wildfires and offering satellite service to communities in Nunavut (Bell Canada, 2024).

A satellite-based competitor, Qiniq, is also active in Nunavut and Yellowknife. The business case for these firms is economically challenging and, absent subsidies — implicit or explicit — it is unlikely that comparable levels of service can be provided at rates similar to those in the south.

In recent years, some large internet service providers have expanded support for Indigenous communities. For example, TELUS publishes an annual report on Indigenous reconciliation and connectivity with specific targets and timelines (TELUS, 2023). Rogers released in 2022 a Truth and Reconciliation Commitment Statement (Rogers, 2022b) and is a member of the Canadian Council for Aboriginal Business' Progressive Aboriginal Relations program.

The CRTC has a major proceeding underway to examine and improve services in the North. It held public hearings in Whitehorse in April 2023 (CRTC, 2023b). It is particularly noteworthy (and praiseworthy) that the CRTC has explicitly included reconciliation as a regulatory objective in the proceeding, stating that "Reconciliation is one of the Government of Canada's and the CRTC's commitments to renewing the relationship with Indigenous Peoples, based on the recognition of rights, respect, co-operation and partnership" (p. 4).

CRTC consultations on services in the Far North resulted in the CRTC requiring NorthwesTel to eliminate a $20 monthly surcharge for customers who do not purchase its home phone service. Long-term solutions will almost certainly require government involvement in a number of possible forms (e.g., capital investment in facilities, direct subsidies to operators, end-user subsidies, etc.), some of which are beyond the CRTC's regulatory ambit.

Satellite technology is an area that is worthy of more attention. Geostationary satellites (GEOs) have long been used to provide telecommunications service in Canada's North. For example, all of Nunavut's telecommunications services are currently provided through a mix of satellite services because there are no fibre connections to the territory. In the case of geostationary satellites, a service provider leases satellite capacity from an operator and connects it to an Earth station in a community. Broadband and other telecommunications services are distributed through the community on a wired or wireless basis by a local provider.

More recently, we have seen the development and deployment of low Earth orbit systems, commonly referred to as LEOs. These satellites operate at a much lower altitude than GEOs, at a height of 250 to 2,000 kilometres. The proximity of these satellites to the Earth's surface is key as it reduces latency (the amount of time it takes for a signal to travel between the sender and receiver, usually measured in milliseconds),[7] which is the key differentiator between fibre- and satellite-delivered high-speed internet services. The lower latency of LEOs makes satellite internet a comparably fast alternative to fibre, particularly in remote areas, and governments are increasingly recognizing the role that LEOs can play in bridging the digital divide.[8]

There is, however, a strong bias in favour of funding fibre-based broadband projects. This is justified in part by the almost unlimited capacity of fibre-based systems and trust in a more established, well-understood technology. Internet speeds with LEOs can be affected by weather, obstacles and use, while fibre is not. But fibre is not necessarily well suited to serving remote areas like the Canadian North. To illustrate, there are several proposals for extending an undersea fibre to Iqaluit, the capital of Nunavut, but there are more than 20 other satellite-dependent communities in Nunavut that are unlikely to be connected by fibre. One plan to bring fibre from Newfoundland was estimated to cost at least $200 million (Tranter, 2023). There are also concerns about the robustness of fibre-based facilities in such remote areas, as demonstrated by the many network outages experienced by people in Yukon and the Northwest Territories, both of which are served by fibre-based facilities. Wildfires, for example, have disrupted internet access in recent years (Elliot, 2024). Greater support for an integrated approach utilizing the relative strengths of each technology, and an assessment of the relative costs by region, is worthy of consideration and could help to overcome the digital divide more quickly in Canada's remote areas.

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[7] Geostationary satellites are located approximately 36,000 kilometres from the Earth, so the latency is about 120 milliseconds in each direction. Typical fibre latency, by comparison, is around 10 to 15 milliseconds. LEOs' latency is comparable to that of fibre-based systems.

[8] The federal government, along with Quebec and Ontario, has invested in Telesat's Lightspeed initiative. Several provinces have adopted programs to subsidize the upfront equipment costs for Elon Musk's Starlink service. The federal government is also supporting faster internet speeds in Nunavut through Qiniq.

Expand discounted internet plans

To put it simply, there is insufficient financial support for low-income Canadian households to help them access high-speed broadband services. More must be done at all levels of government to ensure connectivity. The challenge of addressing affordability will not be met through existing measures such as the federal government's Connecting Families initiative or other measures introduced voluntarily by service providers.

Nor will the challenge of affordability for disadvantaged groups be met by providing the industry regulator, the CRTC, with additional policy guidance to focus on the issue. The CRTC already has affordability as part of its statutory mandate and will continue to use its authority as an economic regulator to address affordability. This can include measures to enhance competition in the sector or to prescribe wholesale rates for broadband service in particular circumstances as it has done for broadband rates in northern areas served by NorthwesTel, where the CRTC determined that there was insufficient competition to protect consumers.

However, regulatory measures adopted by the CRTC are designed to serve the broader public interest and must necessarily consider a wide range of issues including network quality, reliability, security, robustness and continued investment in the infrastructure. While the CRTC could develop a subsidy program to address affordability for disadvantaged groups, it would require a significant financial commitment from the government, as is the case in the United States. Otherwise, the CRTC is not particularly well suited to address such a broad societal issue that better fits within the mandates of other departments, and agencies across multiple levels of government. That is not to say the CRTC cannot do more to address affordability. It can and should do so, but on its own and without specific funding, it cannot do enough.

As Canada considers how best to support affordable access to the internet, it is worth looking south of the border. In late 2021, the U.S. *Infrastructure Investment and Jobs Act* became law. It provided US$14.2 billion to modify and extend the Emergency Broadband Benefit Program to a broadband affordability program called the Affordable Connectivity Program (ACP). Within 12 months, the Federal Communications Commission had opened the application window for an ACP pilot program that covered more than 20 million households (Federal Communications Commission, 2023). Under the ACP, eligible families could receive a benefit of up to US$30 per month applied to the cost of their internet service. ACP-eligible households who live on Tribal lands were eligible for a benefit of up to US$75 per month. Eligible households could also receive a one-time discount of up to US$100 to purchase a laptop, desktop computer or tablet from participating providers. Moreover, the eligibility criteria were broad. Individuals were automatically eligible if anyone in the household qualified for government assistance programs like Medicaid, the Supplemental Nutritional Assistance Program, or SNAP (formerly referred to as food stamps), federal housing assistance, among others, or if they were below a defined household income level.[9]

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9 About US$60,000 a year for a family of four or US$29,000 a year for an individual.

At the time of writing, the ACP was slated to wind down in May 2024 due to a lack of support in Congress for additional funding. Reviews of the program were mixed because it was difficult to show how many households would have lost access to internet services in its absence. One household might have cut their internet subscription, while another may have cut back on food in the face of an equivalent affordability challenge. There were also around 5 per cent of unconnected households that had failed to take up the service. Speculation as to the reasons why include lack of awareness; a complex enrolment process; lack of digital literacy; cost of a computer; insufficient subsidy; and access to an alternative method of internet access (Fruits & Stout, 2023).

Other jurisdictions provide internet subsidies in different ways. The state of South Australia, for example, provides free internet to eligible families with school-aged children (Department of Education, n.d.). New Zealand Aotearoa provides one-time grants to eligible households and communities in the most remote areas where broadband is not currently available to go toward installation costs of a suitable broadband solution (Crown Infrastructure Partners, n.d.).

In Canada, there are other examples of providing low-income households with services at prices that are geared to income, for example community housing, which is provided by non-profit organizations or governments. It is surprising and somewhat ironic that Canada, which takes pride in its superior social safety net, has not found a solution to address the affordability and adoption of high-speed broadband.

There is an opportunity to learn from the experience of other countries and develop an approach that is both more targeted at those in financial need and more attractive and accessible to those who do not currently have internet access. A critical first step is for the federal government to commit to providing the necessary funding — possibly drawn from the proceeds of spectrum auctions — to overhaul existing support programs.

ISED and ESDC should also be asked to co-develop a program that provides a benefit to low-income households to defray monthly internet costs. Eligibility should be expanded beyond the families and seniors covered through the Connecting Families program to include the one in five single working-age adults living in poverty (Community Food Centres Canada, 2023). Households in areas with higher costs, such as northern and remote regions, could receive higher subsidies.

The program design should make it easy for households to receive the benefit. For example, ISED, ESDC and the Canada Revenue Agency could co-ordinate their efforts to define eligibility requirements and automate the process to the maximum extent possible, recognizing that low-income households and other marginalized groups are less likely to be aware of government subsidies or to apply for them. Provincial and territorial income assistance programs could complement federal efforts with programs to close gaps. For example, research shows that 10 to 12 per cent of Canadians do not file a tax return and therefore do not receive benefits for which they are eligible (Robson & Schwartz, 2020).

It would also be worth exploring additional complementary programming at all levels of government to increase the uptake of home internet services, such as subsidized computer purchases, expanded library access with staff that can provide support, and one-time grants for low-income remote households to install the equipment needed for satellite-based internet.

Finally, as recommended by the Office of the Auditor General (2023), the federal government should collect and analyze data, including consideration of household income, to measure progress against the affordability objective of its connectivity strategy — in addition to its goal of expanding adequate internet infrastructure to 98 per cent of households by 2026 and to 100 per cent by 2030.

CONCLUSION

Ensuring that all Canadian homes and businesses have access to quality high-speed broadband services should remain a first-order priority. However, we can no longer measure progress on the digital divide solely through the availability of high-speed internet to all Canadians. We need to consider the magnitude of societal benefits associated with community access, and the ability of low-income households and northern and Indigenous communities to access high-speed internet.

Canada prides itself in its superior social safety net, but still has not found a solution to addressing the affordability and adoption challenges of providing high-speed broadband internet access to low-income households and northern and Indigenous communities. Improving high-speed access in Indigenous and northern communities and providing an improved financial benefit to low-income households should be the key priorities in the government's efforts to conquer the next frontier of the digital divide.

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