

PART 2 - RURAL CONNECTIVITY REPORT



Boosting the Signal:

Pathways to Improving Digital Equity in Eastern Ontario

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Boosting the Signal: Pathways to Improving Digital Equity in Eastern Ontario

For as long as we have had the internet, we have had a digital divide between urban and rural communities. Rural residents experience slower speeds, less reliable service (at times no service at all), and all at a higher cost, compared to their urban counterparts. While the digital divide has been top-of-mind for rural communities for a long time, the pandemic has heaved the urgency of this disparity to the forefront of municipal agendas. As so many critical activities and services are pushed online - and many of which may remain there permanently, at least to some degree - some rural residents are left without the ability to socialize, learn, work, access services, and run their businesses with the same reliability and efficiency as the rest of the country. Now, more than ever, we cannot afford to wait for private market forces to resolve connectivity issues in rural communities.

Poor connectivity in rural areas is a case of market failure. The significant demand for high-speed internet in rural and remote areas has not been sufficiently met by private sector service providers, due largely to the high cost of infrastructure in lower density areas. As Internet Service Providers (ISPs) seek to achieve the highest possible return on investment for their shareholders, they are bound to find those returns on investments in relatively more densely populated and wealthier neighbourhoods. Many rural and remote communities do not have such favorable market conditions and so, even with federally available subsidies to offset the initial cost of infrastructure, they will not offer a rate of return for ISPs in either the short or the long run¹. Yet, as connectivity has become as vital to a community's economic prosperity and daily life as well-maintained roads and bridges, we find ourselves at a critical moment of time, requiring out of the box solutions to address complex problems.

This report is the second part of a three-part report series produced for United Way East Ontario, by the Social Planning Council of Ottawa and National Capital FreeNet, as part of the Digital Equity Ottawa initiative. The first report (Part 1) explores digital equity in urban Ottawa, across four pillars: connectivity, devices, digital literacy and the digital capacity of the voluntary sector. The third report (Part 3) explores creating an alternate internet initiative based on mesh technology. This report applies the digital equity four pillar framework, through a rural lens. In particular, it lays the groundwork for digital equity initiatives in rural areas, focusing on rural Eastern Ontario, by doing the following:

- It assesses the four pillars of digital equity from a rural perspective, identifying rural-specific considerations and opportunities for digital equity initiatives;
- It outlines why digital equity matters to rural communities, including the cost of inequity and the opportunities available as a result of digital equity initiatives;
- It identifies the key players in digital equity initiatives in rural Eastern Ontario;
- It explores what is possible for rural digital equity, including a variety of models and examples from other jurisdictions, and highlights some best practices;

¹ Broadband Connectivity in Rural Canada Brief to the Standing Committee on Industry, Science and Technology by the Eastern Ontario Wardens' Caucus (EOWC) and the Eastern Ontario Regional Network (EORN).

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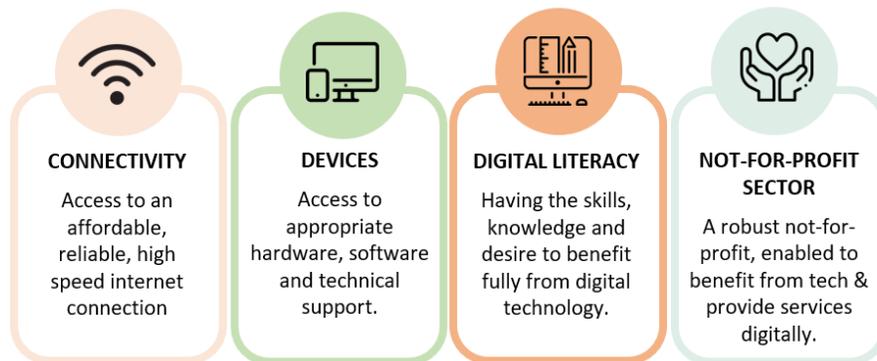
- It briefly explores 12 priority areas in Eastern Ontario that face particular challenges in closing the digital divide, including internet speeds, community assets and key socio-demographic variables;
- It identifies a strategy for moving forward with digital equity initiatives in the priority areas; and
- It outlines recommendations for strategies that will improve digital equity for rural residents in Eastern Ontario, including identifying 14 potential pilot programs.

The report is based primarily on available data (particularly CIRA, CRTC and Stats Can), key informant interviews, as well as a literature review and a scan of rural digital equity initiatives in other jurisdictions.

Digital Equity in Four Pillars: The Scope of the Digital Divide in a Rural Context

Digital Equity can be defined as the ability of individuals and groups to access and use information and communication technologies. It includes not only access to the internet but also the availability of hardware and software; and the necessary digital literacy skills required to use technology effectively. In addition, the capacity of the not-for-profit sector to provide services digitally, including for residents with low technical capacity, is fundamentally important to a digitally equitable community.

Four Pillars of Digital Equity



Digital Equity Ottawa, 2020

Connectivity

Connectivity, in a digital equity context, means that all residents have access to affordable, reliable and adequately fast internet connections. When it comes to rural digital equity, connectivity dominates the discussion.

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The majority of households in rural Eastern Ontario, particularly those outside of the main hubs or denser areas, still do not have the option of broadband internet². Rural households instead typically rely on Fixed Wireless technology, using towers installed on rooftops and outside of homes – a common sight in rural Ontario. In a fixed wireless connection, a base station is used to transmit the internet over radio waves to a receiver installed on each home. The homeowner is responsible for the cost of the initial installation of the tower, which can range from approximately \$800 to \$2000, as well as any maintenance or upkeep. A fixed wireless connection can be particularly challenging for households with more than one resident, as the available bandwidth is split between each device that is connected. This can be impractical for households with multiple family members attempting to study and learn from home at once. In addition to being slower, fixed wireless technology is not as reliable as broadband internet, resulting in relatively frequent outages and connectivity slowdowns.

Data caps are also a common factor in rural areas. Many internet packages have a set data limit, and users pay a fee per GB of data that exceeds their plan. As a result, some residents need to closely monitor their data usage, and may need to limit the use of streaming video and large downloads in order to avoid costly overage charges.

Compounding this issue is the fact that, in rural areas, many residents have limited choice of providers, as there are frequently only a few serving each area³, unlike in urban environments. A lack of competitiveness between providers means that there is less pressure to ensure low price or good service. On average the cost of rural internet packages purchased by residents is 10% higher than urban users⁴ – however, this cost is for significantly less service compared to what urban residents receive, and often includes monthly data transfer limits, resulting in the potential cost overages.

Internet speeds are a key component of rural connectivity. Frozen screens, zoom calls that drop, videos that won't buffer, and documents that time out before they can upload are all familiar experiences for rural users. The Canadian Radio-television and Telecommunications Commission (CRTC) establishes a universal service standard, reflecting the *minimum* internet speeds required for Canadians to use the internet effectively. Connection speeds below the set threshold are not able to reliably handle the day-to-day requirements of an average Canadian household. In 2016, the CRTC determined this minimum standard to be: 50 megabits per second (Mbps) download and 10 Mbps upload⁵. The CRTC's target is to have 90% of Canadian homes and businesses meeting that standard by the end of 2021, 95% in 2026, and 100% by 2030.⁶ While urban areas generally have those speeds available, rural areas generally do not.

According to the most recent CRTC data, 45.6% of rural households have access to the minimum set standards described above, compared to 98.6% in urban areas. Of note, the percentage is even lower for First Nations reserves, which are at a concerning 34.8%⁷. However, these numbers may not paint the full picture. Firstly, similar to urban users, having access to fast internet does not necessarily mean that all residents can afford the cost of connection. Even more commonly, though, is that the true speeds

² CRTC. Government of Canada (2020). Communications Monitoring Report 2019.

³ CRTC. Communications Monitoring Report 2019. Released 2020

⁴ CRTC. Communications Monitoring Report 2019. Released 2020.

⁵ CRTC. Telecom Regulatory Policy CRTC 2016-496.

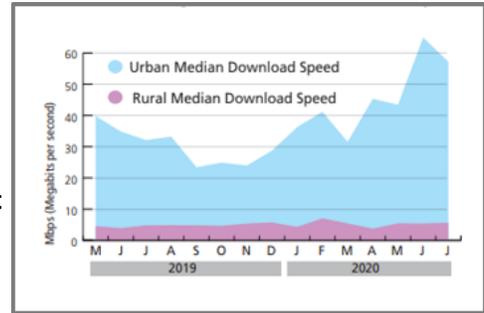
⁶ ISED Canada. "High-Speed Access for All: Canada's Connectivity Strategy." 2019.

⁷ CRTC. Communications Monitoring Report 2020. Released 2021.

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delivered to rural homes do not compare to the speeds that Internet Service Providers (ISPs) claim they are able to provide. While the CRTC relies on ISP provided data on speeds, the true experience of rural users paints a more dire picture.

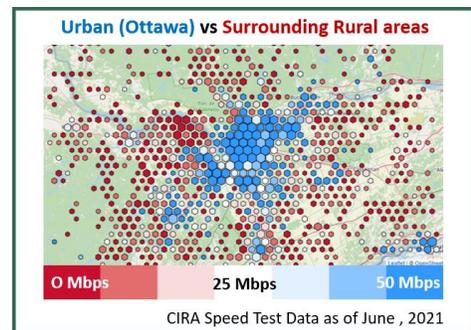
A more accurate representation of rural speeds is captured by the Canadian Internet Registration Authority (CIRA)'s Internet Performance Test, in which users perform voluntary speed tests that are assigned and mapped to their location (see: <https://performance.cira.ca/>). According to the data, the **true average download speeds available to rural Canadians was just 5.5 Mbps – which is one tenth of urban speeds (51.54)**. As well, where urban users have experienced significant gains since the beginning of the pandemic, rural internet users have seen virtually no gains.



Download speeds for Urban vs Rural internet users. Graph created by CIRA.

Notably, of the 12 rural Eastern Ontario neighbourhoods profiled in this report, CIRA data revealed that in 8 of the 12 areas, not a single speed test performed over a two-year period met the minimum 50/10 standard⁸. This should be an alarming finding for those concerned about digital equity in rural Eastern Ontario.

The following heat map of speed test data paints an accurate picture of the experience of urban and rural residents. The blue area is urban Ottawa, in which many residents are accessing speeds in excess of the 50/10 standard. Meanwhile, the red area maps closely to the rural communities, whose speeds are barely reaching 5mbps/1mpbs speeds -- one tenth of the CRTC standard. Not captured in the data are the households that have no internet, or their internet was in fact too slow to complete the speed test. This stark contrast is the visualization of the digital divide.



Heatmap of urban vs rural speeds surrounding Ottawa. Screenshot captured from CIRA portal.

Why does this problem persist? In addition to the significant market failure challenge, various administrative barriers were identified as a part of this study, including:

- Permitting and approval barriers and delays with the municipalities, including Municipal Access Agreements, which can be prohibitively strict. As one speaker said, “sometimes we are our own worst enemy when it comes to making progress”. Similarly, one provider spoke about a 1.5-year delay for projects to be approved. We heard of neighbourhoods that were “wired up, but we could never switch them on” because of the approval process.
- Challenges related to working with Utility providers (Hydro One and Hydro Ottawa), including lengthy permitting and approval processes to access utility poles, eg. through Joint Use Agreements. As well, frequently under-built infrastructure meant that poles often cannot support fiber cables needed for broadband internet. Hydro One’s network in particular contains

⁸ CIRA Newsroom, 2020. “New internet performance data shows urban speeds improving while rural speeds plateau”

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some poles which are over 50+ years old. Furthermore, it is not uncommon to install the bare minimum, rather than considering future users. As a result, laying fiber can mean replacing an entire stretch of utility poles, which significantly increases the price of the installation⁹.

- The CRTC is under increasing criticism for failing to adequately regulate the industry, including recently - overturning a decision which would have lowered costs for residents, and which would have made new projects more viable. Smaller and medium sized Internet Service Providers report significant challenges in accessing the networks of the largest providers, whose interests are thought to be over-represented by the CRTC.
- Federal funding programs skew towards the major ISP providers, as projects often need to be “shovel ready” and completed in short time frames. This requires significant upfront costs which might not be viable for smaller providers, nor for applicants such as municipalities and community groups. This is important because it is the smaller players who are often most invested in improving access to the most under-served areas.

Connected Devices

Access to connected devices is the second pillar of digital equity. It speaks to the ability of residents to acquire appropriate hardware for their digital needs, in appropriate numbers for their household, as well as the necessary accompanying software. For more information about this pillar, see Part 1 – the Urban Connectivity Report.

Although the issue of access to devices is shared across urban and rural boundaries, important factors in the rural context include long standing challenges related to transportation, cost, and access to retailers. Rural residents are often significantly further from retail outlets, and not necessarily able to access as many retailers for the purpose of price shopping. As well, fewer options exist for purchasing used devices, and rural residents may not have access to device-sharing or refurbishing type initiatives, as such initiatives are typically operating in urban centers. Lastly, rural areas have on average lower incomes¹⁰, which impacts the affordability of devices and software.

Ability to Use: Digital Literacy

The ability to obtain an internet connection and a connected device has little benefit without the ability to use devices, navigate the internet, and to have the desire to do so. Ideally, this also includes access to affordable and timely technical assistance for when challenges inevitably arise. For more information about this pillar, see Part 1 – the Urban Connectivity Report.

Although the importance of digital literacy is shared across urban and rural contexts as well, there are several characteristics of rural areas that impact overall digital literacy for residents. For instance, it is

⁹ Note: challenges related to both Utility providers and municipalities could be addressed in part through the newly proposed Supporting Broadband and Infrastructure Expansion Act. The legislation proposes to reduce the delays and costs associated with accessing hydro utility poles, and would require timely access to municipal rights of way in order to install broadband on municipal land.

¹⁰ Statistics Canada. Census of Population, 2016.

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important to note that rural areas have overall fewer young people, and in some cases a disproportionately high population of seniors¹¹. On average, seniors have a greater digital literacy gap compared to younger residents, and it is not uncommon for younger generations to play a “tech support” role for older generations. This is not always possible in rural areas when younger generations are leaving the community in large numbers. Rural areas also have fewer opportunity for digital literacy training, and a lower level of literacy overall, including digital literacy¹². Lastly, as rural residents have traditionally had fewer opportunities for digital services, it is likely to be less a part of the culture for some rural residents, relative to their urban counterparts. The latter point speaks to the desire to use technology, which is integrally connected to the ability to do so.

Capacity of the Not-For-Profit Sector

The final pillar of digital equity relates to the capacity of the social services and the not-for-profit sectors to use technology, offer digital services, and support those with low technical capacity. For more information about this pillar, see Part 1 – the Urban Connectivity Report.

While this pillar is also shared between rural and urban communities, there are some particular considerations for rural communities. Firstly, in some cases, the service providers themselves do not have reliable, high speed internet, particularly in more remote areas. As we heard through the interviews for this report, in some cases, rural service providers found the rapid shift to delivering virtual services during the pandemic to be especially challenging, particularly where they did not have appropriate connectivity, they did not have adequate devices, it was less a part of their culture to operate virtually, and it was a greater adjustment for clients. In cases where clients do not have connectivity, accessing digital services was simply not possible.

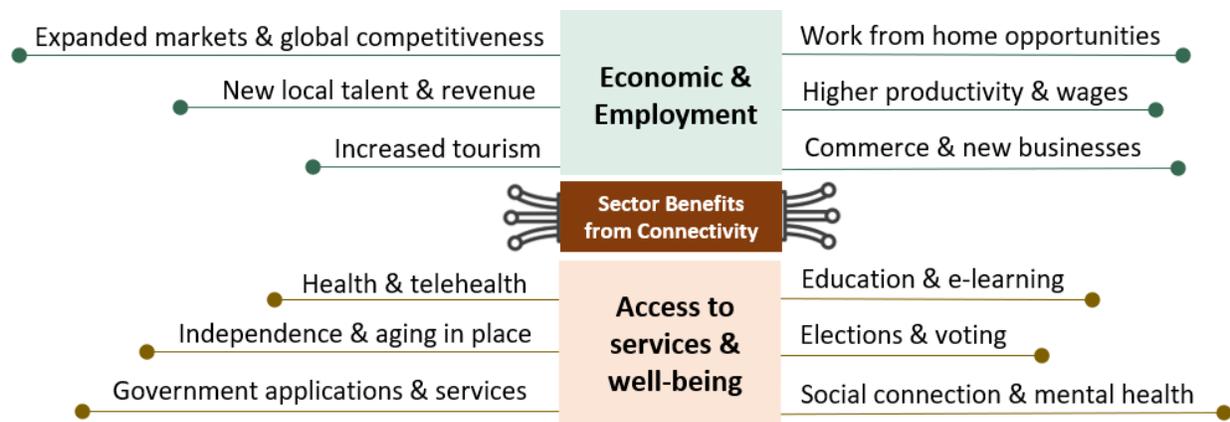
A challenge identified in rural Eastern Ontario was that service providers have typically “gone their own way” when it comes to digital equity. In general, there has not been a cohesive plan to improve the digital capacity of the sector, or support their clients’ digital needs. This changed somewhat during the pandemic with some agencies such as community support services for seniors coming together to distribute devices to their clients and support the clients to use them. Where there has not been a comprehensive collaborative strategy to date, many in the voluntary sector that were consulted for this report felt that digital access has the potential to resolve some of their significant challenges in rural areas - such as transportation and reaching clients. For example, one agency noted that their virtual AGM during COVID was the best attended, most engaging AGM they had ever experienced to date -- in this case, it was simply more accessible to their clients in a virtual format than it had been in person. Digital connectivity presents immense opportunities for the social services and not-for-profit sectors, but the historic under-funding of their tech capacity (connectivity, hardware, and skills) will have to be remedied.

¹¹ Statistics Canada. Census of Population, 2016.

¹² Canadian Research Data Center Network, 2019. “Location, location, location: Examining the rural-urban skills gap in Canada”.

Overview of the Benefits of Digital Equity for Rural Areas (and the cost of Inequity)

Digital equity is quickly becoming one of, if not the primary issue of concern identified by rural communities¹³, and for good reason. Connectivity and access to the internet is now as important as roads and bridges to the daily life and economic health of all communities. The importance of digital equity can be broadly broken down into Economic and Employment benefits, and Access to Services and Well-being.



Adapted from ROMA, 2020

Economic and Employment

There are significant economic and employment implications of poor internet access in rural areas. Rural areas without sufficient internet access face revenue loss, brain drain in talent and development, a loss of jobs and reduced competitiveness on a global scale. Local business and the labour market are equally impacted.

Business & Commerce

The organization Advancing Career Development in Canada stated that “connectivity is one of the first things businesses consider when deciding to establish themselves in a community. Consequently, low-quality and high-cost internet can seriously hamper the economic development of rural, northern and remote regions”¹⁴. In addition to having an impact on where businesses set up shop, internet availability also impacts the way businesses operate. As was painfully evident through the COVID-19 pandemic, businesses that had limited or no internet access were at a serious disadvantage to those who were able

¹³ ISED. 2019. High-Speed Access for All: Canada’s Connectivity Strategy.

¹⁴ ISED. 2019. High-Speed Access for All: Canada’s Connectivity Strategy.

to pivot to virtual models. As those virtual offerings are very likely to remain in place permanently, at least in part, there are serious concerns about the viability of businesses that were not able to make the shift. This is supported by EORN’s finding that rural businesses have traditionally experienced difficulty connecting to global markets, and are therefore unable to compete with urban and global counterparts¹⁵.

The Eastern Ontario Regional Network (EORN) found the absence of broadband internet to be a key factor in business retention surveys conducted by the region’s economic development authorities: local businesses find it increasingly difficult to compete in a wired world. They are now explicitly considering broadband availability as a factor in plans for staying or growing in their existing host communities. EORN found that an estimated 30,000 small businesses in Eastern Ontario were often unable to get online to undertake online market research, maintain an online marketing presence for their products and services, capitalize on online education, training, and social media opportunities, or use broadband for wide range of administrative and business management services¹⁶.

Economic Impact and jobs

Although it is difficult to assign a dollar figure, it is widely accepted that broadband internet increases the economic prosperity of a region. A Canadian study found that, historically, broadband deployment across Canada has promoted growth in aggregate employment and average wages, particularly in rural regions. This same study estimates that providing broadband access in Canada where it did not exist previously would increase employment growth and average wage growth in service industries by 1.17 and 1.01 percentage points respectively per year in rural regions¹⁷

★ SPOTLIGHT: Farming in the digital divide

The state of agriculture in rural communities is shifting. Local, small scale family farms are in decline, and the ongoing lack of adequate internet service in rural areas threatens to exacerbate that trend. A brief submitted by the Canadian Canola Growers Association (CCGA) to the Federal Government’s Standing Committee on ICT Accessibility, explained: “the agriculture sector is affected by delays in connecting rural and remote regions. Farmers lose precious time owing to unreliable Internet connections. For example, it might take hours to download software for farm equipment, particularly during peak periods of the season. Furthermore, the adoption of smart farming, which depends on new agriculture technologies that require large quantities of data, is limited. Without adequate Internet access, farmers also have difficulty applying for government programs online”¹

Access to higher speed internet in rural Eastern Ontario opens the door to precision agriculture, which has the potential to vastly shape farming for generations to come. Precision agriculture is a method of farming that uses technological innovations – such as GPS guidance, drones, sensors, soil sampling and precision machinery – to help farmers make more informed, data-driven decisions about their crops. As farming is likely to become more unpredictable as a result of climate change, precision agriculture can help farmers to be as efficient as possible. However, using modern methods is largely dependent on highspeed internet connections, which many Eastern Ontario farmers do not yet have.

¹⁵ Natural Capital Resources, Inc on behalf of the Eastern Ontario Regional Network (EORN). September 26, 2017. “Faster, Further: A Best Practices Review of the Eastern Ontario Regional Network Project”.

¹⁶ Natural Capital Resources, Inc on behalf of the Eastern Ontario Regional Network (EORN). September 26, 2017. “Faster, Further: A Best Practices Review of the Eastern Ontario Regional Network Project”.

¹⁷ Olena Ivus and Matthew Boland, "The Employment and Wage Impact of Broadband Deployment in Canada," Canadian Journal of Economics 48, no. 5 (December 2015): 1803–30.

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At the same time, rural residents experience on average a higher unemployment rates than their urban counterparts¹⁸, which is compounded by job seekers having greater difficulty in accessing online job postings, working productively from home, and accessing necessarily skills training, without an adequate internet connection. To make matters worse, COVID-19 meant that families often had multiple members of the household trying to connect at the same time. For rural residents, this was virtually impossible. Anecdotally, we know that many households coordinated to have one person connected at a time, which significantly impacts productivity, while other families purchased multiple internet packages in the hopes that one provider was reliable at any given time. Compounding this, rural residents who have been traditionally excluded from digital life sometimes lack digital literacy skills and in-demand skills for the digital economy.

At the same time, as work from home becomes more commonplace, reducing the importance of commute times, a larger percentage of people are turning their sights to rural living – provided they can get a high-speed internet connection. Closing the digital divide will mean that rural areas with reliable internet are well poised to attract new residents, new business and new revenue.

Access to Services and Well-Being

As COVID-19 forced virtually all services and social opportunities into the digital realm, the urgency of the disparity between those who had access to services, and those who did not was brought to the forefront of many conversations. Even as the pandemic draws to a close, many services are likely to continue with the virtual models that were developed through the pandemic. Indeed, those virtual service models have the potential to serve rural residents extremely well. In areas with fewer services available and frequent transportation issues, virtual service delivery and online social opportunities for rural residents is both the answer, and the challenge. This will be briefly explored with regards to e-Health, e-learning, municipal e-services, and virtual social opportunities, which significantly impact mental health.

e-Health

Health care services are increasingly and inevitably moving to virtual models. From telehealth to booking COVID vaccine appointments online, to accessing up to date health information, residents without internet access are being increasingly and dangerously being left behind.

As an example, specialist care is almost always located in urban centers. Improved digital equity in rural areas opens the door to immense opportunities for residents to access specialist care, without leaving their home communities (which saves long trips to unfamiliar places and often costly overnight hotel stays). This is particularly impactful for seniors and people with disabilities, who often experience transportation and cost barriers. e-Health has the potential to allow seniors to ‘age in place’, which has been shown to improve quality of life for seniors.

Furthermore, access to the internet provides a source of health information, including staying abreast about public health measures related to the pandemic, but also current information regarding any

¹⁸ Stats Can. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410010601>

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number of health challenges. Access to up-to-date information can help residents to manage their health conditions, make informed choices, and can reduce the overall number of medical appointments that are needed.

Enhancing e-health services for seniors and other community members can take numerous forms. While an internet connection at home that is fast enough to stream video would be ideal (along with having a device and the ability to use said device), it is not the only option. For example, a promising opportunity is for local services providers and community libraries or halls to establish quiet, private rooms with a computer and high-speed connection, which community members can book at no charge for e-health appointments.

e-Learning

The pandemic forced learners to pivot to online learning models virtually overnight. While many students across the board struggled, rural students were particularly disadvantaged. In many households it was simply not possible to access online learning modules, particularly with multiple family members straining limited bandwidth. To make matters worse, the majority of rural libraries were closed, meaning the primary source of free WiFi in the community was not available.

Similar to e-health, e-learning is both a challenge and a solution for rural areas. An internet connection is now essential for young learners to complete their daily educational tasks. As they reach young adulthood, young residents from rural areas frequently leave their home communities to access education opportunities in larger urban centers. e-Learning would support rural and remote residents to access a greater range of learning opportunities from their home communities. This reduces the “brain drain” from rural areas. For adults, e-learning opens the door for workers to upgrade skills through online courses, seminars, virtual conferences, online certification programs and much more. As more and more institutions transition to virtual offerings, e-learning will bring knowledge into rural communities, rather than drawing rural residents out to urban centers.

e-Municipal Services

Access to reliable internet improves opportunities for municipalities to deliver innovative, engaging and cost-effective services. For example, EORN found that municipalities can use internet-based applications to improve service levels, better manage the costs of delivering vital public services, and increase civic participation in local government issues¹⁹. This can include for example, wider and less costly promotion of programs and services, increased and simplified engagement with residents through social media, and virtual public consultations that can be more broadly accessed, for a fraction of the cost. Anecdotally, we know that virtual events related to municipal issues were significantly better attended during COVID than were in person events prior to the pandemic - sometimes by a magnitude of ten. This level of civic participation can only improve our communities.

Virtual social opportunities

Social isolation and loneliness are of primary concern in rural areas, and are significant drivers of mental health and mental well-being. Seniors are particularly impacted by social isolation, which is compound

¹⁹ Eastern Ontario Regional Network. 2015. “Digital Strategy: A Road Map to Digital Leadership (Executive Summary)”.

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immensely when they live in remote areas. In addition, anecdotally we know that under-represented groups, such as LGBTQ youth, transgendered individuals, and visible minority groups speak about high levels of isolation in rural communities. Improved digital equity opens tremendous opportunities for isolated individuals to connect with family, their extended network, faith communities, and other communities of support. In some cases, this can be nothing short of life saving.

Several of the service providers interviewed for this report identified virtual social opportunities as a particularly (and sometimes surprisingly) successful endeavor during the pandemic. While all agreed that virtual social opportunities should never fully replace in person contact, they found that virtual options addressed the common transportation challenge for rural residents, with an added ease of participation that many residents enjoyed (those who were able to connect). Of the service providers interviewed, all indicated that they would continue to provide virtual social opportunities once the restrictions of the pandemic were lifted.

The economic and social benefits of digital equity in rural areas go far beyond what is covered here. The benefits of greater connectivity are incredibly vast, while the costs of digital inequity are increasingly concerning. As stated by EORN, “individuals with new access to broadband may not realize the many ways in which it can be used to improve their lives and prepare them for our changing world”²⁰

Digital Equity in Rural Eastern Ontario: Who are the Players?

Digital equity crosses the boundaries of all levels of government; it is profoundly shaped by the private sector; and it has significant impacts for the not-for-profit sector. The players in rural eastern Ontario are primarily as follows:

Federal Level

The federal government plays a central role in digital equity in two key ways: through regulation and oversight of the telecommunications industry, and through federal spending programs which are central to offsetting the high cost of infrastructure in rural areas. The Government of Canada regulates the industry through the Telecommunications Act, Broadcasting Act, and the Radiocommunications Act. The federal policy agenda is enacted through three key departments:

The Innovation, Science and Economic Development Canada (ISED), which sets standards and approves applications for telecommunication projects. They also supply the [National Broadband Internet Service Availability Map](#), an important tool in digital equity planning (note that the map, while very detailed, relies on ISP-provided speeds, not consumer-reported speeds).

²⁰ Eastern Ontario Regional Network. 2015. “Digital Strategy: A Road Map to Digital Leadership (Executive Summary)”.

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The Canadian Radio-Television and Telecommunications Corporation (CRTC) is mandated by the Minister of Heritage to regulate and supervise broadcasting and telecommunications in the public interest, and it does so at arm’s length from the government. The CRTC regulates the wholesale rates charged by large telephone and cable companies to competitors who want to offer services but depend on having access to these large companies’ networks. The CRTC also sets the standard for minimum internet speeds that residents should ideally have access to (referred to “50/10” service in this report), and sets timeline goals to meet those standards. The CRTC is facing mounting criticism for failing to prevent larger providers from imposing artificially high prices for access to their networks, therefore increasing internet costs for residents and reducing the viability of new projects.²¹.

The Federal government has several programs to improve high speed Internet access for rural Canadians. The **Connect to Innovate** and **Connecting Canadians** programs support backbone infrastructure projects to connect institutions like schools and hospitals, as well as funding for last-mile infrastructure to connect households and businesses. Federal funds have traditionally been the main source of financial support for rural broadband and wireless infrastructure. In particular, the now \$2.75 billion **Universal Broadband Fund** supports high-speed Internet projects in rural and remote communities across Canada.

Canadian Internet Registration Authority (CIRA) is a member-based, non-government, not-for-profit organization, best known for managing the .CA internet domain. Of relevance here, CIRA delivers performancetest.ca, in which Canadians are able to log their true internet speed through internet speed tests. To date, 1,042,776 tests have been run in Canada. This data provides an accurate picture of actual internet speeds in Canada, which is especially relevant in rural areas, and frequently does not match the speeds promised by providers. The data used in the community profiles section of this report was provided by CIRA.

Provincial Level

While provincial governments do not directly regulate telecommunications, several ministries are invested in broadband deployment, including the Ministry of Education, Ministry of Health, Ministry of Agriculture and Rural Affairs, Ministry of Energy and Ministry of Infrastructure. The province coordinates broadband policy and planning initiatives through various departments.

In particular, **the Ministry of Infrastructure (MOI)** is responsible for overseeing investments into built infrastructure including schools, hospitals, roads, bridges, transit, and other critical services that affect people’s daily lives. Part of its mandate has recently been expanded to include broadband and cellular services across the province. Connecting rural, northern, and Indigenous communities has become one of the top priorities in the past two years. The Ministry has announced it will be investing nearly \$1 billion into expanding and improving broadband and cellular access in the province.

²¹ For example, see: <https://nationalpost.com/news/politics/crtc-flip-flop-on-wholesale-internet-rates-could-mean-higher-prices-for-consumers-critics>

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The province is working to address regulatory barriers through the proposed ***Supporting Broadband and Infrastructure Expansion Act***. The legislation would, if passed, aim to reduce the delays and costs associated with accessing hydro utility poles, and would require timely access to municipal right of ways. Addressing these barriers would tangibly improve the digital equity landscape in rural Eastern Ontario.

Hydro One, a local distribution company and crown corporation of the Province of Ontario, owns a significant percentage of the hydro poles in Ontario, which service providers access in order to install fiber for broadband internet. The accessibility of poles, and the capacity of infrastructure to support fiber installation is a significant factor in connectivity projects.

Regional & Local Level

Connectivity is not considered a core municipal service, and so municipal governments do not have a mandated, regulatory or oversight role in telecommunications. However, they are the level of government that is closest to students, families, businesses, and seniors, who are demanding better connectivity, and so many municipalities have a high level of interest in connectivity. As a result, municipal governments can and do play an important role in initiating digital equity projects.

Municipal projects can range from free WiFi hotspots, digital literacy programs, advocacy work, right up to funding projects (eg. one municipality has done so through a Municipal Levy), securing funding for multi-million-dollar infrastructure, and even building and operating their own high-speed networks. For more information, see pages 16 to 21.

Eastern Ontario Wardens' Caucus and **Eastern Ontario Mayors' Caucus**. The Caucuses advocate for eastern Ontario's rural areas. Although they are not focused exclusively on internet access, connectivity has been a primary concern for many years. In particular, the Caucuses recognized that a regional approach was required to address the broadband gaps, and created the highly regarded Eastern Ontario Regional Network (EORN) to undertake that work.

Eastern Ontario Regional Network (EORN). EORN is a non-profit regional network that aims to improve telecommunications across Eastern Ontario. Between 2010 and 2015, EORN built a \$175-million network that improved broadband access to about 90% of Eastern Ontario. EORN is currently undertaking a study to assess connectivity gaps. EORN's latest initiative, **the Gig Project**, aims to significantly improve download and upload speeds to 95% of the homes and businesses in the region through ultra-high-speed internet. The project is currently seeking support from various stakeholders.

Private sector. The largest player in the private sector is the **Internet Service Providers (ISPs)**. There are a wide range of ISPs operating in rural Eastern Ontario, from smaller local operators, such as **Community Fiber** in Lanark, to giants such as Bell and Starlink. As connectivity has primarily fallen to the private sector, ISPs play an immense role in the digital equity landscape. Eastern Ontario has dozens of ISPs; however, any given address may only have a handful of providers offering service to their particular home. As a result, consumers, particularly those in more remote areas, do not have the same range of choice when it comes to providers, as compared to their urban counterparts. The services provided, from fixed wireless technology to fiber optic broadband to low orbit satellite, also vary greatly.

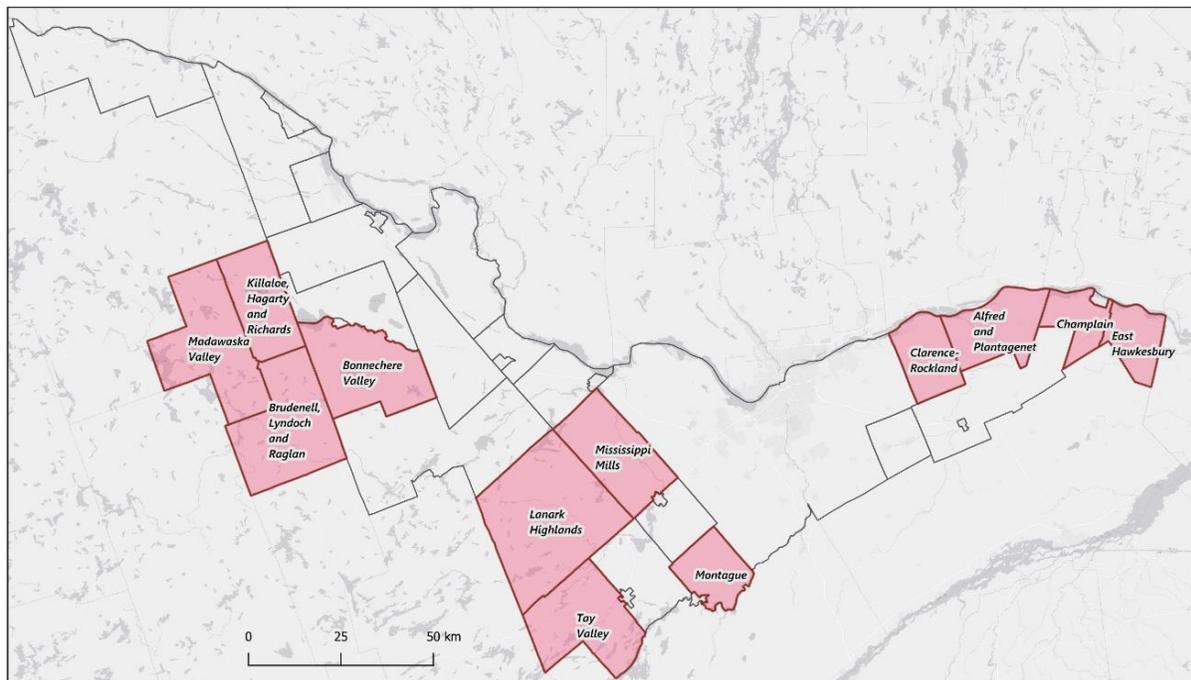
Local agencies and community groups. Local players, such as libraries, health and resource agencies, and community groups are also significantly shaping the digital equity landscape. For example, **MM2020** is a group of local volunteers who have been working to expand broadband access to areas in Mississippi Mills, with support from Council. They currently have various pilot projects within Mississippi Mills.

Public libraries are currently the main (often only) provider of free public WiFi in rural Eastern Ontario communities. **Community groups and the not-for-profit sector** are central to the provision of digital literacy and training, accessible devices, shared or mobile hotspots, and tech support initiatives, which impact those most in need. More information on initiatives being undertaken by local players can be found throughout this report.

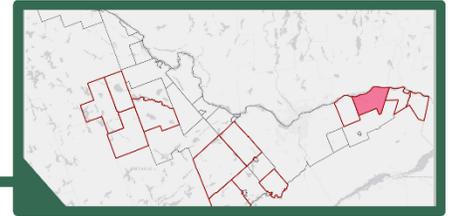
Digital Equity Profiles of Twelve Priority Communities

This section of the report provides **digital equity profiles of 12 communities in rural Eastern Ontario**. The 12 communities selected fall within United Way East Ontario’s boundaries, and reflect a range of areas, with diverse and unique needs. They were selected based on socio-economic conditions which put them at risk of digital inequity, and a high potential for gains to be made through local, targeted investments and initiatives. In addition, **a strategy, or path forward, for advancing digital equity initiatives in the twelve communities is proposed**. For more detail see also the interactive mapping portal at <https://www.arcgis.com/apps/dashboards/3116c95322e34743a6b3ea3826e51f42>

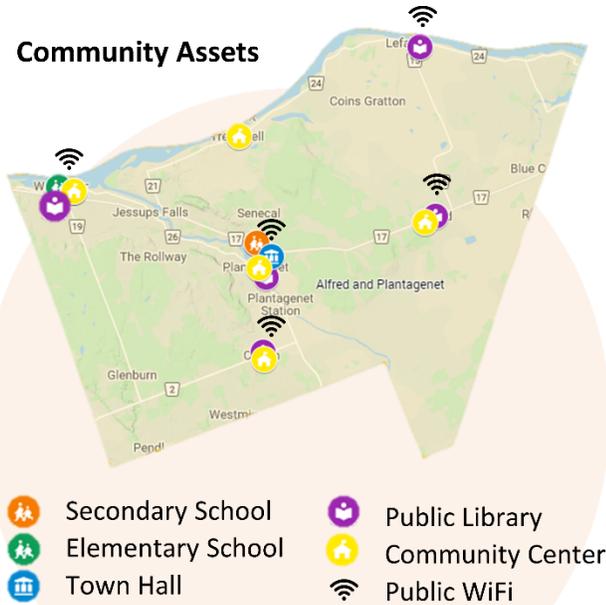
The twelve priority areas included in this report:



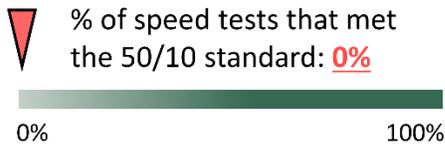
Digital Equity in the Community: Alfred and Plantagenet



Community Assets



View live map:
<https://tinyurl.com/zij28nje>



Community Highlights & Considerations

- The community has 5 branches of the public library, all of which offer public internet access, computer access and free public WiFi (closed during COVID).
- The town hall and community centers are potential future sites for free public WiFi.
- Overall rates of low income and unemployment are lower than average for Ontario. But, there are areas where 25% of all residents and over 21% of seniors live below the poverty line.

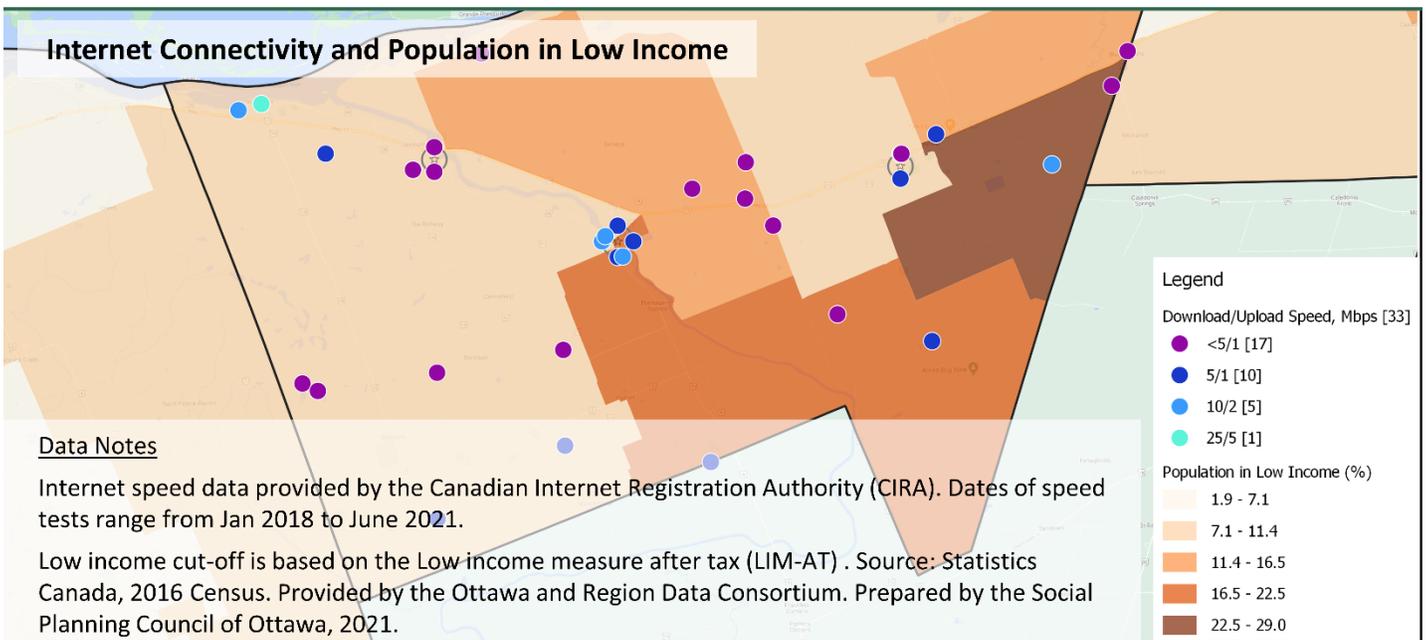
Internet Speeds in Alfred and Plantagenet



Actual average speeds in 2021

Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)

Internet Connectivity and Population in Low Income

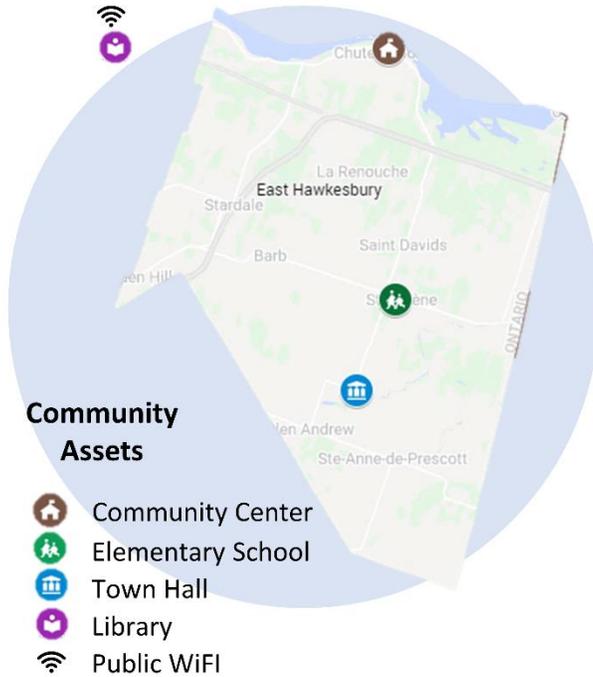
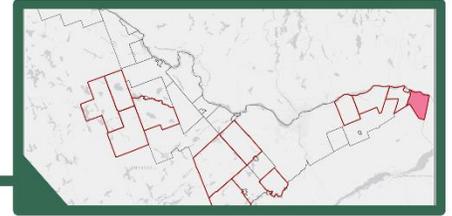


Data Notes

Internet speed data provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Low income cut-off is based on the Low income measure after tax (LIM-AT). Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: East Hawkesbury

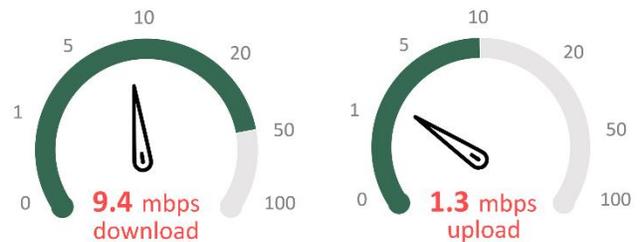


View live map:
<https://tinyurl.com/zjy28nje>

Community Highlights, Opportunities & Considerations

- There is no public WiFi directly in the community.
- There is no library in the community, but residents have access to the nearby Hawkesbury library (which does offer free public WiFi).
- The town hall, and/or local elementary school could be ideal future sites for free public WiFi.
- East Hawkesbury has the smallest population density of all Prescott and Russell municipalities.
- 1 in 5 local residents is a senior. Over 37% of households are families with children. Children aged 0 to 19 make over 19% of the population.
- The overall rates of low income and unemployment are close to average for Ontario, but in parts, low income reaches 18% of residents and 24% of seniors.

Internet Speeds in East Hawkesbury

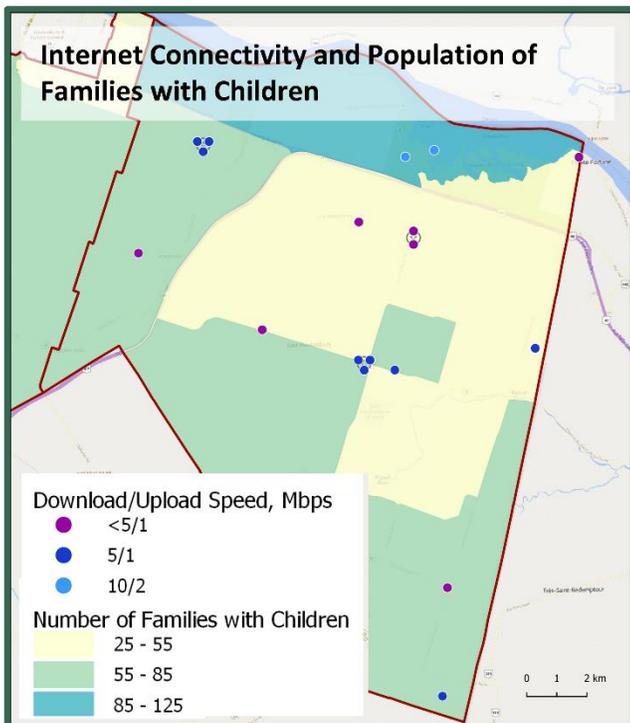


Actual average speeds in 2021

Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)

% of speed tests that met the 50/10 standard: **0%**

0% 100%

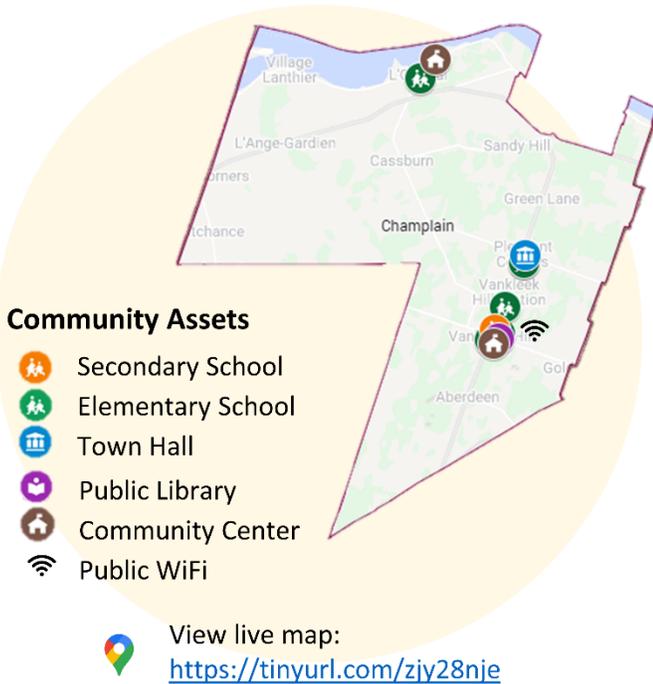
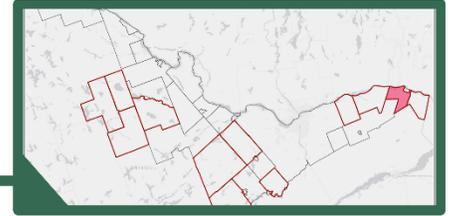


Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

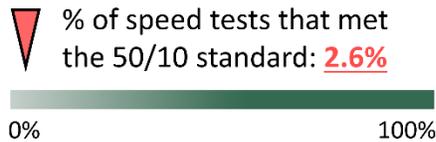
Families with Children. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Champlain



Community Highlights & Considerations

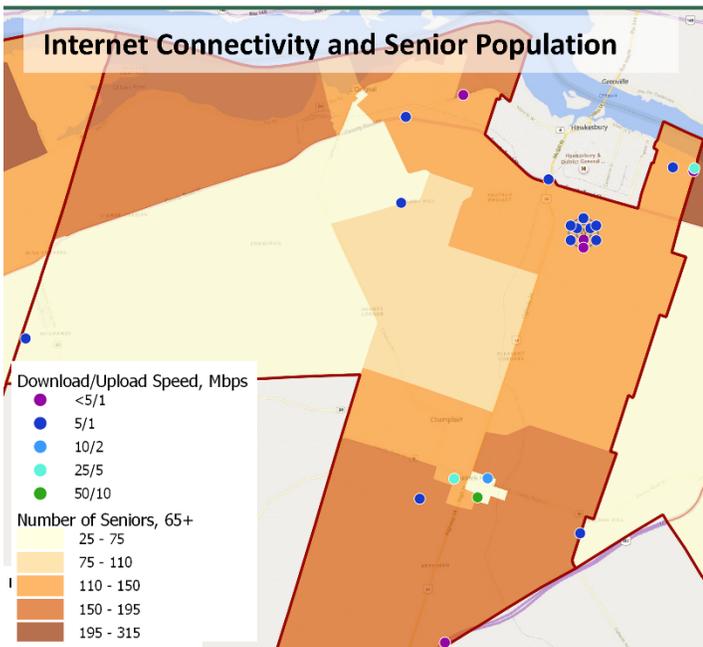
- The community has one library and two community centers.
- Public computers and free WiFi are available at the library (closed during COVID-19).
- Virtual Computer Education Sessions are offered for free to seniors weekly through one-on-one sessions to answer basic questions using email, computers and other devices.
- Close to one quarter of local population is over the age of 65. Champlain has comparatively low rates of low income and unemployment. At the same time, the percentage of seniors in low income is higher than average for Ontario.



Internet Speeds in Champlain



- Actual average speeds in 2021**
- Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)

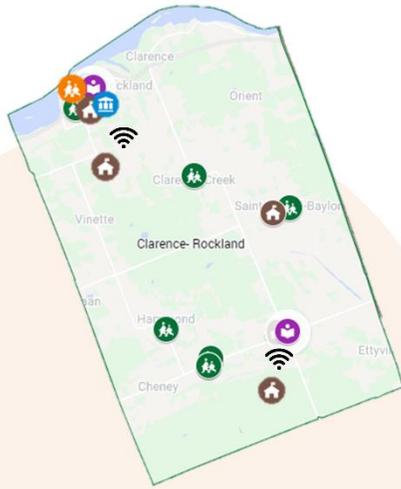
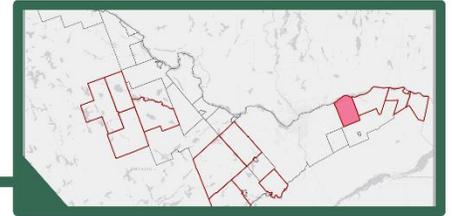


Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Senior population. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Clarence-Rockland



Community Assets

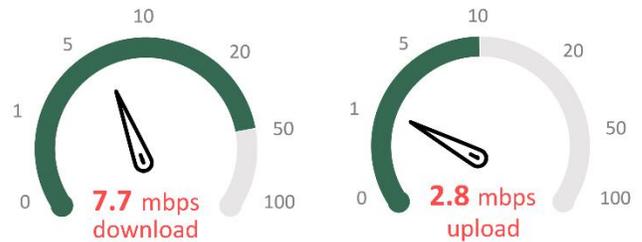
-  Secondary School
-  Public Library
-  Elementary School
-  Community Center
-  Town Hall
-  Public WiFi

View live map: <https://tinyurl.com/zjy28nje>

Community Highlights & Considerations

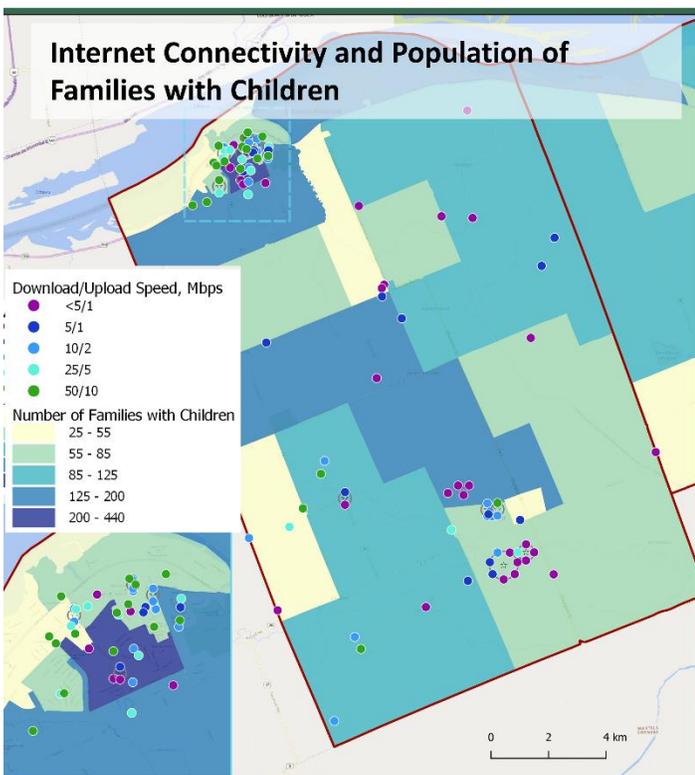
- The community has 4 community centers, and two branches of the public library (Rockland and Bourget). Both branches of the library offer computers with highspeed internet and software, as well as free public WiFi.
- There is free WiFi at several businesses in Rockland.
- Clarence-Rockland has the largest total population compared to all Eastern Ontario townships.
- Over 45% of households are families with children, one of the highest proportions across all rural and urban places in the region.
- Clarence-Rockland has one of the smallest percentages of unemployment and low income in Eastern Ontario, including Ottawa. Nevertheless, due to relatively large population, the number of vulnerable residents in is comparatively high.

Internet Speeds in Clarence-Rockland



-  **Actual average speeds in 2021**
-  Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)

 % of speed tests that met the 50/10 standard: **9.2%**

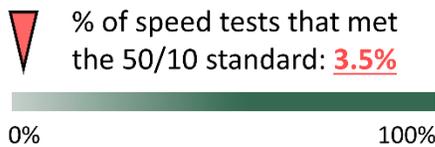
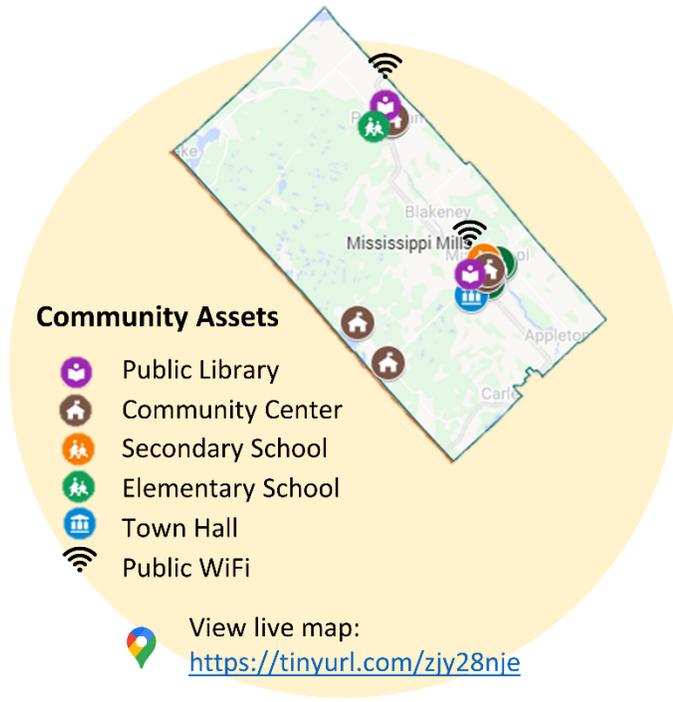
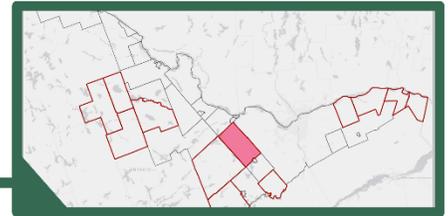


Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Families with Children. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

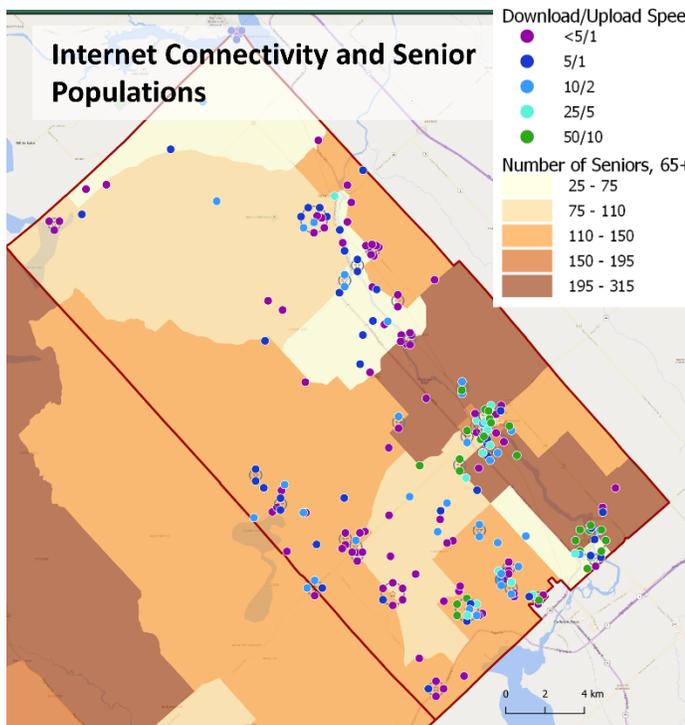
Digital Equity in the Community: Mississippi Mills



Community Highlights & Considerations

- The libraries in both Almonte and Pakenham have boosted their internet signals in order to provide the public with free WiFi outside the building -- a significant asset during COVID.
- The Library in Almonte is also providing free tech assistance, Chromebooks, digital literacy programming and mobile hot spots which residents can borrow for the week.
- Relatively large in population, Mississippi Mills has a high number of seniors -- 1 in 5 of local residents is a senior. Children 18 years and younger make 21% of the population.
- The number of seniors, lone parent families, and people with disability who live below the poverty line is bigger than in most of the Eastern Ontario townships.
- At the same time, the rates of unemployment and low income in Mississippi Mills are of the lowest compared to EO townships and Ottawa.

Internet Speeds in Mississippi Mills

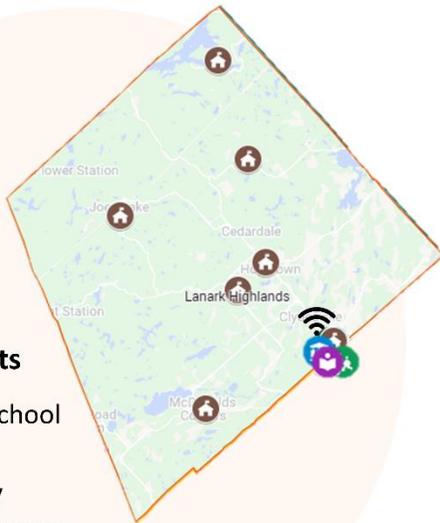
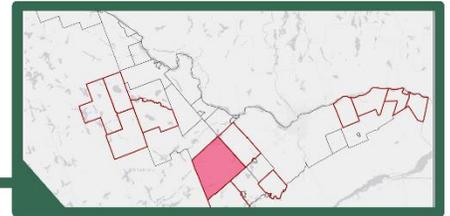


Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Senior population. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by: the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Lanark Highlands



Community Assets

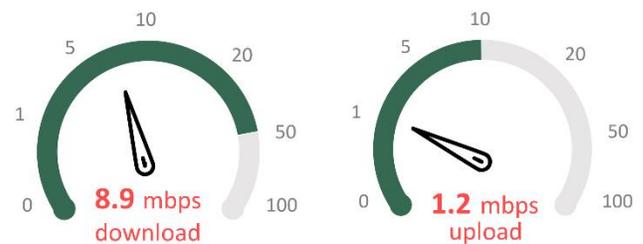
- Elementary School
- Town Hall
- Public Library
- Community Center
- Public WiFi

View live map: <https://tinyurl.com/zjy28nje>

Community Highlights, Opportunities & Considerations

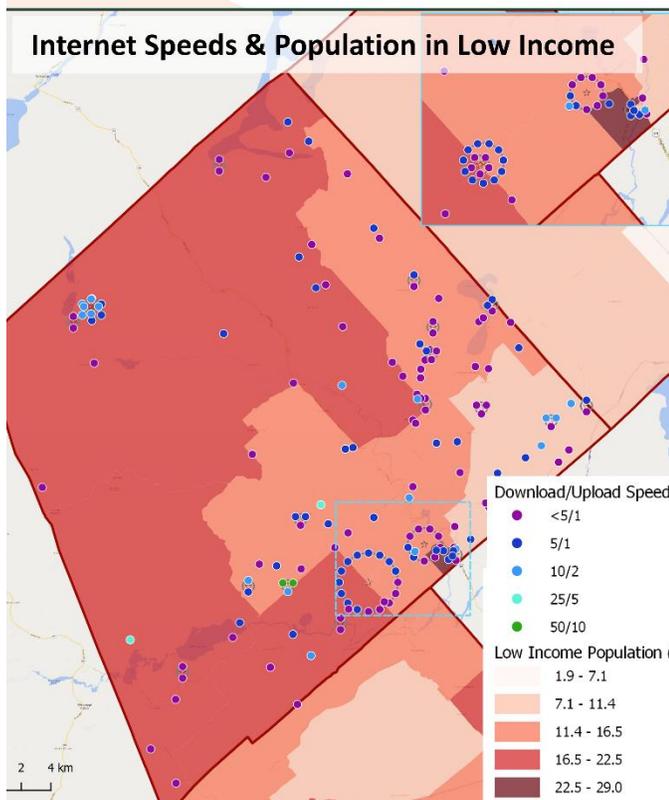
- The community has an impressive 7 community centers. They are well distributed through the region (potentially ideal for future WiFi sites).
- There is currently free WiFi available at 1 local restaurant, and at the 1 public library (next door).
- The township has the smallest population density of Lanark County municipalities, and the highest rate of low income (16.2%).
- Seniors are 22% of all residents.
- In parts of the township, the low income rate of all residents reaches 26%, and 21% for seniors.

Internet Speeds in Lanark Highlands



Actual average speeds in 2021
 Minimum target speeds as per CRTC (50 mbps download & 10 mbps upload)

% of speed tests that met the 50/10 standard: **1.1%**
 0% 100%



- Download/Upload Speed, Mbps
- <5/1
 - 5/1
 - 10/2
 - 25/5
 - 50/10
- Low Income Population (%)
- 1.9 - 7.1
 - 7.1 - 11.4
 - 11.4 - 16.5
 - 16.5 - 22.5
 - 22.5 - 29.0

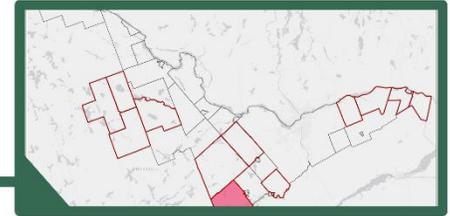
Data Notes

Internet speed data provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

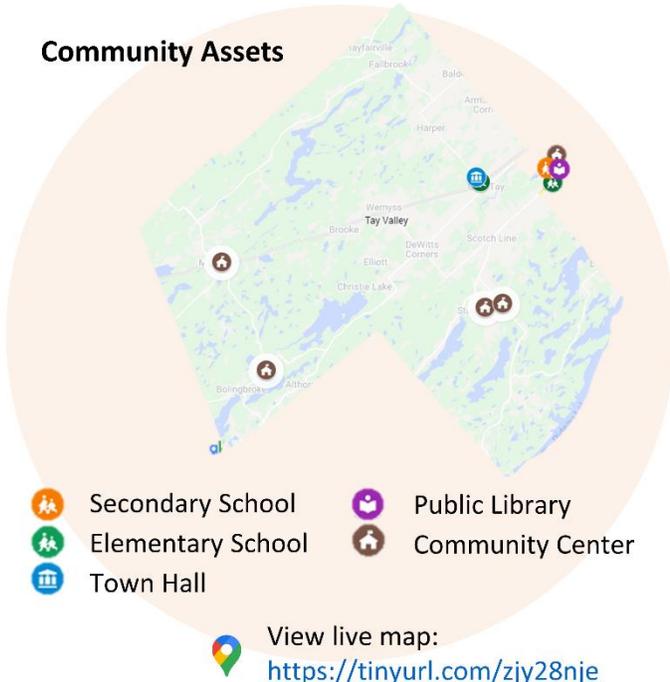
Low income cut-off is based on the Low income measure after tax (LIM-AT)

Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Tay Valley

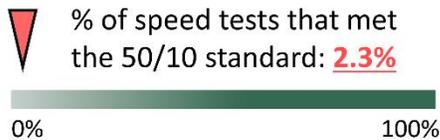


Community Assets

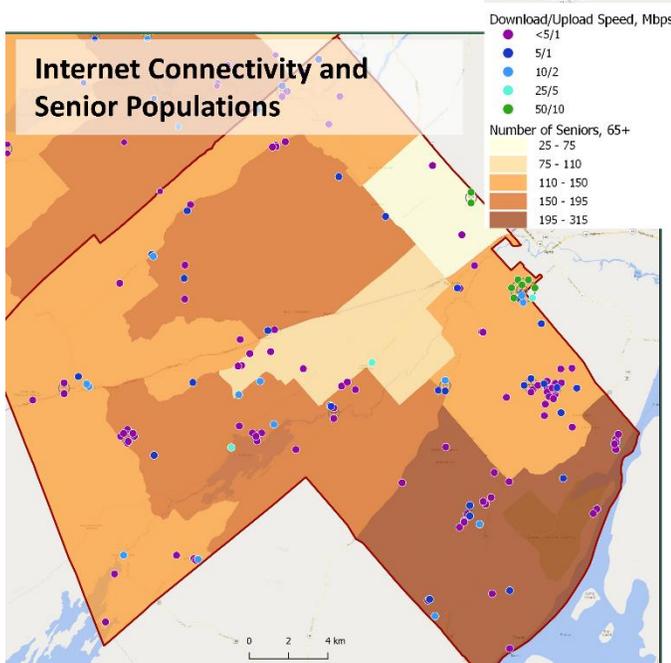
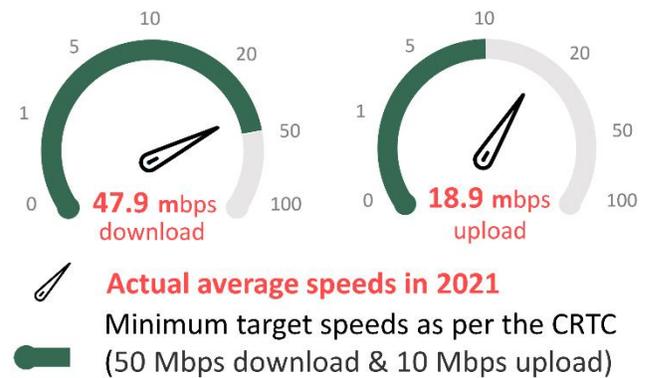


Community Highlights & Considerations

- The community has four community centers.
- There are no libraries in the community, but there is a library in nearby Perth.
- There is no free WiFi in Tay Valley. The community centers and town hall would be potential options for future WiFi sites, and they are fairly well distributed across the community.
- Internet speeds in Tay Valley were higher than other rural areas, but the locations with highest speeds were in very close proximity to Perth.
- The proportion of senior population in Tay Valley is one of the highest among rural municipalities: 27.5% of local residents are over 65 years of age.
- The overall rate of low income (11.2%) in Tay Valley is lower than in Ottawa and Ontario. In parts of the township however, 18% of all residents and 25% of seniors live below the poverty line.



Internet Speeds in Tay Valley

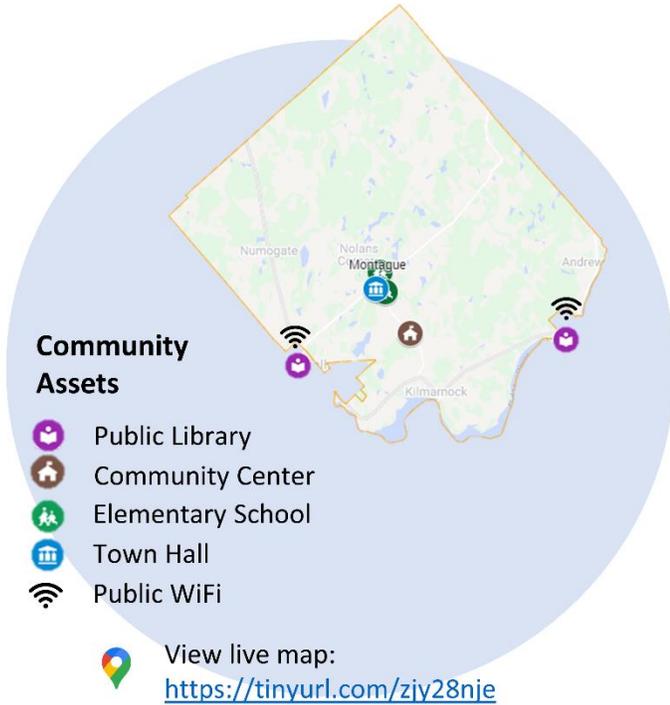
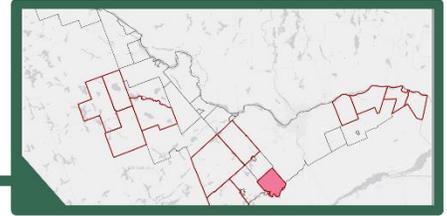


Data Notes

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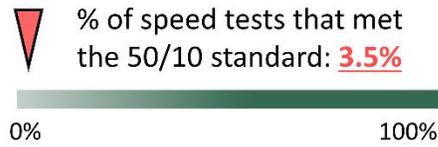
Senior population. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Montague



Community Highlights & Considerations

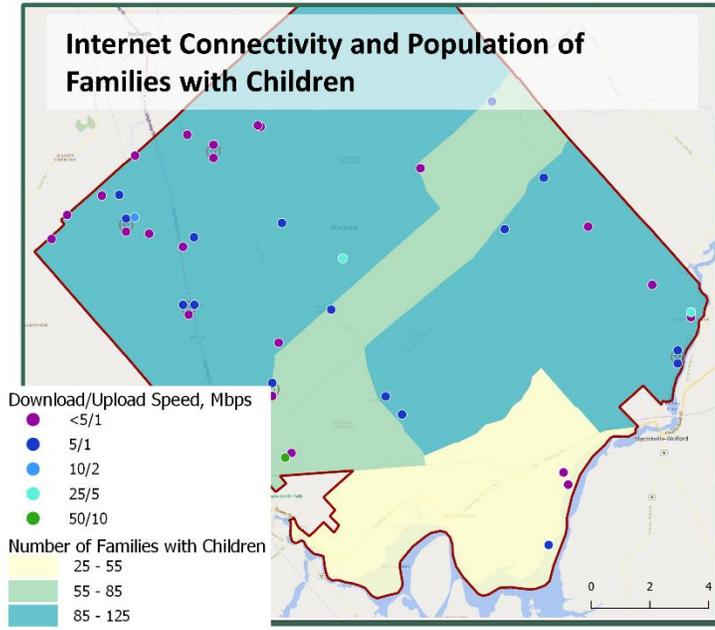
- There is no public WiFi in Montague. The townhall or community hall could be potential future sites for free public WiFi for residents.
- There are no libraries in the community, but two located nearby (Smith Falls and Merrickville), which do offer public WiFi (closed during COVID).
- The overall rate of low income (12.1%) in Montague is lower than in Ottawa and Ontario. In parts of the township, however, 21% of all residents live below the poverty line.
- Children 18 years and under make up 23% of all residents. Over 43% of households are families with children.



Internet Speeds in Montague



- Actual average speeds in 2021**
- Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)

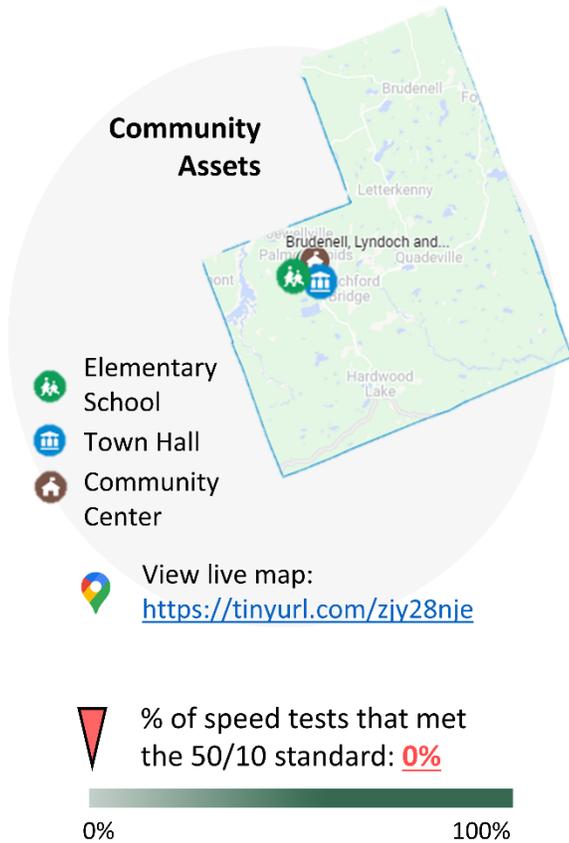
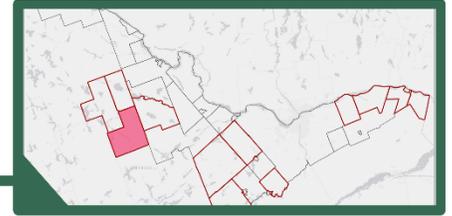


Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Families with Children. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by the Social Planning Council of Ottawa, 2021.

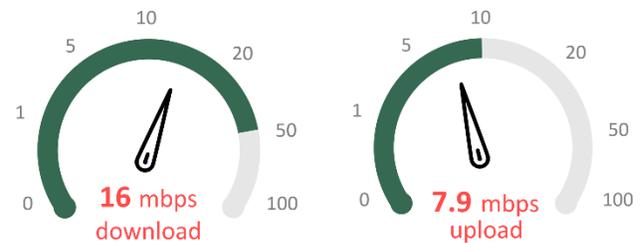
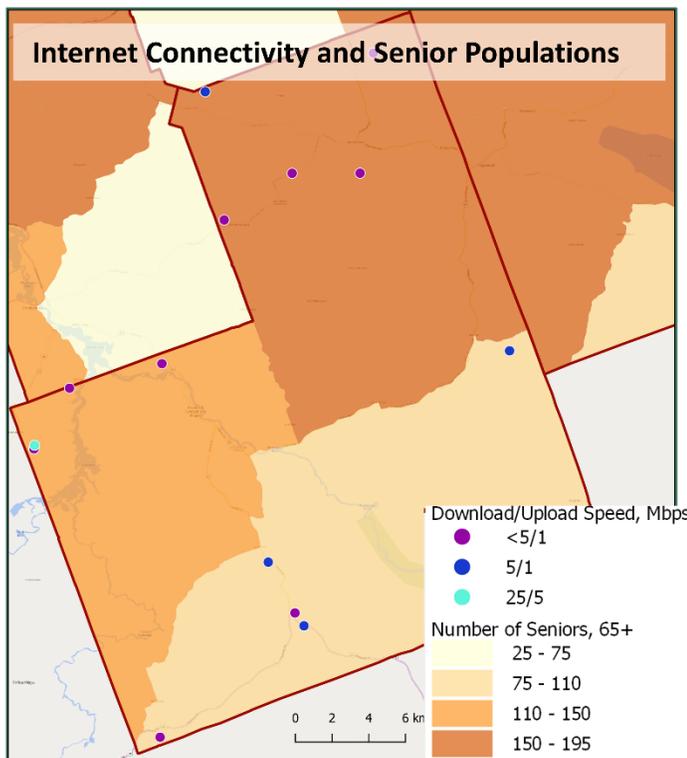
Digital Equity in the Community: Brudenell, Lyndoch and Raglan



Community Highlights & Considerations

- The community has a community center but no public library.
- There is no public WiFi available. The townhall or community center could be potential sites for future public WiFi projects. There is also a low number of speed tests for the area – additional data gathering would be beneficial in order to track progress.
- The township has the smallest population density of all Eastern Ontario municipalities (2.1 people per sq.km.).
- 1 in 4 of local residents is a senior (26.6%).
- The unemployment (10.9%) and low income rates (21.3%) are second to highest amongst all rural townships in EO. The low income rate is especially high for seniors: 29.6% of seniors live below the poverty line.
- BLR has the highest proportion of population with disabilities: 20.3% of township residents experience limitations in their activity on a daily basis.

Internet Speeds in Brudenell, Lyndoch and Raglan



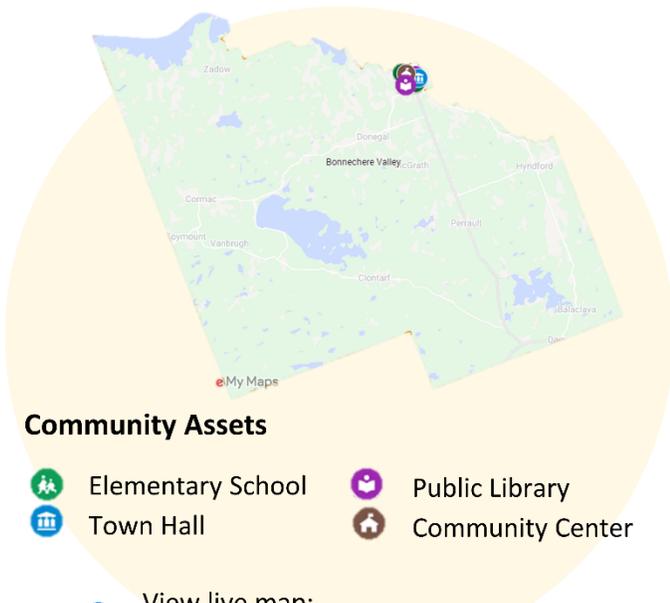
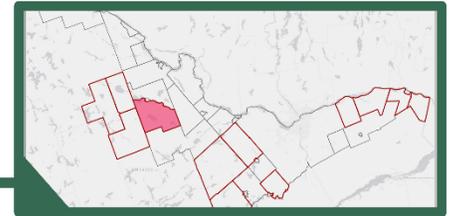
- Actual average speeds in 2021**
- Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)

Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Senior population. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by: the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Bonnechere Valley

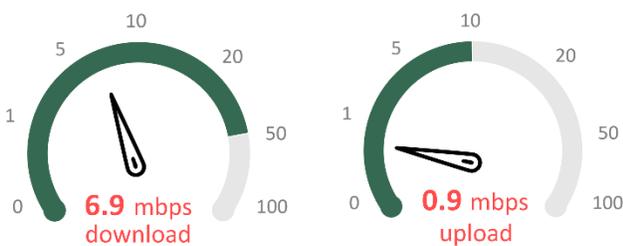


Community Assets

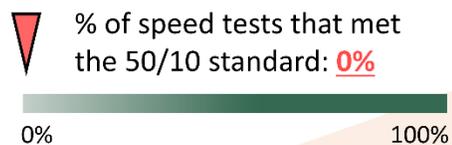
-  Elementary School
-  Public Library
-  Town Hall
-  Community Center

View live map: <https://tinyurl.com/zij28nje>

Internet Speeds in the Bonnechere Valley



-  **Actual average speeds in 2021**
-  Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)



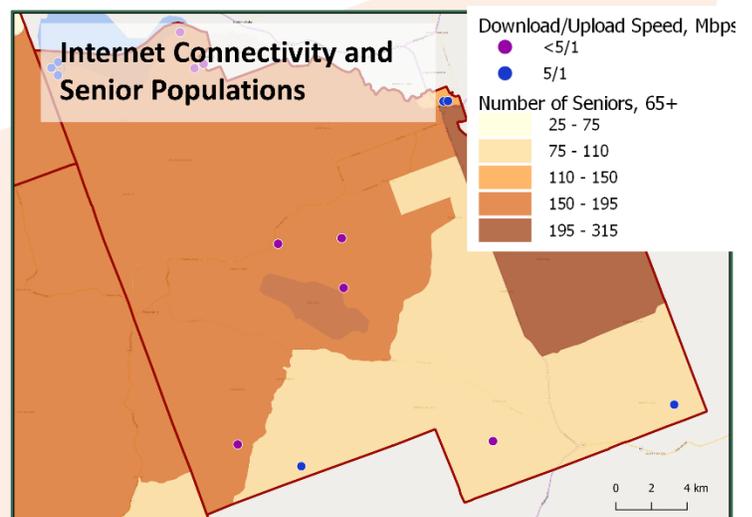
Community Highlights & Considerations

- The community has one library and one community center, both located in Eganville.
- The library offers free public WiFi. As well, they have a “makerspace” focusing on digital technology, including a MacBook, iPad, video and photography equipment for in-house use.
- The library also offers free basic tech support for residents. This includes assistance with home computers and other devices, such as using email, software, social media and other basic functions.
- Bonnechere Valley has a low population density, and a relatively high percentage of local residents are seniors (27.1%).
- The unemployment rate (10.5%) is higher than the provincial average (7.4%).
- 18.5% of the local population and 20.4% of seniors live below the poverty line, a much higher proportions than average.
- A high percentage of Bonnechere Valley township residents (17.7%) are living with disabilities.

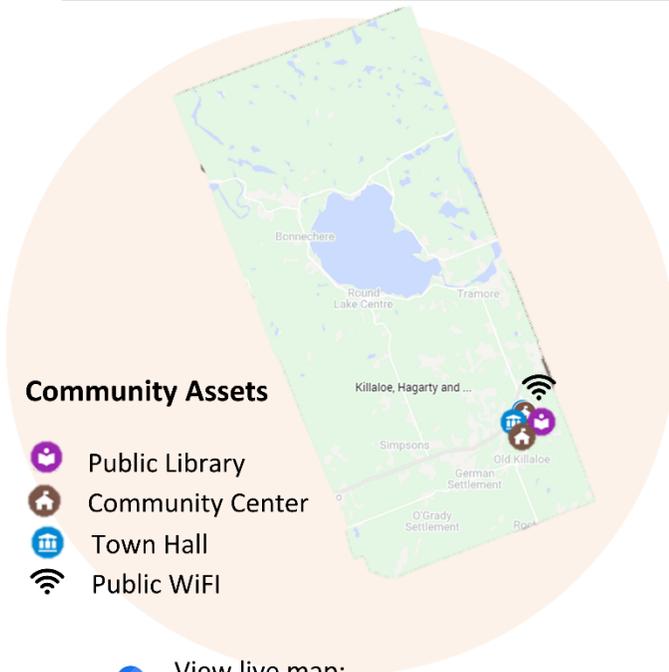
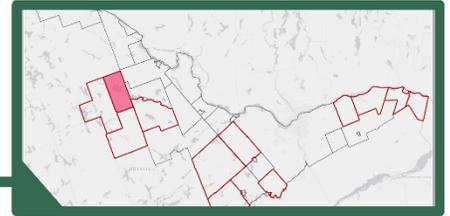
Data Notes

Internet speed data is provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Senior population. Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by: the Social Planning Council of Ottawa, 2021.



Digital Equity in the Community: Killaloe, Hagarty and Richards



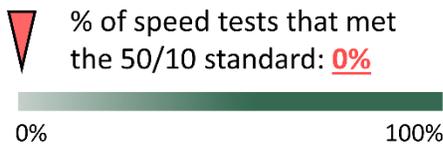
Community Assets

- Public Library
- Community Center
- Town Hall
- Public WiFi

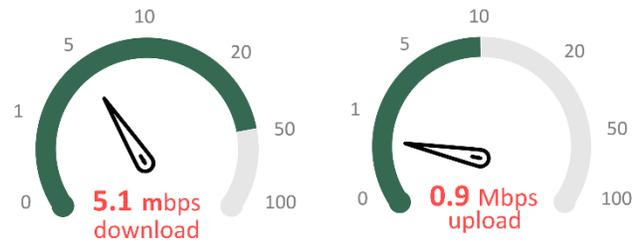
View live map: <https://tinyurl.com/zjy28nje>

Community Highlights, Opportunities & Considerations

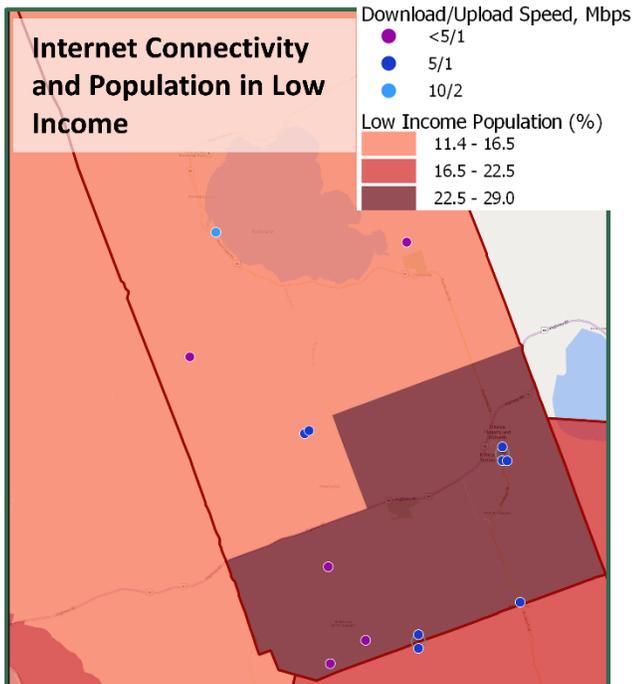
- The community has one library and two community centers. Its public buildings are concentrated in the Killaloe area.
- The Killaloe Library offers computer access as well as free WiFi. (closed during COVID).
- The township has one of the smallest population density in the area (6.1 people per sq. km.).
- 24.6% of local residents are seniors.
- The low income rate (21.4%) is the highest among the rural townships in Eastern Ontario. The rate of low income is particularly high for seniors: 25.4% live below the poverty line.
- In parts of the township, the low income rate of all residents soars to 29%, and to 39% for seniors.



Internet Speeds in Killaloe, Hagarty and Richards



- Actual average speeds in 2021**
- Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)**



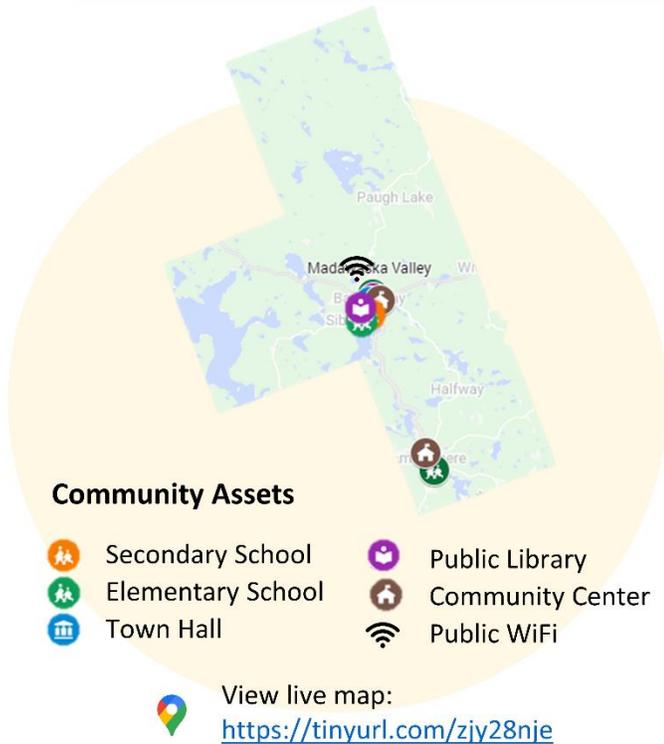
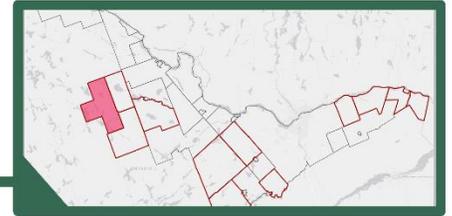
Data Notes

Internet speed data provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Low income cut-off is based on the Low income measure after tax (LIM-AT)

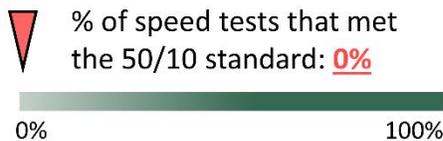
Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by: the Social Planning Council of Ottawa, 2021.

Digital Equity in the Community: Madawaska Valley

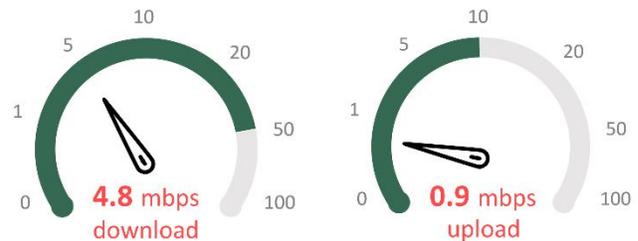


Community Highlights, Opportunities & Considerations

- The community has one library and two community centers. The library offers free public WiFi.
- The Combermere Community Centre could be an ideal future site for public WiFi in the future, as it would serve residents to the south.
- The Madawaska Valley township has one of the smallest population density in the area (6.1 people per sq. km.).
- The township has a large proportion of seniors (31.3%).
- The unemployment (11.4%) and low income rates (17.4%) are among the highest in rural townships in EO. The rate of low income is particularly high for seniors: 21.1% live below the poverty line.
- A high percentage of Madawaska Valley township residents live with disabilities (19.3%).

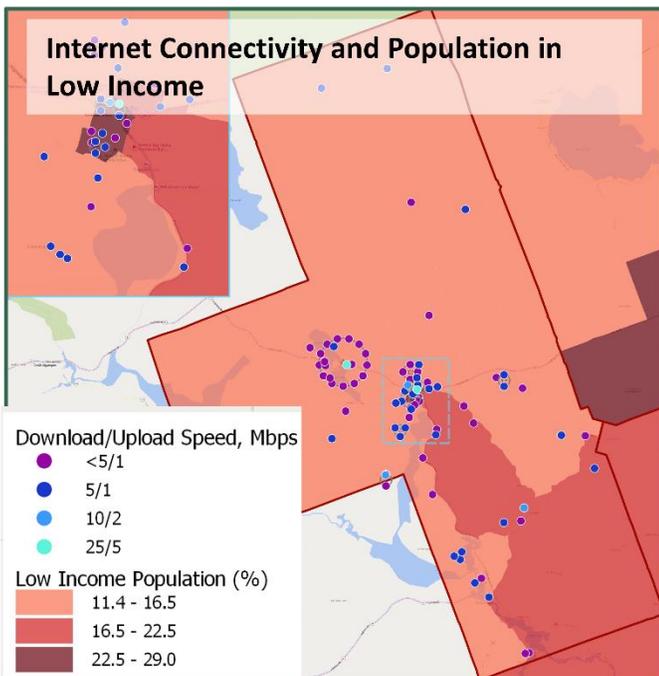


Internet Speeds in Madawaska Valley



Actual average speeds in 2021

Minimum target speeds as per the CRTC (50 Mbps download & 10 Mbps upload)



Data Notes

Internet speed data provided by the Canadian Internet Registration Authority (CIRA). Dates of speed tests range from Jan 2018 to June 2021.

Low income cut-off is based on the Low income measure after tax (LIM-AT)

Source: Statistics Canada, 2016 Census. Provided by the Ottawa and Region Data Consortium. Prepared by: the Social Planning Council of Ottawa, 2021.

What can be done to Improve Digital Equity in Rural Eastern Ontario?

What’s Being Done in Eastern Ontario and Elsewhere?

The lack of reliable, high speed internet in rural areas reflects a classic case of market failure. While the demand is high, there is simply not a business case to be made by the private sector, particularly when acting alone, to justify the high cost of infrastructure. This is particularly the case in more remote areas and in lower income areas. Yet, as has been presented here, digital access is no longer a luxury - it is centrally and critically important to virtually every aspect of our lives. Where does that leave us?

There is no one size fits all option for local communities. Luckily, there are a wide range of options that local communities and other players can explore, many of which have been implemented in other jurisdictions, providing a wealth of information and best practices to consider.

Below is a sample of options and initiatives that are available to local communities, presented across a spectrum of involvement. The options are not mutually exclusive. We propose that regardless of the top tier option that is chosen, the three lower components will also be important, in order for connectivity benefits to be shared across the community equitably. Most likely, communities will require a range of options to adequately address the digital equity needs of all residents.

✔ **BEST PRACTICE:**
Start small with pilot projects in order to better understand the technology, community receptiveness and outcomes. Then, scale up when big opportunities present themselves.

✔ **BEST PRACTICE**

A valuable first step for rural municipalities and community groups would be to first conduct a digital audit in order to better understand their current situation, and to identify the most effective route forward. This can include municipal assets and current gaps in connectivity. Having a baseline also allows progress to be tracked more accurately over time.

It is however worth noting that data is lacking on a host of variables which impact digital equity - including, for example, the relatively small number of speed tests from rural areas included in CIRA’s Performance Test assessments. Gathering additional data will ensure that programs and policies that are undertaken are evidence-based. One example of using data is the **Broadband & Associated Infrastructure Mapping Analysis Project (BAIMAP)** in Northern Ontario, which is a GIS application developed by Blue Sky Net to access broadband infrastructure data for Northern Ontario down to the property parcel level.

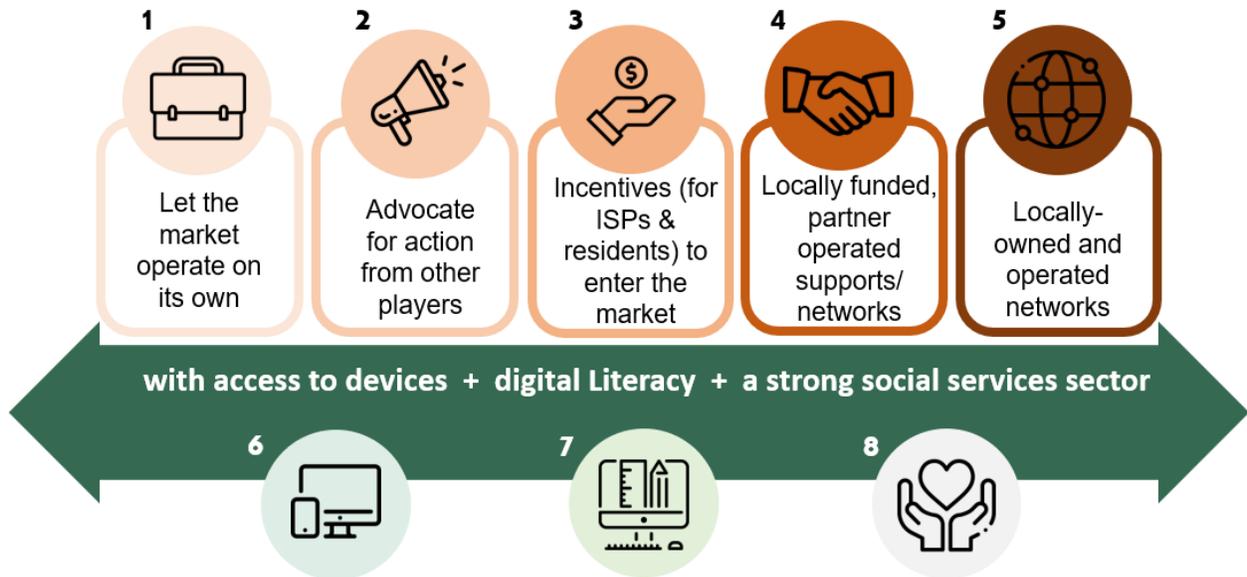
As part of this report, we have developed an initial inter-active GIS mapping project on rural Eastern Ontario, to assist with planning. It identifies populations of interest with respect to digital equity, the Internet Performance Tests from CIRA and some community assets that could be used to support digital equity – such as local libraries.

The community profiles in this report reflect a small sample of the mapping portal. Visit <https://www.arcgis.com/apps/dashboards/3116c95322e34743a6b3ea3826e51f42>

Pathways to better connectivity in rural areas²²

²² Brundell, Erin, 2020. Presenting at AMO conference “The Undeniable Need for Broadband Connectivity in a Pandemic and Post-Pandemic World”

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Adapted from Erin Britnell, 2020

- 1** **Let the market operate on its own.** On one end of the spectrum is the option to not intervene, and allow the market to operate on its own. This is largely what exists in many communities today. However, in the rural context this reflects a market failure to meet the needs of residents, and is not recommended.
- 2** **Advocate for action from other players.** Local and municipal players are not necessarily the primary players on the digital equity scene. One way to enact change is to use local resources to pressure high levels of government and other players to act in the interest of local communities.

For example, the Wardens' Caucuses galvanized support around rural connectivity and developed economies of scale through the **Southwestern Integrated Fiber Technology (SWIFT) and the Eastern Ontario Regional Network (EORN)**. In Eastern Ontario, municipalities can partner with EORN to access resources and advocate for their needs. Municipalities can also join the **Association of Municipalities of Ontario (AMO)**, the **Rural Ontario Municipal Association (ROMA)** and/or the **Federation of Canadian Municipalities (FCM)** to participate in ongoing advocacy initiatives. Federal and provincial governments can be lobbied to enhance funding and enact policy change that reflects the needs of rural residents.
- 3** **Incentives (for ISPs & residents) to enter the market.** The traditional model for digital equity in rural areas has consisted primarily of funding from the public sector to incentivize telecommunications service provider (TSPs) and internet service providers (ISPs) to build in areas where infrastructure has been stalled, or was not otherwise viable. In short, these are subsidies operating in the private sector market model.

For example, rural Perth County in South Western Ontario received support from the federal and provincial governments (\$1.8 million each) to develop a modern broadband network. The Projects will

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collectively service 194 km of underserved roadway to bring better broadband connectivity to 869 households and businesses. Construction is underway and service is expected in March 2022. The municipality worked with **Southwestern Integrated Fiber Technology (SWIFT)** -- comparable to EORN for Eastern Ontario -- to award contracts to three private sector service providers.²³ Many similar projects exist across the region.

A potentially smaller scale approach under this heading would be to use local-level subsidies to incentivize residents to increase market uptake. This is primarily used in cases where a hookup is possible, but the cost of the initial install is prohibitive.

An example of this is Lanark County's new **Help Families Get Connected** program which helps medium and lower income residents²⁴ by offsetting the install cost of high-speed internet by up to \$2000. Funding can be used for towers, satellite dishes and/or wiring for reliable internet, but is not meant for ongoing internet costs. The homeowner applies for the subsidy, which is paid directly to the Internet Service Provider.

4



Locally funded, partner operated supports and networks. This includes municipalities and other local players directly funding projects (including using their resources to leverage additional funds). Projects could include broadband infrastructure, or other connectivity projects that benefit residents. These networks are still owned and operated by the private sector.

An example of this is the **Waterloo Region Education and Public Network (WREPNet)**. WREPNet is an alliance of the school boards, local governments, public libraries and the local community college. Each partner shared in the cost of building the network. Initiated in 1999, WREPNET uses dark fiber (already installed but not in use fiber optics) technology to connect MUSH (municipalities, universities, schools and hospitals) sector entities. Students and library patrons, as well as municipal staff have access to the network, and WREPNET was the first school board in the province to achieve 1 gig per school network capacity. It is also a backbone for other wireless technologies.

An innovative example of how to fund such a project can be found in the rural town of Caledon Ontario. The municipal council in Caledon passed a motion to approve the creation of an **annual broadband tax levy**. The levy costs residents between \$10-20 on their municipal tax bill (depending on property value) and generates approximately \$300,000 per year into a reserve, which the town uses for broadband internet projects. For example, the town was recently able to use their levy to award Vianet a contract to build 8.2km of fiber-optic trunk cable in the Industrial Park in Caledon and to build a 35 km backbone along the Caledon Trailway.

5



Municipally-owned and operated networks. The most direct involvement local players can have would be to build and operate their own networks. This reflects a public utility model, similar to the provision of other basic necessities, such as electricity. While costly, there are currently many examples of local communities that have been able to successfully build and operate their own networks for the benefit of residents. Examples include:

²³ Ontario Newsroom March 16, 2021 "Expanding Access to Broadband in Perth County".

²⁴ Eligible residents reside in Lanark County with a household income under \$70,000, asset value of less than \$200,000 and primary residence value of less than \$354,442.

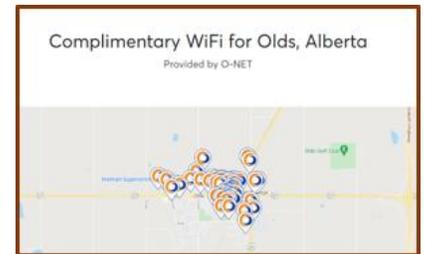
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YorkNet: Incorporated in 2017, YorkNet is a region-owned corporation that plans, builds, operates, manages and maintains a high-speed, dark-fiber network across York Region. YorkNet includes a rural component, but is not exclusively rural. The Network connects a variety of regional buildings and assets, including traffic control, transit, social housing units, water-quality monitoring systems, hospitals, local municipal operations, libraries and police services.

Niagara Regional Broadband Network (NRBN). NRBN is municipally owned by Niagara Falls and Niagara on the Lake, and includes both urban and rural components. The Network provides internet to community members, businesses and schools through an ultra-reliable fiber optic network with “near limitless speeds and capacity”²⁵

The rural **town of Pictou**, Nova Scotia has also committed to a “built by us, for us” broadband network. The network will be 100% constructed, operated, and maintained by the municipality of Pictou County and a consortium of private companies. The network is expected to meet or exceed the CRTC’s standards for service quality, and revenues will remain in the community.

O-Net (Olds Alberta). Launched in 2013 in Olds Alberta (population 8,500), O-Net is Canada’s first community owned operator. It claims to provide Canada’s fastest internet, with gigabit-per-second access for every resident in the community. Also notable are an impressive array of free public WiFi sites (map provided).



Public WiFi available in Olds, Alberta

Smaller scale, yet highly impactful, municipal projects include initiatives to offer free WiFi to residents, such as through local libraries. For example:

Mississippi Mills Public Library in Almonte. When the pandemic hit, the library staff were concerned that patrons would no longer be able to access public WiFi, which is particularly essential when home internet service is not always reliable. As a result, they opted to boost their WiFi signal (with no password), 24 hours a day, outside the building and into the parking lot. They have found that residents make use of the free WiFi frequently, evidenced by the large number of people regularly outside the building at picnic tables or in their cars using the internet. The library does not censor what residents are able to use the internet for, but anecdotally they see residents on zoom calls, working, studying, and using the internet for recreation and socializing. The library has an impressive variety of other wrap around supports that are enhancing digital equity in the community. They have:

- Chromebooks available for lending through the library

²⁵ More information: <https://nrbn.ca/>

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- a full-time tech assistant who can support residents with their tech-needs (however, this is not currently an ongoing, funded position)
- digital literacy programming, including seniors-training-seniors and iPad classes
- Beginning in July 2021, they will also have WiFi hotspots available which patrons can take home for a week at a time.

In addition to the range of options above, the following elements (on the bottom tier in the graph) are important components of a successful digital equity strategy. They ensure investments have the greatest possible reach, and benefit for all residents, regardless of economic and other barriers.

BEST PRACTICE

Free WiFi initiatives should be implemented in places where community members are already going to access services. This includes places such as libraries, the food bank, community halls, or even with local businesses, such as the local general store or cafe.

6



Access to connected devices. Supporting residents with their ability to access devices, such as computers, tablets, and smartphones, ensures that residents are able to benefit from connectivity initiatives.

For example, in rural eastern Ontario, many school boards provided students in need with devices at the start of the pandemic, which were used throughout the school year. Many of those devices have now been returned to the school boards.

Various rural libraries in Eastern Ontario are also beginning to offer devices that can be checked out, comparable to borrowing books. The most common concern expressed with regards to shared devices is concerns around security (such as banking passwords that were entered and not wiped). The Mississippi Mills Public library, described above, addresses possible security concerns with a program that automatically clears the session and removes all stored data each time the shared Chromebooks are shut down.

ConnectWell Community Health in Renfrew provided devices and WiFi cards to vulnerable residents during the COVID-19 crisis. They also have a Digital Health Committee, which is in its early stages of development.

A success example from the US, is the **Small Town Project's Bridging the Gap** program in Rocky Ford Colorado (Population: 4,000). In partnership with **PCs for People**, the initiative provides community members with access to refurbished desktop computers (starting at \$75), laptops (starting at \$100), as well as internet access for only \$15 per month. In addition, the organization is able to provide free and affordable tech support to assist residents with using devices. Through COVID-19, they also provided **"Remote Digital Toolkits"** to clients. This toolkit includes a business-powered laptop, wireless mouse/keyboard, headset/mic, and an invitation to a series of e-learning video meetings with their team to learn how to use the equipment as well as support with online schooling, applying for assistance, accessing resources, preparing for working remotely, resume writing, job search, and phone/video Interviewing.

Another option that has been put into practice in some rural communities is a portal for municipal departments, schools, libraries and social service agencies to make their surplus and decommissioned

equipment available to lower income residents. For example, **Peel4U**, run by reBOOT Canada, consists of a supply and demand portal, in which Peel residents can make a request for a device, and will be matched with available equipment.

7



Digital literacy. Residents need the skills to use devices and the internet, in order to benefit from connectivity projects. Digital literacy programs frequently target seniors, but other groups benefit as well, including youth and the business sector, who are required to adapt to new digital models.

A few examples of rural digital literacy projects include:

The Adult Highschool in Avonmore Ontario, **TR Leger**, is offering virtual digital technology training for residents geared towards digital skills required for today's workplace. Available courses include: using email, finding and researching information online, and creating documents and spreadsheets, and more.

The public library in Champlain Ontario offers free **virtual computer education sessions** for seniors. The sessions are weekly, one-on-one online sessions with seniors who have basic computer questions about their smartphones, tablets or computers, or questions about how to access the library's digital resources. Several other libraries in rural Eastern Ontario have, or are considering, similar programs. These programs have proven to be immensely popular.

Several options exist to assist businesses with transitioning to a virtual model. For example, the Smiths Falls Downtown Business Association (DBA) participated in the **Digital Main Street Ontario program**, and received access to the Digital Service Squad (DSS) to help downtown small businesses use digital technologies to adapt to a rapidly changing new digital work environment.

In an urban context, **CompuCorps** in Ottawa is an example of an innovative organization meeting the digital literacy needs of residents. In addition to selling refurbished technology, CompuCorps provides at risk groups (Aboriginal, youth, seniors and those living with disability) career and life skills training focused on access to technology and the internet. CompuCorps' model would be equally effective in a rural context.

reBOOT Canada delivers the innovative **Community reLAY** program, funded through a CIRA grant. Since August 2020, reBOOT Canada has partnered with 6 remote Indigenous communities across Canada to provide remote youth mentorship with skills development through the deployment and maintenance of

BEST PRACTICE

Digital literacy programs for seniors can be presented in a variety of ways.

- i. One-on-one sessions, including virtually, are best for trouble shooting specific tech problems.
- ii. Group sessions are best for general learning, and have the added benefit of reducing isolation. Both senior-to-senior, youth-to-senior, and trainer-to-senior models have been effective.
- iii. A third option is to present the programming as primarily a social opportunity, but build the use of devices and technology into the delivery of the program. (e.g. sharing travel photos using iPads). This can greatly increase the accessibility of the program, as the content is less intimidating.

Advertising for such programs can be done at churches, grocery stores, and other places where community members already go, since many participants are not yet connected to digital channels.

free WiFi hotspots. The youth are trained to set up and operate free WiFi hotspots -- enhancing digital literacy skills for youth, while also improving local connectivity. A win-win.

8



A robust and digitally enabled social services / not-for-profit sector. Several programs exist to support the not-for-profit and social service sectors with their digital capacity needs. However, there is room to do more in this area, as many agencies are navigating the digital landscape in isolation, resources are often not well known, and additional resources are lacking.

A popular option for the sector is **TechSoup**. Operating around the world, including in Canada, TechSoup is the “nonprofit tech marketplace”. They offer donated or discounted software, hardware, and IT services for not-for-profit organizations. In the United States, they also provide on-call Help Desk support to agencies, however this service is not available in Canada. E-learning and online courses are available to Canadian agencies, and would service rural agencies well.

An off-shoot of TechSoup, which is now its own initiative, is the **Community Tech Network (CNT)**. CNT’s primary object is to provide digital literacy training, however, they also operate a social enterprise in which not-for-profit organizations can hire CNT for services such as: digital program planning, community needs assessment, staff training needs assessment, virtual curriculum development, computer lab design, tech training for staff and more. The services are currently only available in the United States, but a similar model in Canada could be impactful for rural and urban agencies.

A Path Forward for Digital Equity in Rural Areas

The following strategy is proposed for advancing digital equity initiatives in the priority areas.

Convene the community

1. Assemble local stakeholders to identify community needs, gaps and opportunities to collaborate.

Maximize what already exists

2. Conduct digital asset mapping for each community (eg. where there is fiber, free WiFi, publicly owned buildings, existing digital equity programs).

3. Identify “low hanging fruit” opportunities to expand what already exists (eg. boosting free WiFi to a wider area, or adding a mobile component to an existing program) .

4. Ensure what already exists is communicated effectively to the community.

Pilot innovation

5. Seek funding for promising pilot program opportunities, including initiatives that have been tested in other jurisdictions and adapted to the local conditions.

6. Review pilot programs annually to assess impact, adjust where needed, and scale up the most effective concepts.

Implement population-specific strategies

7. Embed digital equity into existing population-based services and strategies, such as programs for seniors, low income residents, families with children, and other communities of unique need.

8. Identify gaps and new opportunities for key demographic groups who are currently digitally-excluded, tailored to their specific needs.

Advocate strategically

9. Collaborate with neighboring communities and other key players to advocate for program and policy change that improves digital equity in the community.



Options and Recommendations

Below is an extensive list of recommendations and options that could be implemented to support one or more component of digital equity. Local communities could consider their particular assets and challenges and select strategies that would be appropriate for their unique circumstances.



= Pilot Program Opportunity

General

1. Increase data collection and build socio-demographic analysis into assessments of digital equity projects and funds, for example:
 - a. Determine geographic areas with no internet collection and population groups with low connectivity rates.
 - b. Track true internet speeds in rural communities where CIRA Performance Test numbers are low. This should be further assessed in regards to areas with a high proportion of seniors, low-income populations, families with children and so on.
 - c. Gather data related to digital literacy skills, access to devices and the digital capacity of the not-for-profit sector.
2. Municipalities and Anchor Institutions (schools, health care, libraries, publicly owned utilities, etc.) conduct Digital Asset Audits to better understand how their assets can be leveraged in filling digital equity gaps and opportunities.
 - a. Assets audited could include physical assets like fiber connections and poles as well as intangible assets like software licenses and digital literacy content.
 - b. Hydro Ottawa and Hydro One create an inventory of their assets and make that information available publicly or to service providers for planning.
 - c. Housing authorities, school boards, hospitals, libraries, etc, assess their assets that can be leveraged for digital equity initiatives.
3. Municipalities and Anchor Institutions form digital equity committees responsible for coordinating efforts across departments to simplify and facilitate digital equity projects.
4. Existing publicly accessible digital equity resources (such as public WiFi locations and digital literacy resources) be provided to community members and organizations in an easy-to-use format, such as a digital equity map of the community.



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5. Stakeholders advocate for a comprehensive effort to address existing equity issues in the digital divide at the federal, provincial, municipal and community levels.^{26 27 28} For example: Advocating for Canada to develop a National Digital Equity Strategy.

Connectivity



6. Libraries and/or other service providers consider providing portable hotspot lending programs for households with no or unreliable internet connections.



7. Communities assess opportunities for increasing Public WiFi Hotspots. For example:
 - a. Indoor and Outdoor WiFi hotspots at public-owned buildings.
 - b. Public-Private partnership for free WiFi at cornerstone businesses in rural communities such as the general store, cafe or family restaurant. This would support local business while increasing connectivity options for residents.
 - c. Mobile hotspots could be considered where appropriate, such as on school buses, or a vehicle that travels between communities



8. Libraries and/or other service providers consider private Telehealth Booths, providing an opportunity for community members without a high-speed internet connection to participate in virtual health care appointments



9. Municipalities consider seeking opportunities to build (or partner in building) community broadband networks, particularly in areas where market supply of high-speed internet is not viable²⁹.

10. Rural municipalities consider a subsidy program to offset the initial install cost for lower income rural customers (for example, Lanark's Help Families Get Connected program³⁰).

11. The federal government extend the Connecting Families Initiative to rural residents, so that rural families in need have access to high-speed Internet service packages for \$10 per month from participating Internet Service Providers.

²⁶ [Internet for All Campaign - ACORN Canada, Public Interests Advocacy Centre and National Pensioners Federation](#)

²⁷ [Affordability And Accessibility Of Telecommunications Services In Canada: Encouraging Competition To \(Finally\) Bridge The Digital Divide](#) - Report of the Standing Committee on Industry, Science and Technology, House of Commons Canada

²⁸ [Canada's communications future: Time to act - Broadcasting and Telecommunications Legislative Review](#) - Innovation, Science and Economic Development Canada

²⁹ [Community Solutions Portal | Resources | Models for Community Broadband](#) - Future Cities Canada

³⁰ [Connect Lanark](#) - Lanark County

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12. Municipalities simplify their approval and consent processes for infrastructure projects. This could include the use of Municipal Access Agreements (MAA) for individual carriers to access municipal rights-of-way and install wireline connections.
13. Municipalities consider a Municipal Levy on property tax bills to assist with cost, (e.g. as done in Caledon³¹), similar to other basic services and infrastructure. This would provide a fund to offset the cost of infrastructure and/ or other digital equity programs.
14. Governments and advocacy groups support the proposed “Broadband and Infrastructure Expansion Act, 2021”³² which would ensure that municipalities and utility companies provide timely access to their infrastructure, including municipal rights of way and hydro utility poles, when appropriate.
15. Governments, crown corporations and community housing providers plan for connectivity in construction projects, rather than adding connectivity later, which is significantly more costly. For example: Dig Once policies³³ and new housing projects should be pre-wired for gigabit level connectivity during the initial build.
16. The requirements for Federal broadband funding and loan programs be adjusted such that they are less prohibitive to smaller providers, including community groups and smaller ISPs, as such groups are often invested in the most underserved community.

Devices



17. Community groups and agencies implement new device lending or device gifting programs, geared towards low-income residents, ideally offered in locations where residents seek other services (food banks, libraries, etc). Libraries are optimal for device lending programs. Donations could be sought from the private sector.



18. Community groups consider a social enterprise in the rural areas for refurbishing out of cycle computers, which can be sold to the public at an affordable cost³⁴. Such programs could also include tech training opportunities for the community.

³¹ [Internet Levy](#) - Town of Caledon

³² [Supporting Broadband and Infrastructure Expansion Act, 2021, SO 2021, c. 2 - Bill 257](#) - Legislative Assembly of Ontario

³³ ['Dig Once' Policies](#) - Broadband Infrastructure Office, North Carolina Department of Information Technology

³⁴ See [CompuCorps](#) in Ottawa as an example



19. Agencies collaborate on the creation of a centralized supply and demand portal for the repurposing of surplus devices. For example, when institutions and the private sector upgrade equipment, the surplus equipment can be available free of charge to low-income households.

Digital Literacy



20. Offer additional digital literacy programs specifically for seniors. This could be:
 - a. Intergenerational: youth trained to provide tech support to others in the community, including seniors. This could be integrated with high school volunteer hours, and would provide valuable job-skills for youth.
 - b. Senior to senior tech support and training programs: Seniors providing training and support to other seniors. This would also have the added benefit of reducing isolation amongst seniors.
 - c. Agencies build simple-to-use tech into existing programs for seniors, such as in the delivery of exercise and social activities³⁵. This increases the tech skills of seniors without being as daunting as a tech-training program.



21. Increase digital literacy programs for marginalized youth and under-employed adults. This could be combined with innovative solutions for connectivity, such as training (and potentially employing) residents to build and maintain hotspots, offer HelpDesk support, and provide other tech-services.



22. Place greater emphasis on digital literacy skills, including workplace skills, explicitly taught in the standard school curriculum.



23. There is a need for a greater availability of affordable digital literacy courses (such as using computers, software packages and more) to the general public, as well as better promotion of what already exists. This could be provided through post-secondary institutions, and could be delivered through virtual learning in order to address transportation challenges.



24. All libraries have a permanently funded technology support position, which can coach community members with their basic digital literacy needs³⁶.

25. E-business training broadly available for small businesses who wish to pivot to more digital models, such as e-stores and virtual services³⁷.

³⁵ One example offered by a library was a program for seniors to share travel photos using iPads

³⁶ A successful but not-permanently funded model exists at the Mississippi Mills Public Library

³⁷ As an example, [Digital Main Street](#)

Capacity of the not-for-profit sector

26. The sector consider greater coordination across agencies around the digital equity needs of residents, including scalable and collaborative solutions. This could include collaboration on a supply and demand portal for devices, bulk buying of tech equipment, sharing of content (such as digital literacy training curriculums), cross promotion of available resources (such as TechSoup and open source options), shared learning opportunities, best practices and more.
27. The sector build tech and tech skills into a larger number of their existing programs (such as recreational programs for youth, social programs for seniors, skills development programs for underemployed residents, and so on), in order to develop the capacity of residents.
28. Funders allow and encourage organizations to include connectivity and devices as standard budget lines in funding applications, similar to food or space rentals, so that organizations can develop their digital capacity and meet the virtual and digital needs of their clients.
29. A social enterprise opportunity exists for a central HelpDesk, to support the sector with their digital needs, including tech training for staff, tech support and assisting organizations with adapting to digital solutions and pivoting to virtual models³⁸.
30. Better promotion of affordable software options for the not-for-profit sector, for example:
 - a. Better promotion of TechSoup Canada³⁹ and similar initiatives providing discounted software licenses
 - b. A greater understanding and adoption of open-source software.
31. The sector seek ways to leverage their assets for community benefit. This could include WiFi publicly available in their buildings (particularly in rural areas where WiFi is limited), donating decommissioned hardware, sharing access to software where feasible, creating telehealth or e-learning rooms when space is available, and so on.



³⁸ [Adult Learner Hotline – Baltimore Digital Equity Coalition](#)

³⁹ [Catalogue](#) - TechSoup Canada

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