

Reference: Beaton, B., Burnard, T., Linden, A. & O'Donnell, S. (2015). Keewaytinook mobile: An Indigenous community-owned mobile phone service in northern Canada. In L. Dyson, S. Grant & M. Hendriks (eds.), *Indigenous People and Mobile Technologies*, Routledge. Sydney, Australia, 109-124.

Keewaytinook Mobile: An Indigenous Community-Owned Mobile Phone Service in Northern Canada

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INTRODUCTION

This is the story of Keewaytinook Mobile, a not-for-profit mobile (cellular) phone service built, owned and operated by small, remote, politically-autonomous Indigenous (First Nation) communities in northern Ontario, Canada. The people and their ancestors have lived here for thousands of years. The terrain is beautiful and harsh; summers are hot but in winter, the longest season, temperatures regularly fall below minus 30 Celsius. There are no permanent roads in this region; the Indigenous communities are accessed by small aircraft. The communities generate their own electricity using diesel fuel hauled in on temporary roads built in the winter on the frozen landscape.

Keewaytinook Mobile (KMobile) was created because the Indigenous people in this region wanted it, and they built it themselves because nobody else was going to do it. The KMobile idea began when the leadership of one of the Indigenous communities asked their tribal council Keewaytinook Okimakanak to include mobile services in their network plans. Keewaytinook Okimakanak knew it would be a significant challenge but believed they had the capacity to do it; their telecommunications division KO-KNET had already built and was operating the largest Indigenous-owned telecommunications service in the world.

This story is mostly about the development of the KMobile service infrastructure and why these Indigenous communities own and operate their information and communications technology (ICT) infrastructure to support their capacity development and self-determination goals. KMobile exists in a country in which there are profound and unacceptable social and economic divisions between Indigenous peoples and the non-Indigenous population, a situation condemned by the United Nations (Anaya 2014). Despite Canada's reluctant ratification of the United Nations Declaration on the Rights of Indigenous Peoples in 2010, the federal government has continued its ongoing practice of neglect and underfunding of Indigenous communities, especially communities in the remote northern regions that remain "out of sight out of mind" until the next crisis situation hits the national news. The political and socioeconomic context of KMobile and Indigenous communities in northern Canada is an important part of this story and so that is where it will start.

SETTLER COLONIALISM IN CANADA AND OCAP AS AN ICT RESPONSE

In May 2014 James Anaya, United Nations Special Rapporteur on the Rights of Indigenous Peoples, released his damning report on the “distressing socio-economic conditions of indigenous peoples in a highly developed country” (Anaya 2014, 7). The UN report lists a wide range of human rights issues and crisis situations across Canada. Many Indigenous communities, especially in remote northern regions, are experiencing widespread poverty, high rates of unemployment and chronic diseases, severe housing shortages and overcrowded housing, an underfunded education system influenced by the legacy of the residential school system, unsafe drinking water that poses a serious health risk to residents, and many other crises. For millennia, the Indigenous people in these northern regions survived as hunters and gathers with strong connections to the land and all that it provides; it is only in recent history that they are living on small reserve lands with limited access to the resources needed to develop their communities. In the words of the housing manager in a remote Indigenous community interviewed recently by the authors: “We receive just enough to fail.”

Despite the challenges, Indigenous peoples are not failing but rather resisting, increasing their resilience, and creating resurgence with a strong connection to their lands and resources. Many are building their own community infrastructure – such as KMobile – managing their education and health systems and many other essential services to keep their communities thriving and expanding. The birth rate in Indigenous communities is well above that in non-Indigenous communities across Canada. In the decades leading up to the UN report, confrontations have increased between Indigenous peoples and the Canadian state over land rights, treaty rights, and protection of water and other natural resources. On the intellectual front, analysis of “settler colonialism” is helping Indigenous academics and their non-Indigenous allies explain how it is possible that many Indigenous communities in Canada are experiencing such appalling levels of poverty and underdevelopment. At the community level, the application of the principals of OCAP – Ownership, Control, Access, and Possession – across an increasing number of applications is revolutionizing how communities are taking charge of their infrastructure, governance structures, information, and knowledge.

Indigenous authors from across Canada are leading the analysis of settler colonialism, including Taiiaki Alfred (2009), Marie Battiste (2013), Jeff Corntassel (2012), Glen Coulthard (2014), Pamela Palmater (2011) and Leanne Simpson (2012) among others. A settler colonialism lens sees that Canadian state policies are designed to remove Indigenous peoples from their traditional lands so that the resources can be extracted for economic gain. Resources taken from Indigenous lands maintain the Canadian economy and the high standard of living experienced by non-Indigenous Canadians, the majority of whom live in large, southern urban centres dependent on these resources.

OCAP – Ownership, Control, Access, and Possession – was originally a theory developed by First Nations to apply self-determination to research (Schnarch 2004) and was adopted at the national level by Indigenous leaders in Canada (Assembly of First Nations 2007). As originally conceived, OCAP is an Indigenous response to the role of knowledge production in challenging colonial relations. OCAP principles or self-determination applied to telecommunications and

broadband networks, has at least two implications. First, Indigenous communities must retain access and possession of the capacity and resources to effectively manage the content, traffic and services on their local network. Second, Indigenous communities have a right to own and control the local broadband network in their communities in order to support the flow of information and services (Kakekaspan et al. 2014).

OCAP applied to telecommunications is captured in the “First Mile” and “e-Community” approaches to broadband development in remote and rural Indigenous communities (McMahon et al. 2014). “First Mile” refers to the development of local telecommunication infrastructure that benefits local communities, in contrast to how local infrastructure is often referred to as “last mile” development that benefits centralized, urban-based telecom corporations and governments. Authors Beaton, Seibel and Thomas (2014) have analyzed how community-owned broadband networks and applications are at the core of the social economy in remote Indigenous communities. Ownership and control of the local broadband networks and associated services are vital to self-determination and local community resilience; local ownership of community networks is a critical component of the “First Mile” (McMahon et al. 2011). Implementing First Mile at the Indigenous community level in Canada involves an e-Community approach whereby the communities own and maintain their local broadband infrastructure; the associated benefits such as local employment, revenues and capacity are requirements in local efforts to counter settler colonialism (Beaton and Campbell 2014, Whiteduck 2010).

An important part of the “First Mile” work is to change the policies directing the allocation and management of public funds for broadband infrastructure developments. Canadian governments spend significant public funds on telecommunications infrastructure in remote and rural regions. However, with rare exceptions, the public funds flow directly to corporate telecommunications companies with little consultation or oversight by the communities the networks are supposed to serve. As has been noted elsewhere: “the direct provision of public subsidies to corporate telecommunications companies leaves little recourse for community action” (McMahon et al. 2014, 251).

The problem with giving public infrastructure funds directly to corporations instead of local communities to manage can be illustrated by one recent example. Between 2010 and 2014, the federal and provincial governments spent more than \$60 million to build a new fibre transport network in northwestern Ontario, to serve Indigenous communities and also mining and other extractive industries in the region. However, rather than funding the Indigenous communities the public funds flowed to the only national telephone company serving this region to build and operate their own new fibre transport network (Philpot, Beaton and Whiteduck 2014). The communities linked by the new fibre network now must purchase their transport services from this provider at a cost far above that charged in urban centres, costs that make it very challenging for the Indigenous communities to deliver affordable services that depend on the network, including the KMobile service, local internet service, telehealth, school connectivity and other services. In addition, the telephone company left five of the originally proposed remote communities off their fibre network, claiming it required additional public funding to reach them. This is one of many examples of the colonial and capitalist approaches to regional telecom development that enrich corporations and miss an opportunity to build capacity in local communities. This corporate approach is now being challenged by Indigenous groups and their

allies through a new non-profit organization, the First Mile Connectivity Consortium, which is making interventions with regulatory bodies so that infrastructure development will truly benefit remote Indigenous communities (McMahon, Hudson and Fabian, 2014).

LOCAL OWNERSHIP OF TELECOMMUNICATIONS IN THE REMOTE KEEWAYTINOOK OKIMAKANAK COMMUNITIES

The Indigenous owned and controlled KMobile service began in the Sioux Lookout zone of northwestern Ontario, an area about the size of France that supports 26 remote and isolated Indigenous communities. For most of the year, the only way to reach these communities is by small planes. The communities are small, with average populations of about 450 people, and politically autonomous; each is governed by an elected chief and council responsible for not only political governance but also delivering the full range of services and activities necessary for any community to function – from education, public works and health services to justice, policing, recreation activities and more. The terrain is Canadian Shield and tundra – rocks, water, bog and vast forests – rich in wildlife, resources, and thousands of years of Indigenous history. Until a generation ago, the extensive water networks of rivers and lakes were the primary means of transportation, supporting networking, communication, and a special way of life deeply connected and dependent on the land and everything it provides. The lands and waterways continue to sustain the lives of the Indigenous people who live here today.

Five of these remote Indigenous communities with year-round residents – Fort Severn First Nation, Keewaywin First Nation, North Spirit Lake First Nation, Poplar Hill First Nation and Deer Lake First Nation – are members of the Keewaytinook Okimakanak tribal council. Keewaytinook Okimakanak (“Northern Chiefs” in the Oji-Cree language) is governed by the chiefs of its member communities. Deer Lake with 1,000 residents is the largest and the others have resident populations between 400 and 500. Keewaytinook Okimakanak is an intermediary organization; among its functions is to support infrastructure development in its member communities (McMahon et al. 2014). It provides second-level support services, including KO Health, KO Education and notably, a series of technology-supported services: the Keewaytinook Internet High School (KiHS) (Potter 2010, Walmark 2010), KO Telemedicine (KOTM) (Williams 2010) and the flagship Kuhkenah Network (KO-KNET), the most extensive Indigenous-owned telecommunications service in the world (Carpenter 2010).

Since its birth in 1994 as a bulletin board service (BBS) to connect students in six remote Indigenous communities with each other, KO-KNET has leveraged strategic funding and partners to create a vast telecommunications network and digital services organization now serving more than 80 Indigenous communities across Ontario. Based in Sioux Lookout, Ontario, KO-KNET services include Internet connectivity, a managed videoconferencing network, the Northern Indigenous Community Satellite Network (NICSN), supporting KiHS (Internet high school) and KOTM (telehealth) and a range of other broadband-enabled services, training and related activities. The remarkable story of KO-KNET has been the focus of five doctoral theses and several university-based research projects resulting in numerous publications (for example: Beaton, Fiddler and Rowlandson 2004, Carpenter 2010, Fiser and Clement 2010, McMahon 2014, O’Donnell et al. 2013). KO-KNET is one of the few examples of an Indigenous

organization receiving public funding to build telecommunications infrastructure; as a non-profit, community-run organization, they have ensured that the funding flows directly to and benefits the communities.

KO-KNET has been a pioneer in the First Mile and eCommunity approaches, working with the five remote Keewaytinook Okimakanak communities to build community digital infrastructure from the ground up. The eCommunity approach envisions broadband as a community-owned infrastructure; decisions are made about broadband connectivity at the community level. Each of the five remote Keewaytinook Okimakanak communities owns their cable network that delivers Internet connectivity to the homes. Four of the communities recently switched to fibre transport that replaced the microwave broadband transport and delivers much faster Internet connectivity. These four communities own their own local fibre network that is now included in their cable network delivering improved connectivity services to the health centre (for telehealth) and the school. Fort Severn, the most remote community and satellite served, is currently planning to develop its local fibre network. All five communities run their own local KMobile service in partnership with KO-KNET.

THE DEVELOPMENT OF KMOBILE AS AN INDIGENOUS COMMUNITY-OWNED SERVICE

In early 2000, George Kakekaspan was chief of Fort Severn First Nation when the Keewaytinook Okimakanak First Nations won the competition to be the Canadian “Aboriginal Smart Communities” demonstration project (Carpenter, 2010). As plans were rolling out to build and operate their broadband community networks, Chief Kakekaspan requested that mobile services be considered as an essential service for his community as part of this project. It would take another seven years before affordable hardware and software became available that supports the OCAP principles and these small Indigenous communities could begin developing their locally owned and managed mobile networks.

In early 2007, Keewaytinook Okimakanak’s KO-KNET responded to a request for proposals to develop mobile services in the remote First Nations across northwestern Ontario, Canada. At the time, the federal and provincial governments were searching for cellular providers or groups willing to develop mobile services across this sparsely populated region. This work was to close-the-mobile-gap and create new economic and social opportunities in the existing communities and for new business ventures such as mining and forestry. The government decided to fund KO-KNET to create a pilot project with two remote Indigenous communities to demonstrate the feasibility and operation of the proposed community owned mobile service. KO-KNET obtained a grant of \$1 million from the Ontario government and another grant of \$100,000 from the federal government, and each of the partner Indigenous communities contributed their lands, equipment, operators, and support for the development of the mobile pilot project.

This pilot project successfully demonstrated that the proposed hardware and software could operate over the existing microwave transport in the case of one of the communities (Keewaywin First Nation) and satellite transport in the case of the second partner community (North Caribou Lake First Nation). The pilot project also helped to establish a strategic development partnership

with the regional Dryden Municipal Telephone System (DMTS) to use their mobile/cellular hub to service the Indigenous communities using KMobile. The DMTS partnership with KO-KNET and the use of the KO-KNET mobile hub equipment as a redundant backup system was strategic for everyone working together to build and sustain this new mobile network service.

Initial pilot project meetings with the Indigenous leadership and community members resulted in the decision to double the height of the proposed 100-foot towers. From every person consulted about this new service, the team heard the same first question: “How far will the signal reach?” Community members told story after story about the challenges they faced when working outside their communities on the land and on the water systems and concerns about safety for themselves and their loved ones. The contractor advised the KO-KNET team that by doubling the height of the tower, the reach of the signal could potentially be tripled dependent on the signal strength of both the receive and transmit devices. So plans were made to purchase 200-foot towers; tower and telecommunication building sites were selected with the chief and council to address electrical, connectivity, height of land, and ease of construction factors.

The two towers and assembled telecommunication buildings were ordered and shipped on the 2008 winter road to Keewaywin and North Caribou First Nations. The winter was unseasonably warm and short; despite concerns that the winter road would not be stable enough to support the transit of the towers and buildings, they made it safely. The two communities worked with the contractors to prepare the sites, erect the towers, position the telecom buildings, mount the antennas and cabling between the antennas and the building and ensure the equipment was operational (Figure 1). Next, KO-KNET worked with DMTS, the regional telephone company partner, to provide the telephone lines to the site for local dialing, establish the IP connection from the community headend to the mobile/cellular site and connect the electrical system to the community grid.



Figure 1: *The new mobile/cellular headend in Keewaywin First Nation, 2008 (photo credit KO-KNET)*

After that work was completed, KO-KNET worked with the two Indigenous communities to set up the mobile radio equipment and backup electrical storage system. The connections were completed for the local mobile site making it operational by the autumn of 2008. Training sessions were an integral component for this development with workshops delivered by the hardware and software producers held in Sioux Lookout and Dryden for the KO-KNET team and the community partners. KMobile successfully obtained the 850mhz wireless spectrum from the national provider that had been given this space by the federal government but had no plans to use it in this region because the Indigenous communities did not meet their population requirements. Roaming and network agreements were signed to support the operation of their mobile phones in the Indigenous communities.

With the successful demonstration that these technologies could work in these remote communities, the Keewaytinook Okimakanak leadership (community chiefs) directed KO-KNET to construct similar mobile sites in the remaining four Keewaytinook Okimakanak First Nations (Deer Lake, Fort Severn, North Spirit Lake, and Poplar Hill). These four sites were turned on by the autumn of 2009 (Figure 2).



Figure 2: *Installing the cell tower in Fort Severn First Nation, 2009 (photo credit KO-KNET)*

For much of the four-year period from autumn 2008, when KMobile began operating, the service managed to successfully grow and deliver its mobile cellular service across the region. Throughout this period, KO-KNET created websites to document both the pilot project (KO-KNET 2008) and the KMobile developments (KO-KNET 2014). Many stories about the importance of the service were experienced and shared, and plans were made to put this service into other remote Indigenous communities in the region interested to join the network. KO-KNET prepared another funding application and the Ontario government provided nearly \$4.8 million for 10 additional Indigenous communities to work with KO-KNET to build their own KMobile service. By the end of this second project in 2012, KO-KNET levered this investment to include eight additional remote First Nations for a total of 20 communities operating the KMobile service (Figure 3). But new challenges were about to emerge for KMobile.

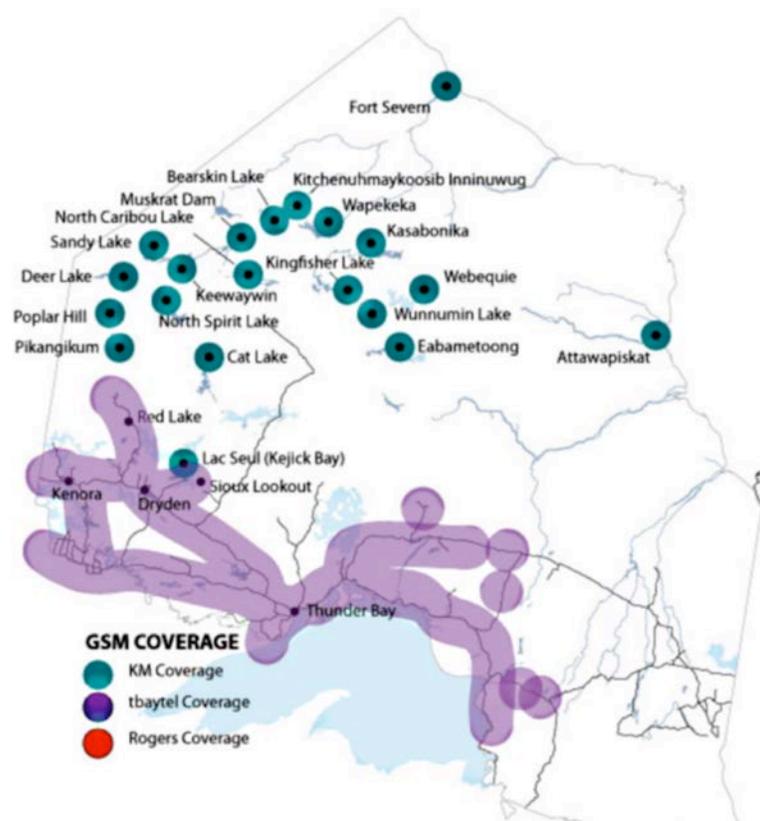


Figure 3: Northwestern Ontario: KMobile coverage in Indigenous communities and roaming partner coverage (graphic credit KO-KNET)

In autumn 2012, the municipality of Dryden decided to sell its DMTS telephone service to TBayTel. This development meant that KMobile had to decide whether to take on the development and management of the former DMTS hub site that was servicing KMobile or to simply walk away from continuing to provide this service. After consulting with the Indigenous community leaders, everyone agreed to keep the service operating. KMobile completed the transition from DMTS to a fully operated and managed mobile service, including becoming a licensed telecommunications provider capable of supporting roaming agreements with other mobile providers. The operation of the hub site meant additional work for the KO-KNET network team with additional staff being required. KMobile entered new agreements and

partnerships with GSM network services and hired a consulting team to assist with the transition and business case for the KMobile operation and maintenance.

The KMobile business model now involves a pay-as-you go arrangement for customers that includes a \$12 per month charge for infrastructure maintenance and development (Figure 4). All calls made are charged to the customers with a percentage returned to the Indigenous communities in which the calls originated. Revenues from calls made while roaming outside the communities benefit the network as a whole. Two authors of this chapter, staff members of Keewatinook Okimakanak, developed the new billing software required to support the KMobile users to use the service both while on the network and roaming on other mobile networks. This software development has saved KMobile hundreds of thousands of dollars by avoiding the need to purchase and manage an existing billing software system. Similarly the KO-KNET team is implementing a new online accounting system for individual users to further support KMobile clients.

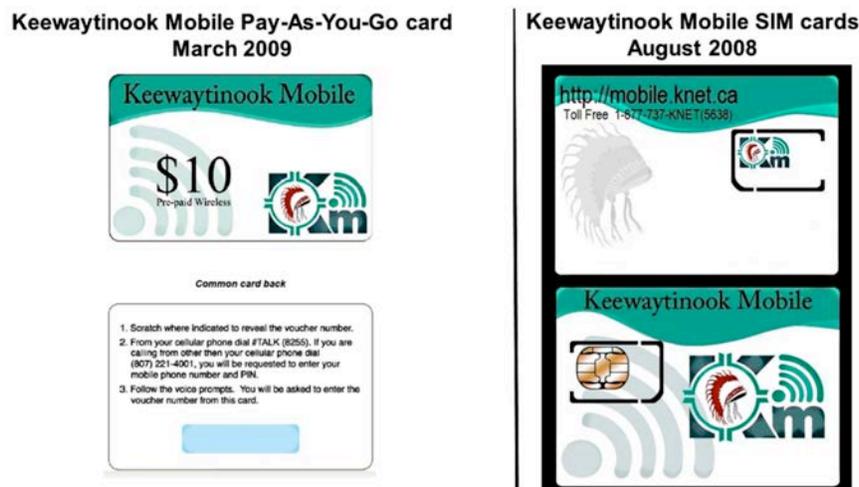


Figure 4: KMobile SIM card and pay-as-you-go card (photo credit KO-KNET)

INDIGENOUS COMMUNITY MEMBER USE AND EXPERIENCES OF KMOBILE

The authors have conducted three separate studies to gather Indigenous community member feedback on KMobile and other community-owned telecommunications services. The first included interviews with 42 community members in Fort Severn First Nation in early 2010, shortly after their KMobile service was switched on. Our study described their perspectives and experiences of KMobile in its early days (O'Donnell et al. 2011).

Fort Severn First Nation, the northernmost community in Ontario, is located on the Severn River a few kilometres from where it flows into Hudson Bay (see Figure 2). About 400 people live in Fort Severn most of the time, half of whom are adults. Four months after KMobile was operational, about 50 residents had purchased KMobile phones and were buying pre-paid phone cards. More

residents may have been using the KMobile roaming agreements with other phone companies, and in addition, many residents (41% of those interviewed) were borrowing mobile phones from others or lending their phones; it was impossible to obtain a definitive number of KMobile “users” in the community. About 20% of those interviewed in those early days used a mobile phone daily, and texting was more popular than voice calls.

The most common reason for using a mobile phone in Fort Severn was safety and security when out on the land – hunting, trapping, fishing or gathering wild food. The range of the KMobile service was of critical interest and importance – for example trappers wondered if the signal would reach their traditional traplines. Other reasons for using KMobile included being easy to contact when moving around in the community, or for fun, and the novelty of texting people. Reasons given for not wanting a mobile phone were the cost (it was not a priority); not wanting to be easily contacted, or not seeing the need for it; for example, one comment was: “For a community like Fort Severn, if I want to talk to someone, I just go over to their house. It’s just a small community” (O’Donnell et al. 2011, 670).

In late 2011, the authors conducted an online survey of community members in the Sioux Lookout zone that resulted in 663 responses, including 131 responses from people living in the five remote Keewaytinook Okimakanak communities; the methodology for that survey is described in several publications (Carpenter et al. 2013, Molyneaux et al. 2014, Walmark et al. 2012). Again in early 2014, the authors conducted a second online survey, this time with responses from 210 residents in the remote Keewaytinook Okimakanak communities; the methodology for the second survey is described in two conference papers (Beaton and Carpenter 2014; Beaton, Seibel and Thomas 2014). The data related to KMobile in the KO communities from these two surveys has not previously been published and will be discussed here.

The 2011 survey was conducted about one year after the KMobile service had been switched on in the five remote Keewaytinook Okimakanak communities. At that point, 38% of the respondents were texting and 21% were making a voice call on a mobile phone every day. About 20% were using the Internet on their mobile phone daily – this would have been via a WiFi connection on a smartphone, as KMobile infrastructure supports voice and text only. One respondent commented: “Good job on getting cell service up north, that made my year when I moved back to the community and found cell service, I would have been 'lost' without internet and cell and I probably wouldn't have stayed to live there without it.”

Of the 131 remote Indigenous community respondents in the 2011 survey, 50% were current KMobile customers and 63% indicated they planned to use the service in the next year. In response to the statement “KMobile offers safety and security when out on the land,” 61% agreed and 34% did not know. More than half (56%) gave KMobile a good or excellent rating and 28% rated it fair; 12% responded: “I don’t know what this service is.” When asked to describe the cell (mobile) phone service in their community; the responses were: Good: sometimes no coverage or dropped calls but good overall (45%); fair (23%); don’t know (14%); excellent, always works (11%); and poor, hard to access, many dropped calls (6%). In response to the question: “What do you need to use technology more effectively?” 52% responded: “Better cell (mobile phone) range.”

When the 2014 survey was conducted, KMobile had been operating in each of the five Keewaytinook Okimakanak communities for at least four years. In the survey, more than half (54%) of respondents were “very comfortable” using a mobile phone and 34% were “comfortable.” More than a third (39%) were “very comfortable” with a smartphone and the same number were “comfortable.” Every day 35% were texting, 24% were making a voice call on their mobile phone and 38% were using the Internet on their mobile phone; again, this would have been through a WiFi connection on a smartphone. In addition, 44% indicated they go online daily using a mobile device.

Similar to the situation in 2011, in 2014 50% indicated they were current KMobile customers, with 58% indicating they planned to use the service in the next year. In response to the statement, “KMobile offers safety and security when out on the land,” 68% agreed, an increase from 2011 (61%). Among the many positive comments received about the KMobile service was: “For a person that doesn’t use KMobile, I still recommend very strongly to keep it going because a lot of people depend on it in the communities.” In the survey, 79% agreed with the statement: “KMobile is an important service in our community.” In response to the question: “What do you need to use technology more effectively?” 52% responded: “Better cell (mobile phone) range,” and 52% responded “Internet on mobile phone.”

Several stories have been documented about how the KMobile service has been vital for medical emergencies. One concerns a woodcutter, Timothy Apetawakeesic, whose calls for help using his KMobile phone were answered after a tree-cutting accident. He had multiple fractures in his leg after a tree fell on him near Weagamow Lake First Nation in late winter 2012. “That’s how I survived – the cellphone,” said the fortunate man in an article written about the incident (Garrick 2012). The same magazine article mentioned another incident in which a man repairing his vehicle in a remote location caught his hand in a car jack and used his mobile phone to request urgent assistance. Another story documented how during the Ontario provincial election in 2011 the Anik F2 satellite malfunctioned and the telephone services went down in the satellite-served communities, preventing the election officials in Toronto from accessing the polling results using their traditional telephone-based strategies in these remote communities. At the same time, the KMobile phones were working in these communities using a different C-Band satellite, Anik F3, making it possible for election officials to use these local networks to reach the local election officials so their votes could be counted (McMahon 2011).

CONCLUSION

Two of the authors are writing this chapter in July 2014, during a month-long visit to the five remote Keewaytinook Okimakanak communities. KMobile is obviously a part of the everyday lives of the Indigenous community residents. In each of the communities, essential services continue throughout the summer, staffed by Indigenous community members in the band offices, health centres, community centres, e-Centres and community stores; the maintenance workers are outside keeping the airports functioning, the electricity generators going, the roads graded, and the water and sewage systems operating. Almost every worker we speak with uses a mobile phone as part of their tasks to keep these services running.

The weather is usually beautiful during the summer months. During this special time of the year, summer community activities include fishing derbies, bible camps, and even the ClearWater Music Festival in Deer Lake First Nation. All these Indigenous communities are located on rivers or lakes and fishing is an everyday activity for many community residents; meals of fried fish are often community events. The children swim wherever and whenever they can. Our conversations and interviews with community members are often interrupted by messages and postings arriving on smartphones. Everywhere, mobile phones are in evidence and used by community residents to share news and information about activities, plans and community events with friends, family members, and contacts in their own communities and other Indigenous communities and towns and cities far away.

Community residents with smartphones are using them to access the Internet via the many WiFi networks throughout the communities. Facebook is a primary means of communication. Each community has a Facebook page closed to community members and a few outside friends and an active “buy and sell” or auction site that supports the local social economy. Most evenings, several members in each community will use the site to advertise dinner plates for sale. For example, in Poplar Hill First Nation, moose stew and bannock plates were offered at \$15 a plate with 10 plates gone in less than half an hour after the picture of the plates were posted.

The story of KMobile is a successful narrative for these remote Indigenous communities, but many challenges remain. The intent was always to have KMobile support data exchange in addition to voice and text, but to date this goal has proven a significant challenge. The upgrade to 3G – LTE hardware and software in 2012 proved to be a costly experience when the equipment purchased and installed did not work as required despite the due diligence performed beforehand. As a result, alternative solutions are now being researched along with a new business strategy, and the upgrade to LTE is still being planned. The community feedback generated by the research provides additional information for both KO-KNET and the appropriate funding bodies who are required to support these capital investments. Until recently, half of the 20 communities with KMobile sites were served by microwave broadband transport and half by a community-owned C-band satellite link. Many are now linked to the new fibre network that itself was a major fundraising feat for the communities.

Before KMobile existed, the dominant telecommunications companies never considered having a mobile phone service in this region due to their urban-centric business model and network design. Now, mobile technology has become an essential service in these remote Indigenous communities. Additional public investments are now required by the community-owned mobile service to upgrade their network to LTE as well as reach the remaining unserved communities. KMobile is a successful example of public funding flowing directly to an Indigenous organization and Indigenous communities to build and operate telecommunications infrastructure. However there remains much work to do to change government policies created by urban-based bureaucrats so that they recognize the essential aspect of mobile services in these remote communities and to support community-owned solutions rather than funding solutions from urban-based corporations.

After six years of operating KMobile, the local mobile business case in these remote communities has been demonstrated successfully; the Indigenous business model is all about the

public good. Lives have been saved with this tool, people now feel safer travelling on the land and waterways, and new economic and social opportunities exist. The operational business models for infrastructure systems such as KMobile involves a complex combination of people, resources, partnerships, and support services. The Indigenous communities are investing in the ongoing operation of KMobile with technical staff and resources. These strategic investments in mobile technology are making it possible for everyone to choose where they want to live and raise their families. However, much more work is required to deliver equitable and affordable mobile services in these remote communities.

The five remote Keewaytinook Okimakanak communities we are visiting this summer are resilient. They are experiencing the same challenges as other northern Indigenous communities described in the United Nations report earlier in this chapter – high rates of poverty, unemployment, chronic diseases, overcrowded housing and many other problems typical of remote Indigenous communities in a settler colonial society and economic system based on resource extraction. Surrounding these Indigenous communities are their traditional territories, rich in natural resources. These resources are being extracted for economic gain and to support the comfortable lifestyles of Canadians living in southern cities while the Indigenous communities receive only enough public funding for basic survival. However, in the long history of Indigenous presence in this region, settler colonialism is a recent phenomenon. Indigenous people and communities have always existed across this vast region and will continue to be here for countless generations to come. They are demonstrating their ability, willingness and desire and are quickly developing the capacity and experience to own and operate the infrastructure required to support their lives and livelihoods on their traditional lands.

ACKNOWLEDGEMENTS

We want to acknowledge and thank our research partner Keewaytinook Okimakanak (KO) and the Nishnawbe Aski who are living in the remote KO First Nations for supporting us in our work. The lead author also acknowledges the traditional, unceded lands and people of the Maliseet Nation where he lives and attends the University of New Brunswick. Thank you to all of the participants and survey respondents who gave their time, ideas and efforts to help move this research forward. In particular we would like to thank Franz Seibel at the Keewaytinook Okimakanak Research Institute and the people who completed the community surveys in 2011 and 2014. The research was conducted as part of the lead author's thesis program in Critical Studies at the Faculty of Education, University of New Brunswick and as part of the First Nations Innovation (FNI) research project - <http://fni.firstnation.ca>. Project partners include Keewaytinook Okimakanak in Ontario, the First Nations Education Council in Quebec, Atlantic Canada's First Nations Help Desk / Mi'kmaw Kinamatnewey in Nova Scotia, and the University of New Brunswick. The FNI research has been funded since 2006 by the Social Sciences and Humanities Research Council of Canada (SSHRC) with in-kind contributions from the project partners. The lead author's research is also supported by SSHRC.

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