

Reference: Whiteduck, G., Tenasco, A., O'Donnell, S., Whiteduck, T. & Lockhart, E. (2012) Broadband-Enabled Community Services in Kitigan Zibi Anishinabeg First Nation: Developing an e-Community Approach. Paper for the 2012 International Rural Network Forum, Whyalla and Upper Spencer Gulf, Australia, 24-28 September.

Broadband-Enabled Community Services in Kitigan Zibi Anishinabeg First Nation: Developing an e-Community Approach

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1 Introduction

First Nations in Canada are autonomous communities with elected governments. They have a responsibility to deliver services - including health, education, policing and security and many others - to their community members. The Canadian government has a fiduciary responsibility for First Nations that obliges it to provide the funding necessary for First Nation governments to deliver these services to their members. Historically and currently however the level of government funding for First Nations is lower than the government funding for non-Native communities. The result is that First Nation governments are in a constant struggle to secure the funds required to deliver appropriate services.

This situation reflects the historical and ongoing power struggle between First Nations and the Canadian federal government. More than 600 First Nation (Indigenous) communities are located across Canada's vast land mass. Many are in rural areas far from urban centres and remote places accessible only by air. The Canadian Constitution recognizes First Nations peoples as one of the founding nations of Canada. The Constitution also recognizes First Nations' right to self-determination, to negotiate the terms of their relationships with Canada, to establish the governance structures they consider appropriate for their needs, and to determine how they wish to develop their communities.

However the Canadian government has not lived up to the requirements outlined in its own constitution. More than a decade ago, the Canadian government's most extensive research inquiry into the situation identified many First Nation community development priorities that remain current today. The Royal Commission on Aboriginal Peoples (1996) found that the historical treaties with First Nations were replaced with policies intending to remove First Nations people from their homelands, suppress First Nations and their governments, undermine their cultures, and stifle their identity.

The Commission also found that First Nations people are seeking a range of remedies for these injustices; most of all they want control of their lives (RCAP, 1996). The most comprehensive historical research into this situation has documented how First Nations people have struggled for this control over their lives, from organized resistance in the 19th century, to the development of political organization in the 20th century, to the current times. First Nations have been using whatever means have been available to rebuild and revitalize their communities (Miller, 2000).

Engaging in this ongoing struggle takes considerable time and energy for First Nations governments - time and energy that could otherwise be spent developing and delivering services and activities to community members. First Nation governments are in a constant cycle of having to find and fight for funding to effectively deliver essential services and activities. Lack of funding for IT development is always a challenge. There is never enough funding to provide an adequate level of IT infrastructure, applications, training, and ongoing support and maintenance, despite the fact that governments benefit from IT development and require online delivery of reports.

Kitigan Zibi Anishinabeg First Nation

Kitigan Zibi Anishinabeg First Nation is the largest Algonquin community in Canada. Kitigan Zibi is unceded territory situated in a rural region of Quebec two hours by road north of Ottawa. The community's published story - *Since Time Immemorial* - describes the history of the community, including the Anishinabe ancestors, the first contact with Europeans and the impact of the colonial regimes (Kitigan Zibi Education Council, 2004). Today Kitigan Zibi is recognized as a leader for their community services. Kitigan Zibi has since 1980 successfully supported community members to take ownership of service development and delivery.

Among the community's many services and programs are: an elementary and secondary school, a day-care, a cultural centre, a community hall, a community radio station, a health centre, a police department, a youth centre and others. Their community services are led and staffed by fully-trained and qualified community members.

As computers, broadband communication networks, and Internet and cellular services have become available in Kitigan Zibi, the service sectors have been integrating these technologies with a goal of improving services for and communications with community members. At the same time, and similar to First Nations everywhere across the country, Kitigan Zibi faces challenges in their efforts to remain innovative and plan for future delivery of services using technologies.

The Kitigan Zibi community owns the local broadband infrastructure that supports its development and enhancement of local services. In this present study, we argue that local ownership, control, and management of the local broadband communication infrastructure is critical to support First Nations in their delivery and use of community services now and into the future.

For our collaborative study, we conducted a qualitative analysis of interviews with community services staff in Kitigan Zibi Anishinabeg. The interviews explored questions of technology and community, including their current successes, challenges, and future potential. Kitigan Zibi is developing a strategy to integrate communication infrastructure and information, and communication technologies (ICT) into services that promote community, economic, social, cultural, and intellectual development. The discussion focuses on how the community can integrate a holistic "e-Community" approach into its strategy.

2 First Nations autonomy, community resilience and communication infrastructure

As mentioned earlier, the Royal Commission on Aboriginal Peoples (RCAP) was the most comprehensive investigation in Canada into the situation of First Nations. In its 1996 report, RCAP described how Canadians know little about the peaceful and co-operative relationship that grew among the First Nations and the first European visitors in the early years of contact - including the alliances and the friendship treaties outlining promises that were never kept by Canada (RCAP, 1996).

The history of indigenous peoples in Canada shares many similarities with indigenous peoples globally who continue to struggle against the exploitation of their lands and resources by external forces. In 2010, the Canadian government adopted the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). The UN declaration, similarly to the Canadian Constitution, affirms the right of Indigenous peoples to self-determination. Among the many rights affirmed in the UN Declaration is the right of First Nations to autonomy in matters relating to their internal and local affairs and the right to maintain and strengthen their distinct political, legal, economic, social, and cultural institutions (United Nations, 1997).

In Canada, First Nations have experienced various destructive policies lasting for more than a century, such as the residential schools and the ongoing *Indian Act*, that defy all the

requirements of the UNDRIP. A function of these state policies was to deprive First Nations of the tools of resiliency (their beliefs, traditions and institutions) in order to assimilate them into the colonial culture. Reclaiming their beliefs, traditions and institutions can help First Nations communities to resist colonial aggression and reconstruct their identities (RCAP, 1996; Tousignant & Sioui, 2009).

Researchers have found that self-determination, community autonomy and the control over the delivery of services - such as education, health and policing - contribute to cultural continuity and community resilience (Chandler & Lalonde, 2003). Culturally-appropriate services support students, community members, families and community institutions facing adversity (Tousignant & Sioui, 2009).

In the most comprehensive analysis to date of the research on community resilience, Kirmayer and colleagues found that:

“Unlike a disaster that disrupts or destroys existing infrastructure, many Aboriginal communities have undergone radical changes, displacements and reconfigurations in response to colonization and have had to improvise ways to cope with continuing marginalization and external control. As a result, rather than focusing on crisis responses to catastrophes, Aboriginal resilience must be considered in terms of the impact of structural violence, and interventions must take a long-term approach to rebuild, repair and revitalize community strengths and institutions.” (Kirmayer, Sehdev, Whitley, Dandeneau & Isaac, 2009: 63)

Kirmayer and colleagues have identified the built environment as a core dimension of community resilience. They believe that community resilience can be measured in part by its stock of built capital in the form of infrastructure (Kirmayer et al., 2009). Built infrastructure, in their model, includes housing, water, power, and communications. For this present study, we understand communications to encompass all elements of telecommunications, including broadband infrastructure, networks, and applications.

3 Broadband, e-Community, and First Mile in Remote and Rural First Nations

In Canada, no coherent federal government policy exists for broadband networks and communication infrastructure in rural and remote regions of the country (McMahon, O'Donnell, Smith, Woodman Simmonds & Walmark, 2010). After years of political consultation, the federal Digital Economy Strategy is still only a discussion paper and strangely absent from major national policy plans. At the same time, in the Canadian policy landscape, the federal government is responsible for policy related to its relationship with First Nations.

The First Nations Chiefs, through their national political representative body, the Assembly of First Nations (AFN), have passed numerous national resolutions relating to broadband infrastructure. The most recent was at the AFN Chiefs meeting in December 2011. In 2010, the AFN published its e-Community ICT model (Whiteduck, 2010). In this national model, communication infrastructure is part of a broader plan for economic, social, and cultural

change based on knowledge and information. The e-Community ICT model is aspirational, in that it suggests how First Nations should approach developing a strategic plan for its broadband infrastructure and ICT development. However there are no new funds available that First Nations can use to develop their e-Community strategy.

The AFN's e-Community ICT model builds upon a common network model employed by Canadian governments, institutions, companies and corporations. It has five themes: First Nations capacity development, First Nations connectivity, human resources development, information management, and service delivery and partners (Whiteduck, 2010). The AFN is also proposing that First Nations communities and organizations oversee the public funding required to develop and control the communication infrastructure in their communities.

In its latest national resolution, the AFN noted that the e-Community ICT model is very compatible with a First Mile approach (McMahon, O'Donnell, Smith, Woodman Simmonds & Walmark, 2010). The First Mile describes the need for First Nations to own, control and manage their local broadband infrastructure and the services and data flowing through their local networks. First Mile concepts support the principles of OCAP (Schnarch, 2004) applied to broadband - ownership, control, access and possession. These concepts also include support for First Nations to use broadband and ICT for community-controlled service delivery in a holistic manner. Policies to support a First Mile approach include supporting community members to use these technologies effectively and ensuring they have the capacity to do so (McMahon et al., 2010). Examples of First Mile in action are documented in Fort Severn's Technology Showcase (2011), the First Mile website - <http://firstmile.ca> - and a recent study of Fort Severn's technology development (O'Donnell, Kakekaspan, Beaton, Walmark & Gibson, 2011).

The current study considers these larger historical, political, economic, cultural, and social elements from the literature. These elements help explain the development of the broadband communication infrastructure in Kitigan Zibi Anishinabeg First Nation and how the community is using it to deliver local services and engage with community members. The paper highlights some of the community's challenges and discusses some ways forward. In the discussion, we consider the AFN's e-Community model in more detail and explore ways that Kitigan Zibi can apply it when developing their own local broadband strategy. (Whiteduck, 2010).

4 Study Methodology

This study is part of a larger research project in the Quebec, Ontario and the Atlantic regions (<http://videocom.firstnation.ca>). The current study is a collaboration with Kitigan Zibi First Nation, in partnership with the First Nation Education Council (FNEC) in Quebec, and the study authors include staff from the three collaborators. Kitigan Zibi worked with the visiting researchers to define and carry out the study in the community. Community members were welcoming and informative. Research partner FNEC provided logistical support, ideas and technical expertise.

Researchers from the University of New Brunswick visited Kitigan Zibi in June and August 2011 and completed 14 interviews with community service providers. The interview transcripts were coded and a basic thematic analysis was conducted. Community co-authors and partners contributed additional information and perspectives. This approach created a clearer picture of the development of community services in Kitigan Zibi, as well as, how the community is using its communication infrastructure for service delivery.

Based on these findings, a further analysis considered the e-Community model and some of the opportunities and challenges for the future. The research protocols follow the ethical guidelines for doing research with First Nations communities outlined in the federal Tri-Council Policy Statement on research ethics (CIHR, 2010).

5 Research Findings: Community Services and Communication Infrastructure

Kitigan Zibi's local broadband communication infrastructure is a cross-sector enabler and provides the necessary foundation for many local community services and processes. The Kitigan Zibi community has integrated many broadband applications into its community service delivery and communication, and most recently the community is working to develop its strategic plan for the local fibre infrastructure that it owns. Kitigan Zibi First Nation is a vibrant community that will need to insure its communication infrastructure meets the community's growing needs. A strategic plan could identify areas of growth and development to take advantage of future technology innovation.

Below we describe the community's use of information and communication technologies (ICT) to deliver services in three core service areas - education and culture, health, and policing and security. In addition to these three areas, Kitigan Zibi provides many services and activities using ICT that are not discussed in this paper, including administration in which ICT is very heavily used.

Similar to other First Nations across the country, the Kitigan Zibi First Nation community faces constant ongoing funding challenges to maintain and develop its infrastructure and service areas using ICT. Staff described as a year-to-year struggle, not knowing what level of funding will be available for ICT development and spending. Government policies related to ICT in First Nations are undeveloped or non-existent and so it is very difficult to obtain the funding required to provide appropriate IT services in the community.

Leading up to the latest developments is the community's ongoing focus since 1980 to support community members in their post-secondary education and training. Many community members leave to pursue further education - primarily in Ottawa - and then return to contribute their skills to the growth of Kitigan Zibi. In many cases they are qualified to be community service sector staff members. They work in all the sectors including education, health, policing, security, and many others. Almost all the Kitigan Zibi community sector staff are lifelong members of the community. Kitigan Zibi has obviously been successful at training, hiring, and retaining community members for these highly-skilled roles. It is these community members who are integrating broadband networks and applications into the community service delivery.

ICT in Education and Cultural Services

Kitigan Zibi's education sector administers 21 programs delivered through the primary and secondary schools, junior and senior kindergarten, special education service, and cultural centre.

The community emphasizes the importance of educating young people so they gain the necessary skills to pursue post-secondary education and further their goals, including entering the labour force. Assistance includes support for community members through their post-secondary program for students in universities and colleges in Canada and the United States. One service provider explained: *"We offer tuition, living allowances, books and travel funding if they meet the criteria of our post-secondary policy. So we support about 145 students in that program"* (Community Member).

The various components of the education sector use ICT in numerous ways to deliver services. Kitigan Zibi Kikinamadinan (high school and elementary) takes an innovative approach to teaching and learning by integrating ICT into the classroom (Lockhart, Tenasco, Whiteduck, & O'Donnell, 2012). Educators use email on a daily basis. In the classrooms they and the students use SMART boards, e-Learning programs, various multimedia programs, videos, laptops and iPads. In addition, ICT is also used in after-school programs, summer programs, and projects such as the Indigenous Culture and Media Innovations (ICMI) program.

Wazon, the community daycare and afterschool program is dedicated to offering exceptional service to Kitigan Zibi and other First Nation families. The staff uses ICT to communicate with parents and the community through email, telephone, and the community online newsletter. The interviews identified an ongoing need for training and support of the education sector staff to stay up-to-date with technology developments.

The community's cultural centre displays Kitigan Zibi culture and heritage within it while also serving as a venue for community activities and gatherings. ICT is deployed in a variety of ways by staff and the community at large within this centre. Staff communicate with one another and other sectors via email, use the community online newsletter and Facebook to advertise events, and create detailed exhibits with the help of web searches and heritage videos. The centre is also one of many locations in the community with a videoconferencing unit available for meetings and events - this facility allows community members to participate in gatherings outside their rural environment and to connect with people in distant locations for live audio-visual exchange of information.

ICT in Health Services

Kitigan Zibi administers their own health services through various programs. These include environmental health and social services; community health nursing; home and community care programs; mental health counseling; substance abuse addictions counseling; medical transportation; and a medical clinic. All of these services and activities have extensive use of ICT, notably for online reporting functions for which the technology is essential to daily operations.

Kitigan Zibi's health centre is well-established and, being a rural community, brings doctors in three times weekly to consult with community members and support health and wellness. The health centre includes staff trained in assisting the older population with activities of daily living (ADLs), three addictions counselors available to help community members, as well as two youth workers trained in youth protection.

All the health sector staff, apart from the doctors who visit the community, are members of Kitigan Zibi Anishinabeg First Nation. One issue faced by Kitigan Zibi and all other small communities is that because of the interconnectedness of Kitigan Zibi, there can be challenges to working in sensitive areas such as palliative care and child protection. While considering these challenges, the community sees great value in their own members administering their services and so it supports community members to achieve the required qualifications.

For specialized health services that the community does not offer, such as dental services, they have medical transportation. This is a program supported by Health Canada and delivered by the community that transports community members into health facilities in Gatineau and Ottawa for appointments with specialist health professionals.

In the workplace, health service providers are using mobile phones, computers, email, videoconferencing, and other technologies to facilitate their everyday work. Service providers noted that texting has improved the way co-workers can communicate with one another, making it more efficient.

The community nurses and medical transportation drivers communicate with one another and the main centre via mobile phones provided by the community. This is important for the health sector because it increases communication and availability while also ensuring that these service providers are accessible at all times if they need to be reached immediately. Given the limited cell service in some parts of the community, however, being out of range can create challenges for health service delivery using mobile technologies.

Technology is most often utilized for reporting purposes since the health sector has different levels of government they are required to report to including Health Canada and the department of Aboriginal Affairs and Northern Development Canada; the Internet is necessary to carry out these reporting duties. Health sector staff also use the Internet for communicating with referral services for clients.

Videoconferencing allows health centre staff members to communicate and participate in meetings with different levels of government as well as other health services in other Algonquin communities. The videoconferencing units in the health centre are also available to community members who reserve them for meetings. There are challenges with using videoconferencing, which include, but are not limited to, connection problems. One health service staff member explained: *"We rely on our techs to help us explain what's going on with our connections and we're getting different explanations as to why problems are*

happening and, honestly, we don't know. We don't know who is right, what is going on” (Service Provider).

The service providers working in the health sector understand that they must continue to evolve their technology and how they use it to reach the younger generations in an efficient way. The community website is one place that they can post updates and news regarding their services and there are other online forums as well, such as Facebook. One service provider explained the different techniques required for the dissemination of information to the community: “... when we're doing our programming, we have to keep that in mind that they [the older generation] like gathering and talking to each other and sharing information that way, whereas if you're trying to communicate with the younger generation then you have to do the Facebook thing or you have to do the social networking or the internet thing, you know” (Service Provider).

ICT in Policing and Security Services

The eight officers that make up the Kitigan Zibi Police force are all long time members of the community. ICT is integrated into their everyday operations since they use it to communicate with one another, other police forces, the community, and the world at large.

Due to their position, it is important for officers to be available at all times. Advances in mobile technologies have done much to increase ability to respond to the community. Officers always have their cell phones with them, ready to react quickly to calls. Texting, for its convenience and better security, has taken the place of voice calls. Officers communicate quickly with one another via text messaging.

Social networking sites such as Facebook have also had an impact on the services that the Kitigan Zibi Police force delivers. Given the size of the community, everyone knows everyone else and accessing information about people is less difficult, now that people post so many things about themselves online. Referring to Facebook, one officer mentioned: “We use it in the investigations. Certain issues we have to deal with here in the office like, for instance, we do a lot of drug work so we access information on people through Facebook. If we have targets, well, we know what they're doing, who their friends are, etc...It's a real good investigative aid. That's part and parcel of what the positive things for us here at the police station” (Police Officer).

The police force also makes use of Internet databases specifically designed for police departments in Canada. They are able to access information about individuals and share this information with other departments across the country.

The challenges faced by the policing sector involve connectivity and adaptation. One officer mentioned that constantly having access to a signal on their phone was important but was not always possible depending on the location that they were in. Kitigan Zibi covers a large geographical area in this rural region, and within the community boundaries some homes and roads are relatively isolated and, as a consequence, outside of cell phone range. Another challenge experienced by officers is keeping up with the quickly evolving technologies. Using

these technologies has obviously been a benefit as it has increased the department's efficiency in responding to situations and pursuing investigations. The challenge for community officers in the future will include how to stay on top of the constantly evolving advancements of communication tools.

6 Discussion: An e-Community Approach and Strategic Future Service Development

The study findings describe how Kitigan Zibi Anishinabeg First Nation employs ICT and its broadband communication infrastructure to deliver several essential community services: education and culture, health, and policing and security.

The following discussion considers these findings in light of the e-Community model developed and supported by the Assembly of First Nations (Whiteduck, 2010). The guiding question is: How can Kitigan Zibi integrate the e-Community approach in the strategic plan for sustainable local broadband communication infrastructure?

Capacity development

As described earlier, the AFN's e-Community ICT model builds upon a common network model employed by Canadian governments, institutions, companies, and corporations (Whiteduck, 2010). Following the common network model, First Nations require capacity resources for new and existing infrastructure development, institutional development, and operations and management that are stable and predictable.

This includes capital funds to build administrative infrastructure and support ongoing operations and maintenance of the networks. The funding formula needs to be holistic and coordinated among all the community's program areas. The traditional services silo approach to broadband development is not sustainable. Broadband communication infrastructure is, and needs to be seen and supported as, the cross-sector enabler for all program and service delivery.

The community can review the funding arrangements for the various sector silos to identify resources for sustainable communication infrastructure development. One option would be to create broadband communication infrastructure as a new service area, staffed in a manner similar to other core service areas and with a vision for innovation, operational excellence, and user satisfaction. Another option would be for the different service sectors to pool together their funding for ICT development and support and work toward a more integrated approach. When deciding on the various models to choose from, there are conflicting opinions on the best ways forward and it can be challenging for the community to decide which options to pursue.

It is important to underline that the e-Community approach is only a high-level model and that so far First Nations including Kitigan Zibi have not had any access to funding that would support their development of these coordinated, integrated and strategic approaches to ICT use.

Connectivity

The study findings clearly demonstrate that communications infrastructure and ICT are heavily integrated into community service delivery in Kitigan Zibi First Nation. According to the e-Community model, future levels of service will depend on the community's ability to manage and transfer information and will need to be based on adaptable, scalable, sustainable, and affordable digital communication systems.

The community is still developing its connectivity and many challenges remain in the goal of ensuring that all community homes have an adequate internet connection and the ability to use it effectively. One challenge is ensuring that all homes can access the Internet - currently some homes are outside of the wireless range. While a turbo-stick can be used, these are expensive. Some families must make a choice between getting an internet connection and paying for other household expenses.

Clearly there are also differences among community members in their level of ability to use ICT effectively - the most obvious being the age gap, with the community youth being much more active users of technology than older community members.

The e-Connectivity model includes maintaining a bandwidth guarantee by ensuring First Nations ownership and control of its local infrastructure, including the ownership of network circuits. With bandwidth guarantees, Kitigan Zibi will be able to control the flow of data and information on its local networks. It will also be able to determine how the available resources are managed and used by the different service areas, in the same way that hospitals, universities, and other public institutions manage their own bandwidths. For example, the community would manage the network so that an e-health application, such as a doctor consult, will be supported over the need to download a music file.

In particular, the study clearly found a need for improved cellular and mobile connectivity. Both health and policing services require reliable mobile services with good connectivity throughout the territory. Anything less will mean inequitable services that disadvantage community members living in the most rural areas of the territory.

Following the e-Community model would mean that Kitigan Zibi will have managed broadband circuits that enable the community to administer its own data, applications, and services. It would have the capacity to assess and select IT solutions that are scalable, available, sustainable, and have the capacity required. For example, the model will allow the community to develop local cellular services in areas of the territory currently underserved.

ICT Human Resources Development

The e-Community model recognizes that community IT specialists and information management training are required to support the local and regional systems. A coordinated development strategy for local ICT capacity building will support First Nations and their regional organizations with the resources for local education and application development.

The research clearly identified an ongoing need for training community services staff in all three sectors included in the study. Alongside with the training would be processes to emphasize more streamlined ways of explaining ICT issues to help staff, particularly health centre staff, deal with technical issues.

Ongoing training is a cross-sectoral need. One Kitigan Zibi service manager interviewed for this study explained: *“There’s a lot of technology out there... learning how to use it properly, I think, is a challenge and having time to get your personnel to get the training that’s required. I think that’s the challenge. Often, there are so many things happening in a day you can rarely set off enough time on the side to really get caught up on some of this stuff. But training is crucial; ongoing training is crucial to keep up with changing technology”* (Service Provider).

All staffing levels and roles will need to be included in the plan. The technologies are used extensively in different ways. The training needs and skills contributions of administrative staff are complementary to those of program managers and all service delivery staff. Training plans will need to be tailored to the different staff needs. Training and awareness could focus on developing a culture of community technology innovation in all service areas and programs.

At the same time, connectivity and extensive use of ICT can be both a friend and an enemy, especially considering the need to maintain a healthy work-life balance. ICT allows more immediate contact with people, increasing the time pressures that staff experience. Staff members need to find that necessary balance so that their work life does not make them disconnected from their lives at home.

Information Management

Additional investments are also required for local information management systems, document management, and e-reporting that ensure the principles of OCAP - ownership, control, access, and possession - (Schnarch, 2004) are protected.

The e-Community model includes the capacity to manage data and information. This includes knowing how to develop locally and regionally managed ICT systems to create, build, expand and maintain these communications infrastructure supporting community service delivery. An appropriate approach is support for First Nation information planning, accountability, and tool design (Whiteduck, 2010).

A holistic approach suggests that Kitigan Zibi’s local broadband infrastructure strategy will include analysis of current and future local and regional economic data, training requirements and delivery milestones, local security and emergency information requirements, and the systems to support delivery and management of information in various service areas - education, health and so on - and appropriate data storage and controls. All these are from the e-Community model (Whiteduck, 2010).

Service delivery and partners

Many First Nations have developed solid and innovative partnering arrangements with the private sector and government to develop local and regional e-community opportunities. The e-Community strategy supports local innovation through these partnerships. Innovation is happening and needs to be supported in many areas, such as support for First Nations to negotiate arrangements that leverage national economies of scale, such as large educational software purchases for First Nations schools (Whiteduck, 2010).

The e-Community strategy also calls for national research partnerships. The research can ensure that local and regional First Nation authorities receive the recognition needed to establish these relationships with the appropriate partners (Whiteduck, 2010). The Kitigan Zibi community is a partner on several large research projects related to technologies and other topics of interest to the community.

7 Conclusions

Our objective for the contribution of this study has been to explain how the broadband communication infrastructure in Kitigan Zibi Anisinabeg First Nation supports the development, delivery and enhancement of local services and how the services and infrastructure can be sustained through a strategic plan that considers the e-Community model. The analysis includes the importance of maintaining a focus on the community ownership of its local infrastructure and why ownership and control is critical to the support of services at the community level.

The study clearly shows that the funding available for ICT development, training, support and ongoing maintenance is inadequate, and that Kitigan Zibi managers and staff are engaged in an ongoing struggle to obtain the required funding for ICT and for service delivery in general. This is experienced in all the different sectors. In health for example, the funding available per capita in Kitigan Zibi First Nation is lower than that provided to the health centre (CLSC) in a neighbouring town.

As for contributions to federal policy, we suggest that the current lack of a federal plan for supporting infrastructure development in rural and remote communities means that accessing stable funding sources will be a challenge for Kitigan Zibi. To ensure sustainability, growth and further innovation in its delivery of community services, Kitigan Zibi will need ongoing revenue to develop and maintain its broadband communications infrastructure.

Following on from the research by Kirmayer and colleagues (2009), broadband communication infrastructure and ICT applications can be considered measures of community resilience. Infrastructure is a cross-sector enabler supporting all areas of community communications and service delivery.

Our findings in this study also support the perspective that community autonomy and the control over the delivery of services - in this case education, health and policing - can be supported by the community's use of these broadband networks and tools. The culturally-

appropriate services delivered using broadband communications are supporting community members, families and community institutions.

With the right support and strategic approaches, Kitigan Zibi Anishinabeg will no doubt to continue to expand as a leader in the digital economy and society and serve as an example of a small autonomous community using its broadband communication infrastructure strategically in culturally-appropriate ways. By focusing on the needs of their community members and taking a holistic strategic approach to broadband, Kitigan Zibi is asserting its community-oriented values. This strategy stands in sharp contrast to the corporate and private models promoted and supported by public funding and institutions. First Nations such as Kitigan Zibi are models of innovative communities, making the best strategic use of scarce resources to build robust and sustainable infrastructure and applications that meet the needs of the community members.

In international circles, First Nations in Canada are increasingly seen as leaders in broadband development and appropriate ICT use. There are many ways these leadership activities can be encouraged and sustained. First Nations can provide examples for rural and remote communities everywhere for developing sustainable local broadband infrastructure and services.

One community member interviewed for this study pointed out that these technologies are an important component of the future development of Kitigan Zibi because the community:

...would like to remain sort of cutting edge of what's happening out there. We don't want to be 5 or 10 years behind in terms of what's out there. We want our students to leave our system fully aware of as much technology as possible when they go on to vocational programs or postsecondary programs. It's part of giving them the tools they need to be successful if and when they choose to leave Kitigan Zibi. (Kitigan Zibi Community Member).

To emphasize the general feeling that community members that took part in this research have about the importance of technology for community advancement, we can draw upon an inspiring message from a community member:

...I could probably only speak to the rather strong sense that I have of ... It's woven its way into the fabric of the community, and it's considered ... I'm going to use the word essential. It's really .. no longer a question of just a tool, it's a question of lifestyle, both in the home and academically... I'm going to say that broadband is a right, it's not a privilege. And it's essential. (Kitigan Zibi Community Member).

This and other quotes from community members reveal that Kitigan Zibi First Nation is passionate about ensuring that community members have all the technology required to take advantage of opportunities to improve their lives. There are many innovative ways that the community would like to use technology in the future, such as for Native language development as well as further economic development and more online businesses. The work continues to make these developments possible.

Acknowledgements

The researchers extend a special note of appreciation to Kitigan Zibi First Nation for welcoming us into their community, showing us some of their achievements, and allowing us to conduct this research in collaboration with them. Thank you to Chief Gilbert Whiteduck and members of the community leadership for accepting our project and working with us to complete it. A special thanks to our community liaison, Anita Tenasco and our VideoCom research partner Tim Whiteduck for coordinating our visits and offering continuing support throughout the entire project. We would also like to thank all the Kitigan Zibi community members and residents who participated in this study and shared their experiences with us. Those who consented to be named are: Jean-Guy Whiteduck, Keith Whiteduck, Judy Cote, Warren McGregor, Cheryl Tenasco-Whiteduck, and Anita Tenasco. The Kitigan Zibi study was conducted as part of the VideoCom project (<http://videocom.firstnation.ca>). The VideoCom partners - the First Nations Education Council, Atlantic Canada's First Nation Help Desk, Keewaytinook Okimakanak, and the University of New Brunswick - contribute in-kind resources to the project. The Social Sciences and Humanities Research Council has supported VideoCom with three research and outreach grants since 2006.

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