

Digital Technology Adoption in Northern and Remote Indigenous Communities in Canada

Appendix 2: Identification of Primary and Secondary Data Sources

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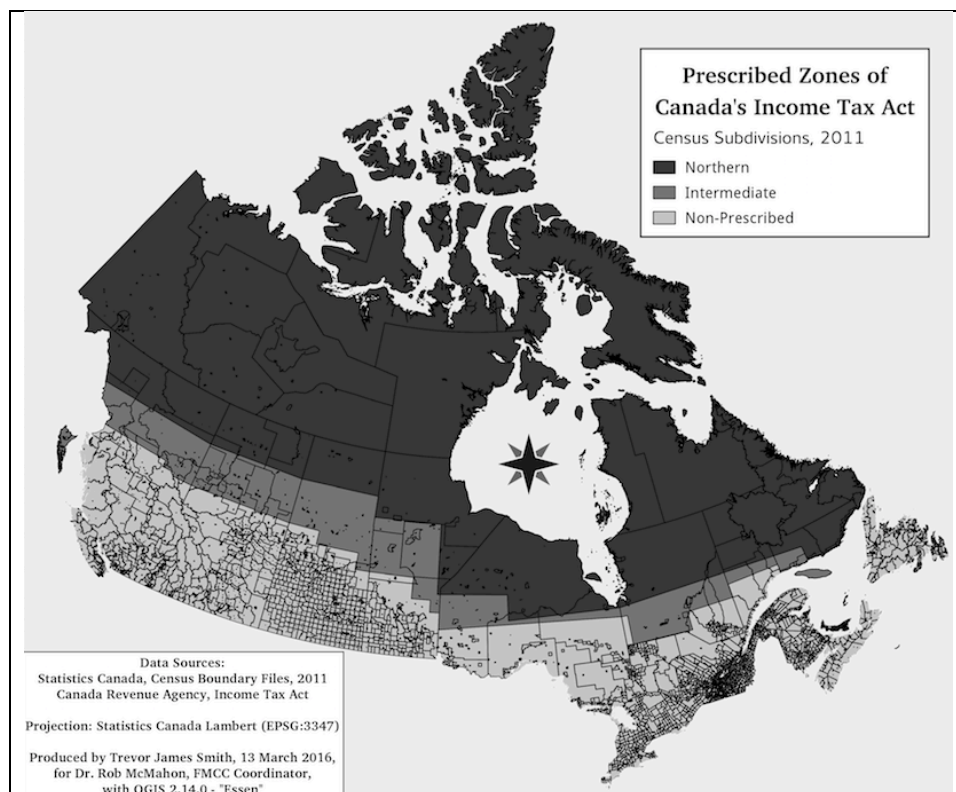
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Identification of primary and secondary data sources

This section provides an overview of primary and secondary data sources on digital technology adoption in Northern Indigenous communities. It complements our literature review and consists of two parts. First, it presents the geographic focus of our report, including some mapping resources FMCC is using for our CRTC BSO submissions (FMCC, 2015). Second, it presents a summary of data sources related to digital technology adoption in northern Indigenous communities. Our review of these data sources confirms the lack of information available about actual community member and household adoption and use of digital technologies in Indigenous communities.

1 Defining the geographic focus of this report

The FMCC team defines the geographical boundaries of the Northern and remote Indigenous regions that we focus on in this report as including both territories and the northern regions of provinces. Following the approach used in the *Centre for the North* report on Northern connectivity (Fiser, 2013), we created a map of Northern Indigenous communities (including territories and provinces) using Geographic Information System (GIS) software. The map can be adapted to include layers of statistical data for illustrative purposes (depending on how the data is formatted). It identifies the regions we consider in our report in Northern and Intermediate shaded areas:



Other existing mapping resources illustrating northern Indigenous regions are available. These include:

Description	URL
Inuit Nunangat Map	http://www.aadnc-aandc.gc.ca/Map/irs/mp/mp-eng.asp
Aboriginal Affairs and Northern Development Canada (AANDC): First Nation Profiles Interactive Map	http://fnpim-cippn.aandc-aadnc.gc.ca/index-eng.html
All Nations Trust Company: B.C. First Nations connectivity	http://www.pathwaystotechnology.ca/interactive-map
Ontario First Nations	http://communities.knet.ca/

2 Overview of primary and secondary data sources

In this section we identify primary and secondary data sources that we found on digital technology adoption in Northern Indigenous communities. These data sources are organized according to three sets of variables drawn from the Analytical Framework and Approach outlined in Section 1.5 of the report. In this section we provide an overview of data sets associated with these variables. The summary illustrates available data sources, and provides short descriptions and URL links to some online resources.

2.1 Data sources associated with community members / household factors

1) *Socio-economic factors* (cost, education, income, age, ethnicity / “race”, etc) are generally available through government statistical bureaus. The following table illustrates the different northern communities / regions and the statistical bureau that provides information about them.

Geographic Scope/Area of Interest	Statistical Bureau
Canada, Provinces/Territories, Census Divisions/Municipalities, Health Regions	Statistics Canada (CANSIM, Census, National Household Survey)
Census Divisions/Municipalities, Aboriginal Communities	Aboriginal Affairs and Northern Development Canada (Community Well-Being Index) ¹
NFLD, Municipalities, Nunatsiavut Communities	Government of Newfoundland and Labrador
Nunavut, Municipalities, Inuit Communities	Government of Nunavut
NWT, Municipalities, Inuvialuit Communities	Government of the Northwest Territories
Kativik Regional Government – Nunavik Communities in partnership with Université de Laval (Quebec)	Nunivaat
Yukon First Nations	Government of Yukon

¹ A numeric indicator for socioeconomic health based on census values for education, labour, income, housing figures for Indigenous communities.

From StatsCan, the Canadian Socio-Economic Information Management System (CANSIM) includes several socioeconomic indicators that are useful for our report. The following table summarizes these data sets, the years where data is available, and the CANSIM table code where the data can be found:

Data Set	Time Series Length (years)	CANSIM Table Code
Labour Force Survey Estimates (Monthly)	Jan 2005 – July 2015	282-0100
Labour Force Survey Estimates (Annual)	2001 – 2014	282-0123
National Household Survey / Federal Census (Specific Years)	2001, 2006, 2011	109-0300, 109-0400, 109-0401, others
Survey of Household Spending on Household Operation, Internet Service (\$/year) (Terminated)	1999 – 2009	203-0004
Consumer Price Index (Monthly)	Jan 1995 – July 2015	326-0020

NBDC did a broadband socioeconomic impact assessment in 2012. An online survey tool was used and we got decent participation, including info about what people did and did not do online and why. It is on NBDC's website at <http://nunavut-broadband.ca/projects/broadband-socioeconomic-impact-assessment>.

As well, Stats Canada has some great data on internet activities that you can examine with different demographic filters (education level, household income level, etc.). While this data is for the rest of Canada, I think it accurately reflects the reality in Nunavut (i.e. similar behaviour as in South, as influenced predominantly by education and income). See the table at <http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=3580153>

The best data on household internet access came from the 2009/2010 household needs survey - interviewers went door to door, to every household in Nunavut. It shows great disparities between communities. <http://www.stats.gov.nu.ca/Publications/Housing/Data%20Tables/Table%2018%20-%20Households%20by%20Internet%20access,%20Nunavut,%20regions%20and%20communities,%202009-2010.xls>

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Governments in the northern territories and regional governments in the northern regions of provinces also collect socioeconomic data that is useful for our report. The following table provides a summary of kinds of data sets available from these sources (organized by northern region).

Data Set (Annual by Community)	Labrador/ Nunatsiavut ²	Northwest Territories / Inuvialuit	Nunavik	Nunavut	Yukon
Population (count)	Yes*	Yes	Yes	Yes	Yes*
Mean Individual Income (\$)	Yes*	Yes	Yes	Yes	Yes*
Average Household Income (\$)	Yes*	Yes	Yes	Yes	Yes*
Average Household Rent (\$)	Yes*	Yes	Yes	Yes	Yes*
Unemployment (%)	Yes*	Yes	Yes	Yes	Yes*
Households spending >30% of Income on Shelter (%)	Yes*	Yes*	Yes*	Yes*	Yes*
Social Assistance Beneficiaries (count)	No	Yes	No	Yes	Yes*
Social Assistance Expenditures (\$)	No	Yes	No	Yes	Yes*
Educational Achievement (%)	Yes*	Yes*	Yes*	Yes*	Yes*

We also collected several online reports and resources that provide socioeconomic data specific to Indigenous communities. The following table summarizes resources on general socioeconomic data, provides links to where they can be found online.

Agency	Description	URL
Inuit Qaujisarvingat	Naasautit: Inuit Health Statistics	http://www.inuitknowledge.ca/naasautit
ArcticNet Data and the Polar Data Catalogue (PDC)	The Polar Data Catalogue is a database of metadata and data that describes, indexes, and provides access to diverse data sets generated by Arctic researchers.	http://www.arcticnet.ulaval.ca/research/data.php https://www.polardata.ca/
First Nations Information Governance Centre	Online Data Portal includes First Nation information on: community wellness, demographics, education and language, employment and income, health, and other areas (2008 to 2010)	http://data.fnigc.ca/online
Statistics Canada	Projections of the Aboriginal Population and Households in Canada (2011 to 2036)	http://www.statcan.gc.ca/daily-quotidien/150917/dq150917b-eng.htm
Statistics Canada	Aboriginal Peoples: Fact Sheet for Canada (2011/2012)	http://www.statcan.gc.ca/pub/89-656-x/89-656-x2015001-eng.htm
AANDC	Aboriginal Demography – Population, Household and Family Projections (2001 to	https://www.aadnc-aandc.gc.ca/eng/1309463897584/1309464064861

² For ease of analysis, socioeconomic data for Nunatsiavut and Labrador was directly sourced from StatsCan. However, an innovative tool for Newfoundland and Labrador community data exists in the Community Accounts statistics explorer (Newfoundland and Labrador Statistics Agency, 2015).

	2026) (produced in 2007) ³	
BC Stats	Aboriginal Community Data Initiative	http://www.bcstats.gov.bc.ca/StatisticsBySubject/AboriginalPeoples/AboriginalReports.aspx
NWT Government	Socioeconomic data is compiled and maintained by the NWT Statistical Bureau	http://www.statsnwt.ca/ Community Profiles: http://www.statsnwt.ca/community-data/Summary%20of%20NWT%20Community%20Profiles%202015.pdf
Arctic Council	Arctic Social Indicators II (2011-2013) Building and testing social indicators to help facilitate monitoring of changes in human development relevant to Arctic residents. It tested, validated and refined indicators across the Arctic, and then measured and performed analyses of select cases. The goal is for Arctic governments and the Arctic Council to adopt these indicators for the purpose of long-term monitoring of human development.	Description of this report is available here: http://www.sdwg.org/project/2011-2013-sdwg-deliverables/# Full report is available for download here: https://oaarchive.arctic-council.org/handle/11374/48
Yukon Government	Socioeconomic data is compiled and maintained by the Yukon Bureau of Statistics	http://www.eco.gov.yk.ca/stats/index.html Yukon First Nation profiles http://www.eco.gov.yk.ca/788.html

We found several online resources that provide information on economic development and Indigenous populations, including statistics on employment and education. Summaries of these information sources are presented below, along with links to where they can be found online.

³ From a list of resources available at: <https://www.aadnc-aandc.gc.ca/eng/1319568131129/1319642793284>

Agency	Description	URL
Arctic Council	Sustainability Development Council Working Group 2015 report on the <i>Economy of the North</i> (to be published in March 2016) The <i>Economy of the North 2015</i> (ECONOR III) will provide an updated overview of the economy, socio-economic living conditions and environmental issues in the circumpolar Arctic, as impacted by the global economy and climate change.	Description of this report is available here: http://www.sdwg.org/project/current-projects/#
Nunivaat	Nunavik Statistics Program support by Kativik Regional Government in partnership with Université de Laval	http://www.nunivaat.org
AANDC	Northern Economic Development Indicators (2007)	https://www.aadnc-aandc.gc.ca/eng/1319648435452/1319648554865
CanNor	Northern Economic Index (2011-12)	http://www.cannor.gc.ca/eng/1387900596709/1387900617810
CanNor	Northern Economic Diversification Index (2012-2013)	http://www.cannor.gc.ca/eng/1388762115125/1388762170542
Stats Can	Education and employment experiences of Inuit (2012)	http://www.statcan.gc.ca/pub/89-653-x/2013001/article/part-partie-b-eng.htm
Stats Can	Aboriginal Labour Force Survey: Educational Attainment, 2007 to 2014	http://www5.statcan.gc.ca/cansim/a26?lang=eng&etrLang=eng&id=2820228&pattern=aboriginal&tabMode=dataTable&srchLan=-1&p1=1&p2=49
Stats Can	Aboriginal Labour Force Survey: Employment Estimates by North American Industry Classification System, 2007 to 2014	http://www5.statcan.gc.ca/cansim/a26?lang=eng&etrLang=eng&id=2820229&pattern=aboriginal&tabMode=dataTable&srchLan=-1&p1=1&p2=49
(BC) First Nations Economic Development Database	The First Nations Economic Development Database is a collection of First Nations economic development initiatives in BC, accessible through a user-friendly and searchable interface.	https://www.fnedd.ca/about.html

In addition, the Université de Laval sponsored by the Kativik Regional Government with a \$500,000 investment, began a follow up study in 2015 on household spending in Nunavik. The study is intended to include spending on connectivity and internet usage. For more information about this study visit

http://www.nunatsiaqonline.ca/stories/article/65674researchers_to_track_consumer_habits_in_nunavik_find_which_households_/

2) Attitudes / perceptions / beliefs about digital technologies and the Internet

Data sources in this area are more difficult to find. Reports produced by the U.S.-based Pew Centre for Internet Research provide a good baseline on the general population that may be used to consider this issue with respect to Indigenous populations. These resources are available at: <http://www.pewInternet.org/>.

3) Digital technology adoption: number of devices owned; household spending on digital technologies; use of digital technologies

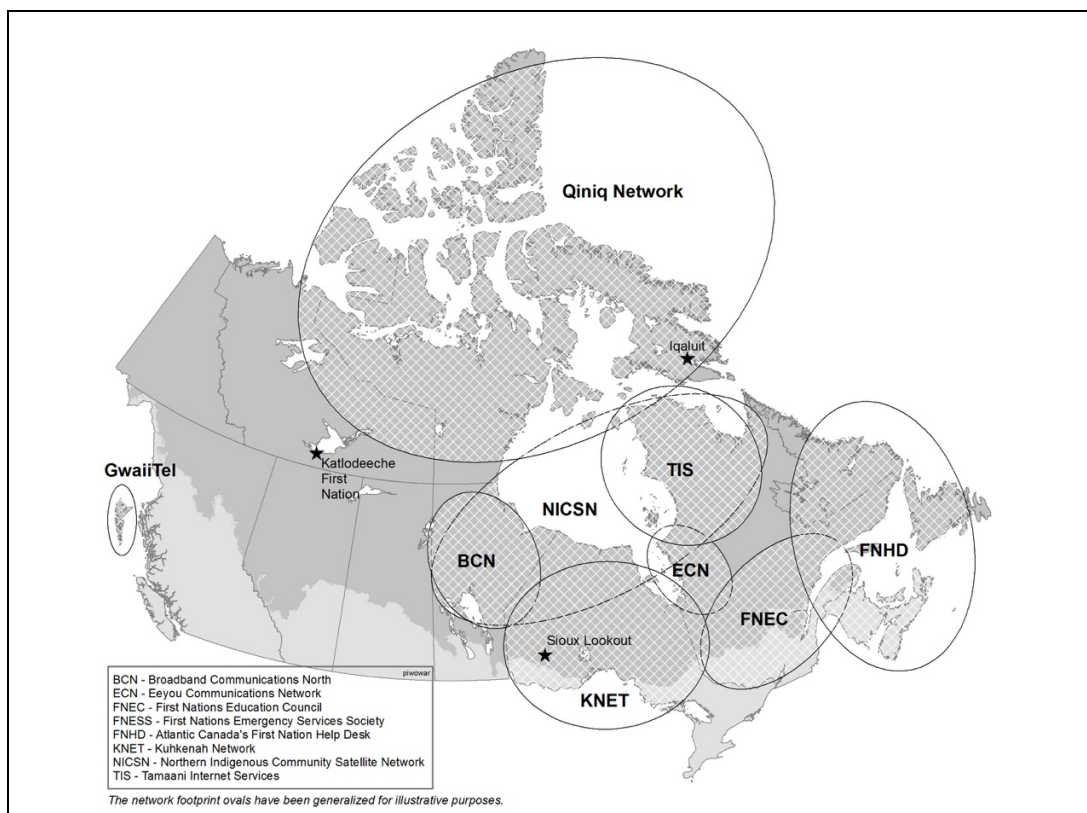
We found several sources for this data, which are collected by both government agencies and by third-party researchers. Summaries of these information sources are presented below, along with links to where they can be found online.

Agency	Description	URL
Canadian Radio-Television and Telecommunications Commission (CRTC)	Annual Communications Monitoring report (2015) but this report excludes the three territories and many of the First Nations in the provinces.	http://www.crtc.gc.ca/eng/publications/reports/policymonitoring/2015/cmr2.htm
Government of Nunavut	Internet access: household needs survey (2009/2010)	http://www.stats.gov.nu.ca/Publications/Housing/Data%20Tables/Table%2018%20-%20Households%20by%20Internet%20access,%20Nunavut,%20regions%20and%20communities,%202009-2010.xls
Stats Can	Canadian Internet use survey (CIUS), Internet use, by age group, Internet activity, sex, level of education and household income (2010 and 2012) but exclude the three territories and many of the First Nations in the provinces.	http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=3580153
Imaituk Inc. (Prepared for the Northern Communications & Information Systems Working Group)	Arctic Communications and Infrastructure Assessment (ACIA) report (2011)	http://northernconnectivity.ca/
Nunavut ICT Summit	Archive of Presentations on digital technologies in Northern Canada (2012)	http://www.nunavutictsummit.ca/presentations
Centre for the North	Wiring the Future of the North: Report on Northern Connectivity (2013)	http://www.conferenceboard.ca/networks/cfn/blog/13-07-29/wiring_the_future_of_the_north_report_on_northern_connectivity.aspx
Nordicity (Prepared for the Northern Communications & Information Systems Working Group)	Northern Connectivity: Ensuring Quality Connections (2014)	http://northernconnectivity.ca/
Canada's Public Policy Forum	Northern Connections Broadband and Canada's Digital Divide (2014)	http://www.ppforum.ca/sites/default/files/BroadBand_Final_PPF_en.pdf
Nunavut Broadband Development Corporation	Video report of a Dec 2015 study released by IPSOS about digital participation (25 mins)	https://www.youtube.com/watch?v=uHdmSY7NRn0
Nunavut Broadband Development Corporation	Broadband socioeconomic impact assessment (2012) - Includes information on what people did and did not do online and why.	http://nunavut-broadband.ca/projects/broadband-socioeconomic-impact-assessment

Social Sciences and Humanities Research Council	Broadband Adoption in Low income communities (2010)	http://www.ssrc.org/publications/view/1eb76f62-c720-df11-9d32-001cc477ec70/
Nunavut Broadband Development Corporation	Intervention in the CRTC's Basic Service Objective hearing: lists information in Inuit use of social media (2015)	Available for download on CRTC website (CRTC 2015-134)
Government of NWT	Intervention in the CRTC's Basic Service Objective hearing (July 2015)	Available for download on CRTC website (CRTC 2015-134)
Karl Kowalski, University of Alaska	Survey UArctic Members on Telecommunications and Broadband Needs in the Arctic November 2015)	https://docs.google.com/forms/d/122xnFytWmEN4uGXH09OyrlyUK7HqiVRiUVHELjphGNc/viewform?c=0&w=1

2.2 Data sources associated with community-level factors

1) *Local leadership and coordinated planning and design* can be illustrated by the number of northern Indigenous regional and community-based broadband organizations. We have created a map showing Indigenous technology (broadband) organizations and their areas of interest. We can contact the map creator to update this map to illustrate Indigenous organizations working in the areas covered in this report. Here is the map:



The table below lists the regional Indigenous technology organizations operating in the regions discussed in this report, including their URLs and operating regions. Further research needs to be conducted on the number of local owned networks.

Region	Organization	URL
B.C.	First Nations Technology Council	http://www.technologycouncil.ca/
B.C.	All Nations Trust Company	http://www.pathwaystotechnology.ca/
Alberta	(First Nations) Technical Services Advisory Group	http://www.tsag.net/
Saskatchewan	Keewatin Career Development Corporation	http://www.kcdc.ca/
Manitoba	Assembly of Manitoba Chiefs	http://www.manitobachiefs.com/
Manitoba	Manitoba Keewatinowi Okimakanak Inc. (MKO) Submitted materials to CRTC BSO hearings, including survey on ICT use and needs in Manitoba)	http://www.mkonorth.com/
Manitoba	Broadband Communications North	http://www.gobcn.ca/
Ontario	K-Net Services	http://knet.ca/
Ontario	Northern Indigenous Community Satellite Network (NICSN)	http://smart.knet.ca/satellite/
Ontario	Western James Bay Telecom Network	http://wjbtn.com/
Quebec	First Nations Education Council	http://www.cepn-fnec.com/
Quebec (Nunavik)	Kativik Regional Government – Tamaani Internet Services	http://tamaani.ca/
Quebec (Eeyou Istchee)	Eeyou Communication Network	http://www.eeyou.ca/en/home
Atlantic Canada	Atlantic Canada First Nations Help Desk	http://firstnationhelp.com/
Yukon	Council of Yukon First Nations	http://cyfn.ca/
Nunavut	Nunavut Broadband Development Corporation	www.nunavut-broadband.ca

Funding supports: We have been conducting research to determine past and existing broadband funding initiatives provided by government departments and funding agencies. We are currently verifying the status of these programs through interviews with government staff. We have created several tables – including a GANTT chart that shows change over time – that illustrate the various funding programs. We can highlight programs focused on northern and region regions. Through this work we can assess the availability of funding programs to community-based organizations, including funding criteria. Our initial review clearly illustrates the complex and fragmented nature of funding for broadband infrastructure and services in rural, remote and Northern communities. When available, such funding initiatives are often challenging for community-based organizations to access and utilize for a number of reasons.

2) Training (skills, jobs): We found several general sources for this data, which provide a general snapshot of the ICT sector in Canada. If required, we will have to conduct additional research on specific data related to northern territories and Indigenous populations. A brief summary of these information sources is presented below, along with links to where they can be found online.

Source	URL
CRTC annual Communications Monitoring report (2015)	http://www.crtc.gc.ca/eng/publications/reports/policymonitoring/2015/cmr2.htm
Industry Canada – ICT Sector Profiles (multiple years)	http://www.ic.gc.ca/eic/site/ict-tic.nsf/eng/home
Information and Communications Technology Council	http://www.ictc-ctic.ca/
Information Technology Association of Canada	http://itac.ca/
Canada Business Network – ICT Sector Profiles and Statistics	http://www.canadabusiness.ca/eng/page/2710/
Canada’s Association of IT Professionals	http://www.cips.ca/
Canadian Advanced Technology Alliance	http://www.cata.ca/research/
(If Needed) – Long list of ICT Associations in Canada	http://www.backbonemag.com/Technology/Canadian-Tech-Associations/

*3) Digital technology use by public / community services*_(Health, Education, Justice, Public Works, Emergency Management, etc.).

The table below lists some representative sources that can help illustrate how digital technologies are being used in northern Indigenous communities to delivery public and community services. It would be possible to conduct additional research on specific data related to northern territories and Indigenous populations. A brief summary of these information sources is presented below, along with links to where they can be found online.

Source	URL
O'Connor, K. (2013). "The use of ICTs and E-learning in Indigenous Education", published in Barbour, M.K. (2013). State of the Nation: Online K-12 Learning in Canada, Canadian eLearning Network, p. 89.	http://www.openschool.bc.ca/pdfs/state_of_nation-2013.pdf
Barbour, M.K. (2013). State of the Nation: Online K-12 Learning in Canada, Canadian eLearning Network.	http://www.openschool.bc.ca/pdfs/state_of_nation-2013.pdf
Keewaytinook Internet High School (2014). National e-Learning Strategy: Presentation Portion by Keewaytinook Internet High School – Ontario	http://kihs.knet.ca/
Eeyou Communication Network and the Cree School Board – Quebec	https://www.cscree.qc.ca/en
Health Canada – <i>Interim National Directive for the FNIHB e-Health Program – e-Health Solutions</i> (2008)	Information on benefits of telehealth in remote/northern communities
Information and Communication Technologies to Support Health and Wellness in Remote and Rural First Nations Communities: Literature Review (O'Donnell et al, 2010)	2010 lit review overview of telehealth in remote and rural First Nations
Keewaytinook Okimakanak e-Health – Ontario	http://telemedicine.knet.ca/
Health Canada: First Nations and Inuit Health Branch	
Eeyou Communication Network and Cree Regional Health Board – Quebec	http://www.creehealth.org/
Mackenzie, O. (2015). Annual Report by KOeHealth Telemedicine Services (KOeTS) . Compiled for: First Nation and Inuit Health, Ontario Region (June 2015). – Ontario	
Nunavut Court of Justice. "Sivumuaqpallianiq The Way Forward: A Statistical and Comparative Review of Court Operations in Nunavut 2014." Iqaluit, June 26, 2015, pp. 17, 22, 79. – Nunavut	
McGill University Health Center's Telehealth section posts detailed usage statistics pertaining to Northern Quebec and Nunavik	http://telesantemcgill.ca/tswp/?page_id=183
INAC New Paths for Education Project Annual Report requirements for First Nation schools including digital technologies available and purchased, Internet Connectivity (transport, technology, local connections)	https://www.aadnc-aandc.gc.ca/eng/1386907954992/1386908008274
First Mile Indigenous Community Stories about innovative digital services and networks.	https://www.google.com/maps/d/viewer?mid=zhZVmkxGC3-s.kNvvZlfOP9k0&ie=UTF&msa=0

2.3 Data sources associated with infrastructure supporting adoption

These data sources are associated with availability, price, quality of service, interoperability. Some of this information is available in the data sources listed above, such as those focused on Digital Technology Adoption. Here we summarize additional sources related to the infrastructure supporting adoption (some of these sources listed do include other communities and regions as well as Indigenous communities):

Organization	Data Provided
FMCC overview of Northern broadband providers	Data on pricing available (in Excel file)
Centre for the North report on Northern Connectivity (2013)	Internet service providers access cost and user demographics for Northern and Aboriginal communities at the provincial level
Statistics Canada “Survey of Household Spending on Household Operation, Internet Service” (Terminated in 2009)	Internet service costs by region
M-Lab - Measurement Lab (2015)	Internet performance test data for download and upload throughput
CIRA – Canadian Internet Registration Authority (2015)	Internet performance test data for download and upload throughput
CRTC’s SamKnows monitoring project (report forthcoming in early 2016)	http://www.crtc.gc.ca/eng/info_sht/i3.htm
CRTC annual Communications Monitoring report (2015)	http://www.crtc.gc.ca/eng/publications/reports/policymonitoring/2015/cmr2.htm
INAC website on Connectivity (2013) – has basic information but some of it is wrong. Has all First Nations (except for Inuit) and links to their current data and to 2011 StatsCan summaries	http://www.aadnc-aandc.gc.ca/eng/1352214337612/1353504776242
Northwestel Modernization Plan	http://www.nwtel.ca/about-us/who-we-are/investing-canadas-north/our-modernization-plan
SSI Micro	https://www.ssimicro.com/
Airware in NWT	https://www.airware.ca/
Qiniq in Nunavut	https://www.qiniq.com/
Xplornet	http://www.xplornet.com/