Briefing Note

Submarine Cables: Bringing Broadband Internet to the Arctic, a Life Changer for Northerners?

Michael Delaunay

The internet has already changed the lives of billions of people all over the planet and still continues to do so. But in order to fully benefit from what the internet can offer, a broadband connection is essential. In the Arctic this is not yet the case. A large portion of the Arctic region suffers from a bad connection. There exists a significant digital gap between the northern and the southern region of the Arctic countries.

For the majority of the inhabitants of the Arctic regions, internet is very expensive, but not only that; it offers a low bandwidth and a low data cap. This is particularly the case in Nunavut where Inuit rely on only one way to connect: via satellite. Other regions can be connected via micro wave or terrestrial fiber optic cables, but not all of them.

Even if the satellite and microwave connect the northerners to the rest of the World, these technologies are likely to suffer due to the harsh environment (ice, snow storms, electromagnetic storms) that can disrupt, and even cut off completely, the only way to communicate for some of the Indigenous communities.

Submarine cables for now seem to be the most reliable, fastest and cheapest option in the long term to connect most of the communities to broadband internet, even in the Arctic. While most of the Arctic communities are settled on shores in the North American Arctic, especially in Canada, the option of laying submarine fibre optic cables to connect them to broadband internet might be a solution.

But why is broadband internet via submarine fibre optic cables vital for the Arctic populations? How has the internet changed their lives and will it continue to do so?

Michael Delaunay is a PhD student at the Université de Versailles Saint-Quentin, France.

Internet, an Everyday Necessity

Internet is central to everyday life in the North, especially for Indigenous peoples, and is now considered as a basic need and even a human right. It helps the Inuit to protect their culture and rights by raising awareness via social media. Unfortunately, most of the time they must deal with bad connections and signal problems. However, change could be around the corner with the completion of several projects of submarine cables coming to the Arctic, bringing broadband to the top of the world.

The fact that Connectivity was chosen as one of the four priorities of the Finnish chairmanship of the Arctic Council (AC) from 2017 to 2019[1] appears to be logical when we combine all the studies published on this subject over the past few years. It reveals the enormous need for a better connection in the Arctic regions. It has been a Northern concern for many years, while reports point towards the need for faster, more reliable and affordable broadband connections for all Arctic inhabitants and especially Indigenous peoples.[2]

The will of the AC to take this matter into consideration is highlighted by the creation of the Task Force on Telecommunications Infrastructure in the Arctic (TFTIA),[3] and the release of two reports on Arctic telecommunications: the Arctic Economic Council's (AEC) January 2017 report *Arctic Broadband, Recommendations for an Interconnected Arctic*,[4] and the AC's May 2017 report on *Telecommunications Infrastructure in the Arctic: A Circumpolar Assessment.*[5]

A basic need and a human right

As with running water, electricity or food, broadband internet access has become a necessity for everyday life. In 2016, the Canadian Radio-television and Telecommunications Commission (CRTC) declared broadband internet as a basic need.[6]

Perhaps even more than a need, internet has been a legal right for every citizen since 2010 in Finland, an Arctic country where internet access is a universal service obligation (USO) at a minimum rate of 2Mbps since 2015, with a target of 10Mbps by 2021.

In 2016, the United Nations took this further by pushing the vote of a non-binding resolution defining internet access as a basic Human Right.

Amazon prime in the Arctic, a double-edged sword?

Thanks to internet, the everyday lives of some of the northerners have changed in the past few years through the use of Amazon. The Amazon Prime membership was, and still is, an essential tool in everyday life for some of the North American communities.

This status allows customers to ship their purchases from this website for free to almost anywhere in North America[7] within a few days, sometimes more for the Arctic regions, for only 79 CDN$ a year for Canadians and 99 US$ for the United States. Like everything in the North, shipping costs are much higher than in the south of the US and Canada. Shipping goods by plane is expensive, and by sealift it is only possible during summer, and even then only for non-perishable foods and supplies. That's why the free delivery Prime status has become such a boon for the northerners.

In Arctic Alaska, for instance, Prime allows Alaska inhabitants to purchase everyday items for the same price they would pay in the contiguous United States. For example, the owner of one the few hotels in Utqiagvik can serve fresh bread for breakfast every day because he can order his flour

on Amazon for a much lower price thanks to Prime. Furthermore, he can fill his vending machine with cheaper candies than the local store paying shipping fees, making local kids happy to be able to buy affordable sweets.

But the benefits don't just apply to food. They're seen in schools as well. In Eagle, Alaska, a remote town located near the Canadian border, the towns' school principal, Kristy Robbins, uses Amazon Prime to provide her school with gym and art supplies, allowing them to last until the end of the year even when the road is closed during winter.[8]

Before the Prime status was created, people of Alaska living in remote villages who wanted to save money for shopping had to fly to urban areas such as Anchorage or Fairbanks, buy their goods, and then mail them through the United States Postal Service (USPS) or ship them by plane back to their home in the Arctic.

A double-edged sword for Canadian communities

Canadian northerners used to also benefit from Prime's free shipping until April 2015 when Amazon decided to ship for free only to the capitals of the Arctic territories (i.e., Iqaluit, Nunavut; Yellowknife, Northwest Territories; and Whitehorse, Yukon).[9] Since then, northerners must pay $29 CDN plus $9.99 CDN per pound of weight, making it impossible to order vital goods at affordable prices.[10]

The end of Amazon's free shipping for Canadian Arctic communities had dramatic economic impacts, especially in Nunavut where severe food insecurity continues. Residents can now only rely on local stores where food prices are high, as shown by *Feeding my Family*'s Facebook page,[11]where Inuit try to raise awareness by posting pictures of the food prices in local stores[12] and the increased costs of Amazon's delivery prices.[13]

Free shipping was a real life-changer for Inuit communities, allowing them to buy both food and essentials for everyday life at much lower prices than they were used to in local stores. However, Amazon Prime should not be considered as the solution to food insecurity. On the one hand, it is only accessible for people who can afford a credit card and subscribe to the Prime membership status. On the other, it creates dependency which leaves no backup options in case free shipping is canceled.

The internet is not the only answer to every problem in the Arctic, but it can sometimes be a very useful tool to help diminish the drawbacks of living in the very remote North, and also raise awareness about Indigenous life and living conditions, such as through social media.

A tool to gain from political weight

Despite low speed, high prices and data caps[14] for internet connections, Inuit are social media savvy. Internet is used, primarily but not exclusively, to gain visibility in media and develop political weight.

This massive use of social media helps Indigenous peoples become more visible to society throughout campaigns in the cyber and the real world, making their voices heard. Whether it is in Greenland, Canada or in Alaska, Inuit use Facebook and Twitter when their culture or way of life is attacked.

#Sealfie

A significant example of the importance of social media is when the American television celebrity, Ellen Degeneres, twitted a *selfie* taken during the Oscars ceremony in 2014 to raise money against seal hunting. It was, until recently, the most shared tweet in the history of the platform. Following that *tweet*, Inuit people mobilized together on Twitter and, in opposition, created the hashtag #Sealfie, posting s*elfies* of Inuit wearing seal skin in a bid to defend their traditional way of life and to oppose the seal hunt ban campaign, not only in big communities of the Canadian Arctic but also in remote villages. Thanks to the internet this action had an international echo.

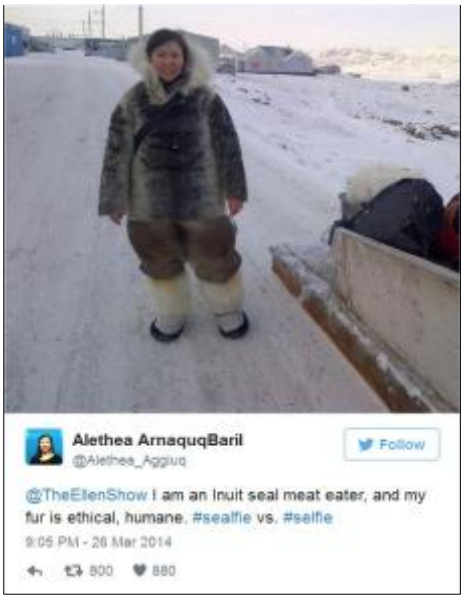

Figure 1. A tweet of an Inuk wearing seal skin

"Idle No More"

The Idle No More (INM) movement gained visibility not only because of physical protests around the real world, but also because of activism in the cyber world. It began in late 2012 after four women[15] in Saskatchewan, Canada, exchanged e-mails worrying about the effects of the Federal government's omnibus budget Bill C-45 that threatened the environmental protection of almost all Canadian waterways.

The movement first gathered together Firsts Nations, Metis and Inuit, and then spread all over North America and even around the world with rallies, protests, flash mobs and marches organized in urban centers. In parallel, it took over the cyber world via a very popular hashtag on Twitter, #IdleNoMore, and through a Facebook page.

The popularity of INM was further amplified through the power of social media. It helped to give this operation an international echo and visibility, and then bypass traditional media.[16] It is social media that helped to reinforce this movement and provide it with political legitimacy. Hence, it helped Indigenous peoples to touch the Canadian public opinion; a poll showed that two thirds of Canadians have heard about the INM movement.[17] Twitter also helped to create bonds and unity between Canadian Indigenous peoples that might have previously been divided.[18]

Without an internet connection, Inuit and others Indigenous populations of the North American Arctic would not have been able to join the movement in the cyber world. In fact, it allowed them to become an important part of it, despite living far away from the rallies and marches that were taking place further in the south.

Even if internet is slow, expensive and has data caps in the Arctic, the examples above show how it has already changed the lives of many northerners and especially the Inuit, but many others example exist. The completion of several submarine cables bringing a cheaper and more reliable internet broadband connection, could initiate more changes in northerners' lives and help them to fully benefit from what internet can offer.

Arctic Submarine Cables Projects to Come

There are five submarine fibre optic cable projects in the Arctic that have been announced so far. Each one has a different goal: either to connect the Arctic regions and/or to connect Asia, Europe and North America (mostly for data centers and stock exchange markets). However, plans to lay fibre optic cables through the Arctic have previously been scrapped, which draws skepticism to the new projects today.[19] The idea is not new, though no-one has managed to lay a cable beneath the Arctic Ocean either in the Northwest or the Northeastern passages. The completion of these projects is a real challenge with not only technological but also financial risks. Those cables require large investments with no guarantee of successful results.

Northwest Passage (Quintillion, Nuvitik, Kativik)

The most advanced of all the projects is the Quintillion Network submarine cable, which continued as the Arctic Fibre project after Quintillion purchased it in 2016,[20] carrying a slightly different design. The first part of the cable, phase one, was laid during the summer of 2016, close to the coast of Alaska, connecting five villages,[21] and at the end of the summer of 2017: Prudhoe Bay in Arctic Alaska. Phase one was announced 'Ready For Service' (RFS) by December 1st 2017.[22]

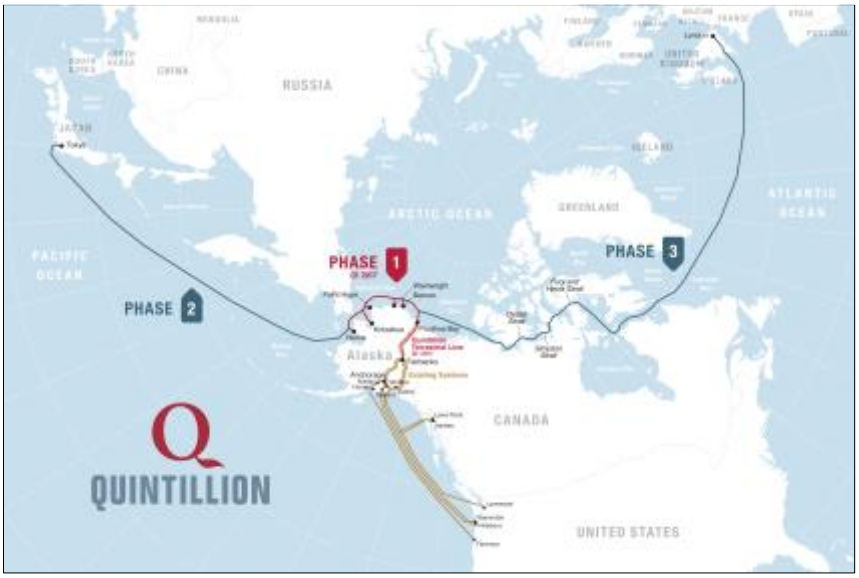

Figure 2. The Qunitillion submarine cable route detailed in three phases

In phase two and three, the cable will connect Japan to Great Britain through the Northwest Passage (NWP), therefore connecting the major stock exchanges of the northern hemisphere, while connecting some of the Indigenous communities along the way in the NWP for a much cheaper price than satellite and microwave.[23] The main investor of Quintillion is Len Blavatnik[24], originally from Ukraine and also the owner of Warner Music.

A Québec based company, Nuvitik, wants to give all the Inuit communities of Nunavut the possibility to have access to broadband internet via its Ivaluk Network, and for a much lower price than satellite. Driven by social concerns, this non-profit project is awaiting funding from the Canadian federal government before it can go ahead. To date, the company has not received any money from the federal or the territorial government to kick-start its project.

The other Canadian project, Eastern Arctic Undersea Fibre Optic Network (EAUFON), is led by the Kativik Regional Government (KRG) in northern Québec (Nunavik). Quite similar to the previous project, EAUFON is seeking to connect 24 communities of Nunavik, Nunavut and Nunatsiavut to broadband internet via a submarine cable. In October 2016, the KRG awarded a contract to WFN Strategies to lead a feasibility study and risk assessment.[25]

Greenland

The west coast of Greenland will soon have a second submarine cable called Greenland Connect North, aiming to connect Nuuk, Maniitsoq, Sisimiut and Aasiaat to broadband internet.[26] It should be RFS by December 2017. This completes the first submarine cable that connects Greenland to North America (via Newfoundland) and Europe (via Iceland) since 2009. TeleGreenland continues to invest in its infrastructure in order to bring broadband internet to more Greenlandic communities.

Northeast Passage

In the Russian Arctic, a submarine cable project called Arctic Connect aims to connect Asia, Russia and Europe via the Northeast Passage (NEP), by 2022. This project, evaluated at $700 million USD, is developed by Cinia Group, a company that is 77% state-owned by the Finnish government who is also backing this project.[27] With this cable, Finland hopes to further improve its internet network and consequently become a major data hub.[28]

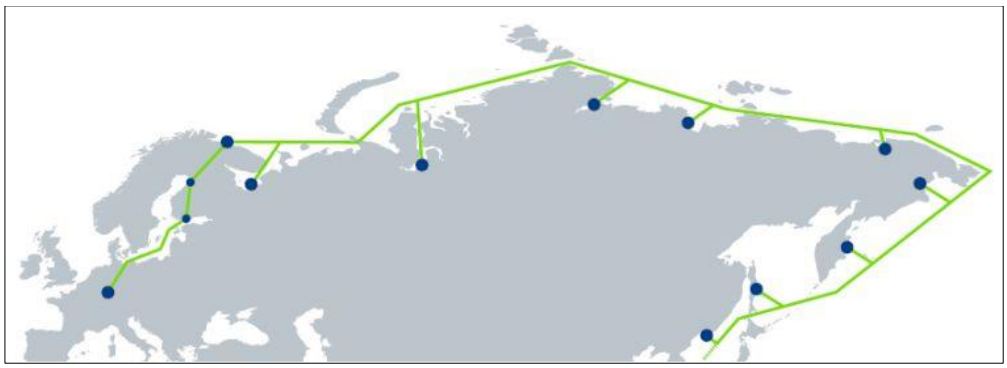

Figure 3. The Arctic Connect planned route through the North-East Passage

Arctic Connect will include a partnership between Finland, Norway and Russia, all three of which are extremely interested in having this cable in their Arctic regions. The project is supported at the political level by Russia since being discussed during a meeting between the Prime Ministers of Finland and Russia in December 2016.[29] Since then, the Russian Ministry of Communications and Mass Media has released a statement declaring that it will support the project, while Polarnet and Cinia will create a joint venture to lay this cable in the NEP.[30] It seems that the Russian company, Polarnet Project, created in 1999 to lay a cable in the Russian Arctic, is still in the race after a few years of intermission. This cable could help Russian authorities to further develop the NEP, a highly strategic area for the Russian government.

Recently, China also showed interest in this cable during a meeting between the Russian Minister of Communications and Mass Media, Nikolai Nikiforov, and Chinese Minister of Industry and Information Technology, Miao Wei, in July 2017, offering to cooperate on the project.[31]

Conclusion

Indigenous peoples, including the Inuit, have already adopted internet and social media because they understand its virtue in terms of political influence, its social-economic advantages for northern rural towns and villages. Without internet access, Arctic issues may have remained isolated from the South, with limited exposure and political weight to influence public opinion.

The five submarine fibre optic cables seeking to bring broadband internet connection to the top of the world may continue to change the lives of northerners by allowing them to benefit from all that the internet can offer such as tele-health, tele-education, e-government, e-business, and maybe even attract new investors to the Arctic as data centers companies. Ultimately, the cyber world will help Indigenous peoples defend their cultures and educate and distribute information about their traditional way of life with a larger audience using social media.

Due to the ongoing thawing sea-ice, the Arctic Ocean is predicted to be increasingly open to the impacts of globalization; not only because of tourism, shipping or oil and gas extraction, but also because of new internet highways, hopefully in turn connecting Arctic inhabitants, allowing them to protect their culture while becoming closer to the connected world.

Notes

1. See Finland's Chairmanship of the Arctic Council, 2017-2019: http://formin.finland.fi/public/default.aspx?contentid=356546.
2. In *The State of Broadband 2016* report, prepared by the UN Broadband Commission for sustainable development, released every year since 2012, was pointed out that still half of the world population is not connected to internet (roughly 3,9 billions). Moreover, those populations are mostly the poorest living in very remote areas and are often minorities.
3. Arctic Council Task Force on Telecommunications Infrastructure in the Arctic (TFTIA).
4. See Arctic Economic Council (AEC), https://arcticeconomiccouncil.com/wp-content/uploads/2017/02/AEC-Report_Final-LR-1.pdf.

5. See Arctic Council, https://oaarchive.arctic-council.org/bitstream/handle/11374/1924/2017-04-28-ACS_Telecoms_REPORT_WEB-2.pdf?sequence=1&isAllowed=y.
6. See CRTC Telecom Regulatory Policy, 2016-496, http://www.crtc.gc.ca/eng/archive/2016/2016-496.htm.
7. Created in 2007 in the US, in 2013 for Canada.
8. See Annie Zak (2016, 31 March). Amazon Prime Eases Rural Alaska Pricey Shipping Woes. *Alaska Dispatch News*. Retrieved from, https://www.adn.com/business/article/amazon-prime-eases-rural-alaskas-pricey-shipping-woes/2015/12/20/.
9. See CBC Radio, http://www.cbc.ca/radio/spark/326-the-pain-of-paying-tracking-babies-and-more-1.3752999/why-losing-the-pain-of-paying-could-end-up-hurting-1.4124696.
10. See Sarah Rogers (2015). No More Free Shipping to Most Nunavut, Nunavik Communities: Amazon. *Nunatsiaq News*. Retrieved from, http://www.nunatsiaqonline.ca/stories/article/65674no_more_free_shipping_to_most_nunavut_nunavik_communities_amazon/.
11. See *Feeding My Family:* https://www.facebook.com/groups/239422122837039/
12. See *Feeding My Family:* https://www.facebook.com/photo.php?fbid=1470590112979035&set=gm.1346537258792181&type=3&theater
13. See *Feeding My Family:* https://www.facebook.com/photo.php?fbid=10158849114520655&set=gm.1304642406315000&type=3&theater.
14. *A data cap (bandwidth cap) is a service provider-imposed limit on the amount of data transferred by a user account at a specified level of throughput over a given time period, for a specified fee. The term applies to both home Internet service and mobile data plans.* http://whatis.techtarget.com/definition/data-cap-broadband-cap
15. They are Nina Wilson, Sheelah Mclean, Sylvia McAdam and Jessica Gordon.
16. See Christina Coolidge (2013). Idle No More: An Example of the Power of Social Media. *Simon Fraser University (SFU)*. Retrieved from, http://www.sfu.ca/olc/blog/indigenous-community-stories/idle-no-more-example-power-social-media.
17. See UPI (2013). Poll: Canadians Aware of Idle No More. Retrieved from, http://www.upi.com/Top_News/World-News/2013/01/24/Poll-Canadians-aware-of-Idle-No-More/UPI-52151359070479/?spt=hs&or=tn.
18. See Karissa Donkin (2013). Social Media Helps Drive Idle No More Movement. *Toronto Star*. Retrieved from, https://www.thestar.com/news/canada/2013/01/11/social_media_helps_drive_idle_no_more_movement.html.
19. For those cables, see Michael Delaunay (2014). The Arctic: A New Internet Highway? In L. Heininen, H. Exner-Pirot & J. Plouffe (Eds). *Arctic Yearbook 2014*. Northern Research Forum. Akureyri, Iceland. Retrieved from, https://www.arcticyearbook.com/images/Arcticles_2014/BN/Delaunay_AY_2014_FINAL.pdf.
20. See Tim Woolston (2016). Arctic Fibre Acquired by Quintillon Networks. *Alaska Native News*. Retrieved from, http://alaska-native-news.com/arctic-fibre-acquired-by-quintillion-networks-22765.

21. Nome, Kotzebue, Point Hope, , Wainwright, Utqiaġvik
22. See Alan Burkitt-Gray (2017). CEO Quits at Arctic Operator Quintillon. GTB. Retrieved from, https://www.globaltelecomsbusiness.com/article/b149hfrv4w03ml/ceo-quits-at-arctic-operator-quintillion?copyrightInfo=true.
23. See MRA: http://mustreadalaska.com/quintillion-ceo-new-one-project-nears-completion/.
24. See MRA: http://mustreadalaska.com/len-blavatnik-governor-helping/.
25. See TeleGeography (2016). Cable Compendium. Retrieved from, https://www.telegeography.com/products/commsupdate/articles/2016/10/14/cable-compendium-a-guide-to-the-weeks-submarine-and-terrestrial-developments/.
26. See Huawei Marine: http://www.huaweimarine.com/marine/marine/commonWeb.do?method=showContent&webId=508.
27. At least since 2016 with the released of a report prepared by the former Prime Minister Paavo Lipponen, about the opportunity to lay a submarine cable through the Arctic Ocean. See *Report on the Northeast Passage Telecommunications Cable Project.* Retrieved from, https://www.lvm.fi/documents/20181/880507/Reports+3-2016.pdf/db8fcdda-af98-4a50-950d-61c18d133f74.
28. See Thomas Nilsen (2016). Trans-Arctic Fibre Cable Can Make Kirkenes to High-Tech Hub. *The Independent Barents Observer*. Retrieved from, https://thebarentsobserver.com/en/industry-and-energy/2016/12/trans-arctic-fiber-cable-can-make-kirkenes-high-tech-hub.
29. Ibid.
30. See Ofweek: http://en.ofweek.com/news/Russian-govt-to-support-trans-Arctic-cable-deployment-45944.
31. See The Arctic: http://arctic.ru/international/20170731/650577.html.

References

Broadband Commission for sustainable development (2016). *The State of Broadband 2016, Broadband Catalyzing Sustainable Development* (Report). *United Nations.* Retrieved from, from, http://www.broadbandcommission.org/Documents/reports/bb-annualreport2016.pdf.

Canada Public Policy Forum (June 2014). *Northern Connections, Broadband and Canada's Digital Divide.* (final report). Retrieved from, http://www.ppforum.ca/splash.htm.

Delaunay, Michael (2014). The Arctic: A New Internet Highway? In L. Heininen, H. Exner-Pirot & J. Plouffe (Eds). *Arctic Yearbook 2014*. Northern Research Forum. Akureyri, Iceland. Retrieved from, https://www.arcticyearbook.com/images/Arcticles_2014/BN/Delaunay_AY_2014_FINAL.pdf

Fiser, Adam. (2013). *Mapping the Long-Term Options for Canada's North, Telecommunications and Broadband Connectivity* (Report), Centre for the North, The Conference Board of Canada. Retrieved from, http://www.conferenceboard.ca/e-library/abstract.aspx?did=5654.

Imaituk Inc. (2011, April 30). *A Matter of Survival, Arctic Communications Infrastructure in the 21st Century.* (Arctic Communications Infrastructure Assessment Report). Prepared for the Northern Communications & Information Systems Working Group, Canadian Northern Economic Development Agency, Canada. Retrieved from, http://www.aciareport.ca/.

ITU (September, 2016), *The State of Broadband 2016: Broadband catalyzing sustainable development*, ITU/UNESCO Broadband Commission for Sustainable Development. Retrieved from, http://www.broadbandcommission.org/Documents/reports/bb-annualreport2016.pdf.

Lipponen, Paavo & Reijo Svento (2016). *Report on the Northeast Passage Telecommunications Cable Project.* Ministry of Transport and Communications, Finland. Retrieved from, https://www.lvm.fi/documents/20181/880507/Reports+3-2016.pdf/db8fcdda-af98-4a50-950d-61c18d133f74.

Nordicity (January, 2014), *Northern Connectivity Ensuring Quality Communications.*

Northern Communications Information Systems Working Group, Government of Yukon. Retrieved from, http://arcticjournal.com/sites/default/files/ncis_wg_report.pdf.