

Land and Language: Exploring the Uses of
The Ktunaxa Nation Network in British
Columbia, Canada

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Abstract

This thesis research examined the implementation of the Ktunaxa Nation network and explored its ongoing use and development. The Ktunaxa Nation is comprised of four Aboriginal communities in south-eastern British Columbia, Canada. The Nation established internet infrastructure throughout the communities primarily to enable the dissemination of the Ktunaxa language of which there are only 24 speakers remaining. The purpose of this research was to examine the various uses of the Ktunaxa internet network related to land and language, at both a community and organizational level. The objectives of the research were 1) to describe the access to connectivity and ICTs in the Ktunaxa Nation communities; 2) to explore the ongoing use and development of the Nation network, with a focus on uses related to land and language; and 3) to investigate network uses at the organizational level, specifically use by local businesses and by the Nation.

The review of literature indicated that grouping the various uses of internet networks into categories would inform the analysis. The following categories were utilized: use related to land; use related to language; economic use; educational use; use related to health; and social use. The semi-structured interview guides utilized these categories and in total sixty-five interviews were conducted in the spring of 2009. Four types of interviews were conducted and both snowball and purposive sampling were utilized. Data analysis included an Nvivo-based content analysis of selected interviews and use of the restorying method to create the network narrative. Predetermined categories provided the framework for the Nvivo-based content analysis. The restorying method was

employed to enable a number of individual experiences to be refashioned into one comprehensive set of events that took place during the implementation of internet infrastructure, drawing upon interviews with a selection of participants. This enabled a marginalized story that had been repressed to be represented here as an anecdotal, yet comprehensive account of the experiences of study respondents.

The Nation network was described by study participants as being “Built to Fail”. The network narrative describes the challenges and difficulties associated with network implementation. Telling the story of the Nation network was important because the ability of local community members to access and use the Nation network was negatively impacted in that access was delayed and in some cases not provided. However, access to connectivity was provided in all band administration offices as well as in the community learning centers. Two of four communities had received residential connectivity at the time of data collection. Connectivity was subsequently provided in all four communities.

In this thesis, emphasis was given to uses related to land and language. The most commonly reported use of the network related to land was the traditional land use and occupancy studies conducted at St. Mary’s Band which defined traditional and current hunting, trapping and berry picking sites as well as areas with spiritual significance. Using GIS mapping to mark these areas enables the Nation to continue with future plans for housing and business as well as also creating a cultural record, digitally archived for current use and use by future generations. Further, using the internet and email in the management of land is a common practice in urban centers, and is rapidly becoming a necessity for resource managers in rural, remote areas. Access to the internet and email in

rural areas and Aboriginal communities enables equitable participation and may level the playing field between governments and/or large resource developers and small rural communities. The most commonly reported uses of the network related to language were the Ktunaxa 101 and 102 online courses and First Voices. First Voices is an online resource to be able to hear the Ktunaxa language spoken by elders. Ktunaxa is a language isolate, meaning that it is one of a kind and unrelated to any other language in the world.

This research also found other commonly reported uses related to economic use, educational use, use related to health and social use. Economic uses included online banking and the creation of websites by local businesses. Educational uses included online courses via a variety of institutions and online research for school assignments. Uses related to health included accessing health information online and the use of videoconferencing technologies by health unit employees. Lastly, social uses included live chat and facebook.

Based on the results found in this thesis through the network narrative and survey of use there were three main conclusions. 1) The Nation network is available to businesses and residents in 31 unincorporated communities in the area, positioning the Nation to become a leader in internet service provision in the East Kootenay's. 2) The Ktunaxa Nation members have embraced connectivity and ICTs to meet their goals and to enhance the quality of life for community members. For example, Nation members utilize the internet for land management and language preservation. Within the area of land management, internet access has become an essential tool for land managers; without this access, smaller rural communities find themselves at a disadvantage on many levels.

Language preservation and dissemination are goals of the Nation addressed via broadband connectivity. The Ktunaxa people have taken the initiative to combine the existing knowledge passed down from elders with modern technology to ensure that the Ktunaxa language survives. The Nation network has enabled the process of language preservation to continue for the benefit of both current and future generations. 3) Communication among the four communities and between the communities and government or large organizations has been enhanced through the use of a system called Groupwise that utilizes VoIP.

There were a number of recommendations that emerged from this thesis research for the Ktunaxa Nation and the Government of Canada. Primary recommendations made to the Ktunaxa Nation include: 1) Initiatives related to the preservation and dissemination of language should continue to be supported and further developed; 2) Continued support should be provided to the community learning center's including core funding for the training and employment of local individuals in the community learning centers; and 3) Initial contact or engagement of community members in Nation-managed projects may benefit by utilizing social networking and providing project details online. Primary recommendations to the Government of Canada include: 1) Funding should be extended for community broadband initiatives 2) Project guidelines established at the federal level should include clear definitions of contractually required roles and responsibilities of the different parties involved in multi-stakeholder projects, specifically, communities, municipalities, NGO's and private enterprise.

Future research may include an assessment of impacts that describe the changes within a community or communities after the introduction of internet infrastructure and related tools. Although baseline data is rarely available, once a community's use of ICT has been recorded, a snapshot of use at that point in time is created from which future comparisons can be made. The Ktunaxa experience may serve as both a model of best practices related to network initiatives and also as a precaution to other First Nations beginning the process of internet network implementation.

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Glossary of Terms

Aboriginal: A person who identifies with at least one Aboriginal group (i.e. North American Indian, Métis or Inuit) and/or who is a Treaty Indian or a Registered Indian as defined by the *Indian Act of Canada* and/or who is a member of an Indian Band or First Nation.

Access Point: An access point is one or more wireless radios that allow any user with a wireless computing device to log-on and access the internet.

Backbone: The primary connectivity mechanism of a hierarchical distributed system. All systems which have connectivity to an intermediate system on the backbone are assured of connectivity to each other. This does not prevent systems from setting up private arrangements with each other to bypass the backbone for reasons of cost, performance, or security.

Bandwidth: Bandwidth refers to how fast data flow through the path that it travels to your computer. It is usually measured in kilobits, megabits or gigabits per second.

Broadband: Broadband comes from the words “broad bandwidth” and is used to describe a high-capacity, two-way link between an end user and access network suppliers capable of supporting full-motion, interactive video applications.

Broadband internet: Technology that enables faster internet access, and as a result allows services such as interactive digital TV and video conferencing.

Community Access Center (CAC): A public place where a local community can use computers, the Internet, or other new technologies. Community access centers can include libraries, schools, community centers, and other public access points. Communities may vary as to which public access points serve as community access centers.

Community Learning Center (CLC): a location that providing Internet-linked computers freely accessible to all community members in a community-based facility facilitated by a learning center coordinator.

Community ICT Network: Internet connectivity infrastructure developed for and by a community that has a focus on community development and service delivery.

Connectivity: The ability to access the Internet and utilize online resources.

Dark Fiber: A fiber-optic strand with no optical transmission equipment. Customers add their own equipment and build their own network, retaining complete control over all aspects of it.

Elder(s): Aboriginal persons who are respected and consulted due to their experience, wisdom, knowledge, background and insight. Elder does not necessarily equate with age.

First Nation(s): A term that came into common usage in the 1970s to replace the word "Indian". Although the term First Nation is widely used, no legal definition of it exists. The term has also been adopted to replace the word "Band" in the naming of communities.

First Nation Council: Governing or administrative body of a First Nation, elected according to procedures laid out in the Indian Act. They may either be an elected or custom council under the Act. The councillors are elected by eligible members and usually serve a two-year term.

Indigenous: Generally used in the international context, "indigenous" refers to peoples who are original to a particular territory. This term is very similar to Aboriginal and has a positive connotation.

Information and Communications Technology (ICT): The use of computer-based information systems and communications systems to process, transmit and store data and information.

Internet: A worldwide system of interconnected networks allowing for data transmission between millions of computers. The Internet is usually accessed using Internet Service Providers.

Internet Service Provider (ISP): An organization or company that provided Internet access to individuals or organizations.

Last Mile Connectivity: Refers to ground that the local provider will cover between the high speed connection at the door to the community and the user's homes and businesses.

Latency: Time taken to deliver a packet from the source to the receiver. Includes propagation delay (the time taken for the electrical or optical signals to travel the distance between the two points) and processing delay. Due to the distance to a satellite and back (over 34,000km each way), the latency when communicating via a satellite connection is at least 270 milliseconds, making interactive services difficult, compared to a delay of about 10 milliseconds across Europe via fibre.

Modem: A modem is defined as a device used to connect the computer to a telephone line, often for the purpose of connecting to on-line services. A modem can either be located internally in the PC, or can be an external device.

Network: A computer network is a data communications system which interconnects computer systems at various different sites.

Network infrastructure: This term refers to the architecture, in terms of equipment and connections that makes up a network.

Optical Fiber: A method of guiding light over long distances with very little reduction on strength (attenuation or loss). A central core of high-refractive index material - usually very pure glass - is covered with a cladding of lower refractive index material. Modern fibres have losses in the order of 0.25 dB/km, so 1 km of fibre has less loss than a pair of ordinary spectacles or reading glasses.

Packet: A block of data. The terms packet, frame, and datagram are often used interchangeably.

PoP: Point of Presence (or Access Node). A site where customers can connect into the backbone network.

Rural: All areas not classified by the Census Bureau as urban are defined as rural and generally include places of less than 2,500 persons.

Rural and Remote Community: Generally refers to a community with a small population base, that may or may not have road access year round or access to services such as health care and K-12 education.

Satellite: Refers to the type of broadband connection where information is sent from and arrives at a computer through satellite dishes.

Voice Over Internet Protocol (VoIP): Technology used to make telephone calls via the internet.

Wireless: Refers to the type of broadband connection where information is sent from and arrives at a computer through transmission towers.

CHAPTER ONE – Introduction

1.1 Preamble

More than a decade after the explosion of the internet in mainstream western society, many rural and remote Aboriginal communities in Canada have become connected to the World Wide Web. In accomplishing this, communities have overcome geographical limitations in becoming connected, financial barriers that exist as a result of the Canadian Telecom situation, and the social barriers to progress that have affected Aboriginal communities in Canada for a number of decades.

The Ktunaxa Nation is located in south eastern British Columbia and includes four First Nation communities in Canada and two tribal communities in the United States. The Ktunaxa Nation Network (KNN) project includes four of the Canadian First Nation communities and began in 2001 as a means to preserve and disseminate the Ktunaxa language. The network launch ceremony was held in March 2007. The use of the internet and related technologies has permanently changed societal functions in most areas of the world and may have changed the daily lives of the individuals and communities of the Ktunaxa Nation. The internet and information and communications technologies (ICTs) are being used in communities to meet different objectives and address a variety of community needs. Greater understanding of current uses of the

internet, as well as the sharing of best practices, may provide insight as to the patterns, risks, and advantages associated with community ICT networks.

1.2 Background

Connectivity, or access to the internet, can be characterized by different qualities of connection. For example, a dial-up internet connection is often unreliable and cannot be used to operate large applications or to download material; a high speed internet connection supports larger applications and enables the downloading and uploading of material; and a broadband internet connection enables the use of ICTs such as telehealth, videoconferencing, and other e-applications related to education and justice.

Information and communications technologies provide the opportunity for smaller more geographically isolated communities to engage with the larger society in economic, social, cultural, and educational aspects. Additionally, some Aboriginal communities, for example the Ktunaxa Nation, have utilized ICTs to enhance cultural and language initiatives and to further the goals of their Nation. The Ktunaxa Nation has utilized broadband connectivity and ICTs for education related programs, language preservation, cultural/historical preservation and learning. Additionally Ktunaxa has established Community Learning Centers (CLCs) where people can engage in skills development, access the internet, use computers, and further their collective and individual goals. Projects involving the internet infrastructure development that have multiple objectives

and applications for the use of ICTs and broadband connectivity have come to be known as community ICT networks. These community ICT networks have been established not only in communities in Canada but internationally in communities in need of development. Lesser developed countries have engaged in the use of broadband connectivity and ICTs for development purposes and to further the goals of communities and community members. Potentially the internet may provide a means through which to increase either community income and/or to develop technology related skills. The numerous uses of community ICT networks are documented using a variety of methods; evaluation, case study, impact reports and many others.

Land and language are two potential uses of connectivity and ICTs that are particularly significant for Canadian Aboriginal communities. For instance, land claims and negotiations can be supported by technology and enable an increased capacity to communicate. Additionally, the management of land and natural resources can be enhanced by the use of ICTs and connectivity in a variety of ways, such as with the use of Geographic Information Systems (GIS). Second, language dissemination and programs can also be supported using the internet and ICT tools, which for many Aboriginal communities, including the Ktunaxa Nation, is a significant issue.

Deeper understanding of the uses of community ICT networks in Canada related to land, language, and natural resource management may inform future investments both by community network directors and governments. Further, this line of inquiry may

enhance current knowledge and understanding as to how connectivity and ICTs might be used in these areas and provide a record of experiences or best practices for those embarking on similar projects.

The traditional territory of the Ktunaxa Nation is shown in figure one. This map depicts the area currently involved in treaty negotiations, both the Canadian and American Ktunaxa communities, and the approximate area of the traditional territory. Figure two shows the Ktunaxa Nation communities located in Canada, including St. Mary's, Tobacco Plains, Lower Kootenay, and Akisqnuq. The fifth community labelled on both figures one and two is Shuswap, a community that was part of the old tribal council called the Ktunaxa/Kinbasket Tribal Council. Today the Shuswap have politically separated and are not part of the Ktunaxa Nation. Figure 2 names the community north of St. Mary's as Columbia Lake which is no longer correct; today this community is called Akisqnuq First Nation. The four Canadian communities are relevant to this thesis and have a population of approximately 1200 people. The Ktunaxa Nation Network (KNN) project aimed to provide connectivity to individuals and families in their homes (approximately 500 homes) and access to broadband connectivity and other ICTs in CLCs and health sites.

The Ktunaxa Nation is a self governing Nation and has identified four pillars that represent the community's interests. The four pillars are 1) Traditional Knowledge and Language, 2) The Social Sector, 3) Lands and Resources, and 4) Economic Investment.

The Ktunaxa Nations vision statement is to

“strive to achieve strong, healthy citizens and communities, speaking our languages and celebrating who we are and our history in our ancestral homelands, working together, managing our lands and resources, as a self-sufficient, self-governing Nation” (Ktunaxa Nation, 2008).

The KNN may enhance community capacity and the ability of leaders and members to address community goals. The network was originally envisioned as a means to disseminate the Ktunaxa language. The First Voices initiative is an online suite of tools

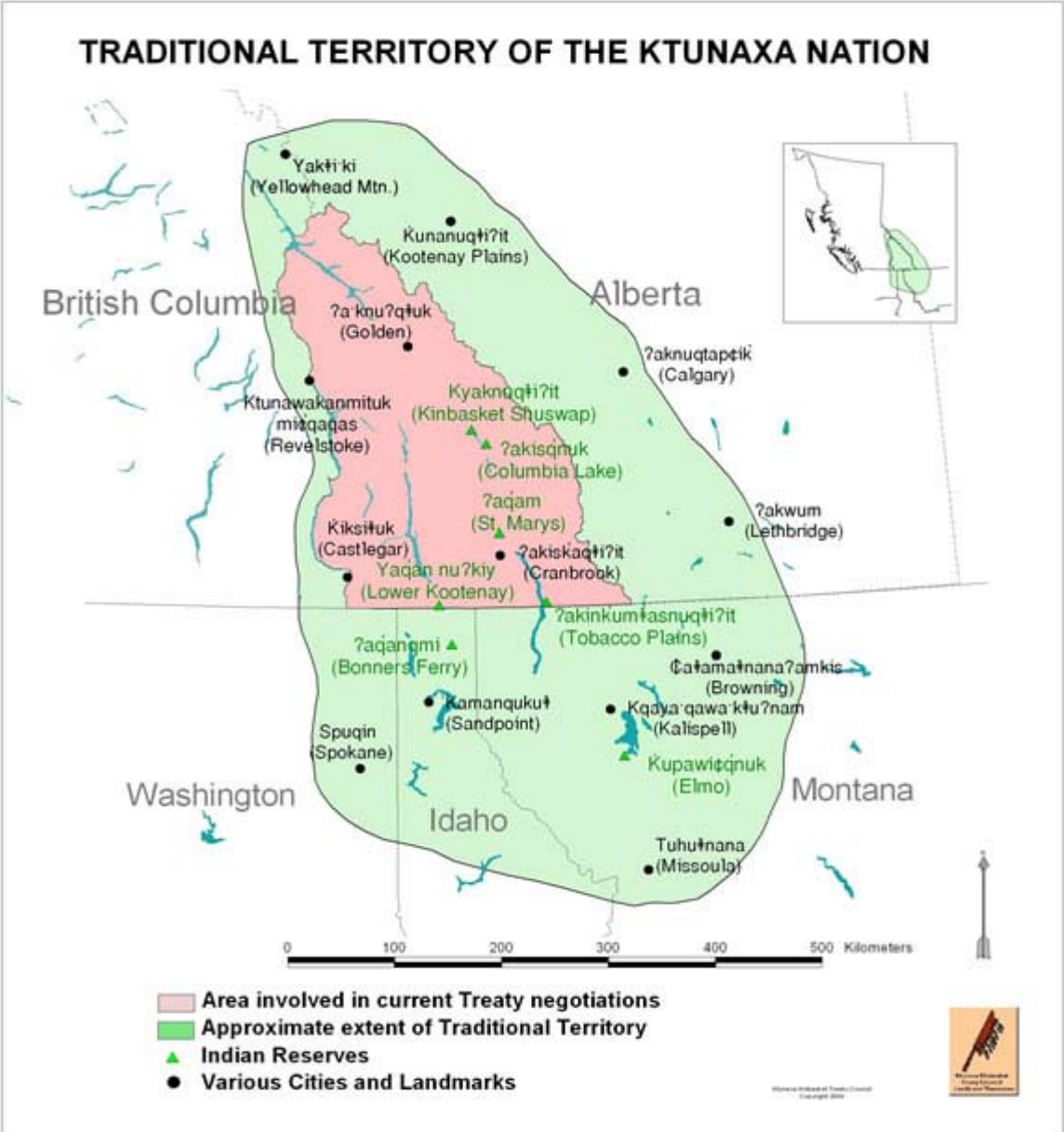


Figure 1: Traditional Territory of the Ktunaxa Nation: including the four communities relevant to this project (St. Mary’s, Akisqnuq, Tobacco Plains, and Lower Kootenay).

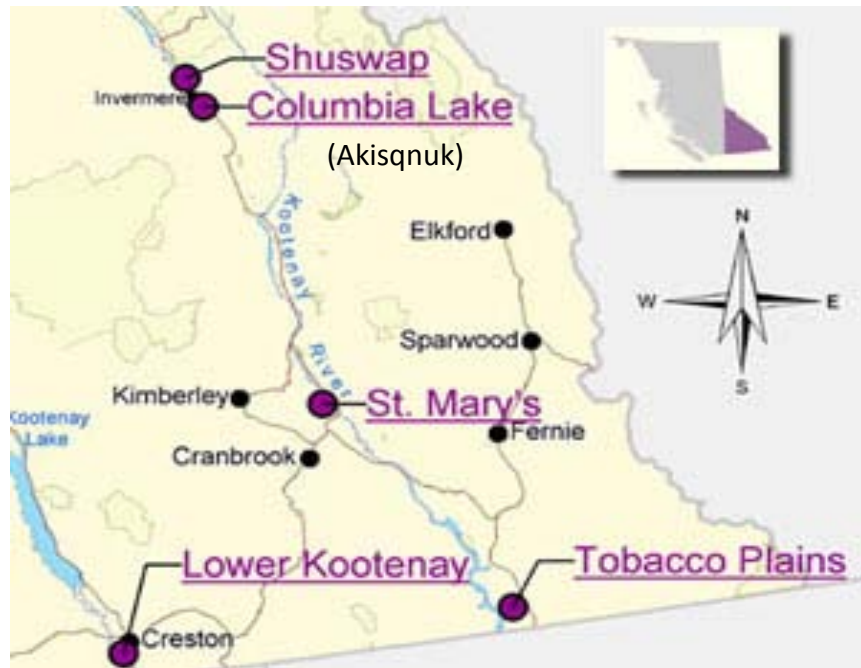


Figure 2: The Ktunaxa Nation communities. (Adapted from: www.gov.bc.ca).

that may enable or further enhance the ability of elders and adults to pass on their heritage, language, traditions and history to future generations. The First Voices website hosts an online language database that can be utilized in variety of ways including games, lessons, and songs. Another initiative enabled by the KNN is the Community Learning Centers (CLCs) project which provides access to computers, the internet, and skills development and training. Broadband internet enables council employees and others to access up-to-date information, to be better informed, to receive and download large documents and maps quickly (often from government and other organizations), and to communicate on a more level playing field with government, industry, and other organizations. Businesses in the communities can utilize (or offer) internet, access

information about competition, and reach a wider array of customers by marketing their products online.

Investigating the current uses of the Ktunaxa Nation Network (KNN) may inform future program and technological investments. The description and analysis of current uses of the KNN can also provide other communities with information related to best practices, community experiences and new opportunities in this area.

The thesis provides data useful to an evaluation of best practices at a larger regional or national scale. An assessment of community ICT projects could provide policy makers and other funders with the information necessary to guide future projects and use the available resources more efficiently and effectively to support community ICT projects. Additionally, better understanding of particular technological tools or best practices would enable project leaders to better focus the resources available and to potentially secure additional supports.

1.3 Opportunity Statement

The uses of the Ktunaxa Nation Network (KNN) are of interest to the Ktunaxa Nation Council, First Nation communities, the First Nations Technology Council, academics, and other indigenous communities and organizations internationally. The uses of the KNN have not been formally examined. Examining the current uses of the KNN may result in a

collection of best practices and may identify potential investments and additional applications, tools or software that could assist the community in achieving their goals and objectives. The outcomes of the project may be of use to the Ktunaxa Nation Council, potential funders, Governments of Canada and British Columbia, and other First Nation communities. Identifying uses and community experiences related to ICT may provide the Nation with data that can be utilized in the future to track change and assess its impact or to secure additional funding for future projects.

1.4 Primary Purpose and Objectives

The primary purpose of this research was to examine the implementation of and explore the ongoing use and development of the Ktunaxa Nation Network, with a focus on uses related to land and language at both a community member and an organizational level.

The research objectives were:

- 1) to describe the access to connectivity and ICTs in the Ktunaxa Nation communities;
- 2) to explore the ongoing use and development of the Ktunaxa Nation Network, with a focus on uses related to land and language; and
- 3) to investigate network uses at the organizational level, specifically use by local businesses and the Nation both internally and externally.

1.5 Research Methods

The methods included: 1) a review of relevant literature and documents that included related academic and grey literature; 2) semi structured interviews conducted with community members including both youth and elders during site visits; 3) the restorying of events that took place during the implementation of the Ktunaxa Nation Network; 4) content analysis using Nvivo included interview transcripts and field notes; and 5) a survey of expert's knowledge via interviews with knowledgeable individuals presently working on projects related to land and language that utilize connectivity and ICTs.

A community member was employed to assist with data collection and logistics. A draw was held for all participants to win a Nintendo Wii, each participant was given one ballot to enter the draw.

1.6 Organization of the study

Chapter one serves as an introduction to the subject area and outlines the purpose of the research, research objectives, and briefly discusses the methods of the study.

Chapter two provides an in depth review of the community literature, academic articles, conference transcripts, and government documents related to the Ktunaxa Nation network and the uses of community ICT networks with a focus on land and language.

Chapter three provides a discussion of the methods employed for this research. Chapter

four presents interview data refashioned using the restorying method to provide a comprehensive account of the events surrounding the implementation of the Ktunaxa Nation Network. Chapter five describes the data collected. Chapter six is an analysis and discussion of the data and results. Lastly, chapter seven consists of the summary, conclusions, and recommendations.

CHAPTER TWO

Community ICT Networks and the Use of Connectivity and ICTs

2.1 Introduction

Connectivity, or access to the internet, has been readily available and utilized in urban centers around the globe providing quality connections to high speed internet services (broadband) and technological innovations as they become available. Broadband connectivity services are provided in urban centers via private companies, namely Internet Service Providers (ISPs). Examples of ISPs in Canada include TELUS, Bell, Shaw, MTS and many others. Private businesses are able to provide these services in urban centers due to the large population base and economies of scale. In many rural, remote and Aboriginal communities in Canada the provision of these services can be more costly as a result of the geographic terrain of the region and hence the type of technology required (satellite, microwave tower, fibre optic lines), while the potential customer base is significantly smaller.

This chapter first describes the importance of access to connectivity and ICTs in Canada, essentially detailing the potential benefits to access in rural, remote and Aboriginal communities and also describing the needs of communities that may be addressed through access to and use of connectivity and ICT. Second, a comprehensive account of the connectivity projects in Aboriginal communities is provided which describes both

Canadian and international uses of connectivity and ICTs. The account utilizes categories that emerged as relevant in the review of the literature and are relatively broad and inclusive. These categories are used to structure both the literature review and the findings of the thesis for comparative and analytical (systematic) purposes. The categories include use related to land, use related to language, economic use, educational use, social use, and use related to health. The chapter then presents a description of the Ktunaxa Nation and Network project as one case of a specific community ICT network project and as described in the literature.

2.2 Access to Connectivity and ICTs in Canada: Why is this Important?

Over the past decade the Government of Canada partnered with communities and other organizations to provide broadband connectivity in rural, remote and Aboriginal communities in Canada based on a variety of objectives that include: to improve access to services, to promote community development, and to build community capacity. In rural and remote communities “distance and low population densities have traditionally resulted in inequities related to technology infrastructure and services when measured against urban centers” (Matear, 2002). Haythornthwaite (2001) notes the importance of understanding the disadvantage that exists for those who do not have access:

“It is important to examine how the increasing presence and importance of the Internet in the everyday lives of those with access separates others from the ongoing social, economic and commercial activity the Internet supports and creates or perpetuates an existing social divide” (Haythornthwaite, 2001).

The divide that exists between urban and rural communities as well as between developed and developing nations, in relation to computer and internet technology has been termed the digital divide. However, some question whether or not lack of access constitutes a new divide between the rich and poor or simply exemplifies and perpetuates a pre-existing divide, based on income and other pre-existing disparities.

Understanding the uses of a network may provide insight as to how certain outcomes materialize. One issue experienced by many Aboriginal communities in Canada is youth migration. In some instances, youth become aware of the disparities between their home communities and urban centers in Canada and are drawn to migrate by a number of factors, usually to seek out a different quality of life. Many community based ICT initiatives are conceived as a method through which to strengthen the connection of youth to language and land. As stated in a study by Mignone et al. (2008):

“The importance of preserving language cannot be overemphasized. One of the central tenets of colonization was the taking of land and the destruction of language and traditional practices through for example residential schools, the outlawing of potlatches, etc. Aboriginal identity is grounded in land and language. There is sufficient evidence suggesting how their loss has undermined the spirit of many communities leading to tragic consequences. It is thus revealing that some connectivity initiatives are spearheaded precisely by the aspiration to recover and preserve language and land” (Mignone et al. 2008).

The number of youth migrating to urban centers increases each year which leads to a diminished connection between Aboriginal youth and the land, and language. These elements are often considered to be the foundations of Aboriginal culture. As the migration of youth to urban centers increases each year, the prospect of reclaiming language and disseminating knowledge of traditional/cultural land use dwindles.

“Aboriginal people in Canada are increasingly urban. In 2006, 54% lived in urban areas (including large cities or census metropolitan areas and smaller urban centres), up from 50% in 1996” (Statistics Canada 2008).

Community ICT networks offer one method of promoting culture and community through the provision of online resources for the preservation of culture and language.

Broadband connectivity enables an increased provision of services such as education and health care. The provision of increased health care and educational services may serve to prolong the ‘life’ or viability of the community by decreasing the disparity in the quality of services between rural and urban centers. Additionally, providing increased educational opportunities enables youth to remain in their home community for a longer period of time prior to leaving to continue their education, an occurrence that in many northern communities happens as early as age 13. The capacity of institutions, organizations, and policies that shape the lives of each community member are strengthened via broadband connectivity.

The notion that connectivity has become practically *essential* to participating in many different realms of society (social, government, economic, culture, health, and environment), places internet access in the category of an essential service, rather than a luxury service. An example of an essential service is Canada postal services and an example of a luxury service is satellite television.

“Broadband is also increasingly the primary mechanism for accessing information. Information is a public good which is essential for all forms of economic activity and good governance” (Kelly et al., 2009).

In Spain, the government has deemed broadband internet services a universal right and is “forcing telecommunications companies to provides speeds of at least one megabit per second to all citizens by 2010” (CBC News, 2009). Another relevant aspect of the experience in Spain is that the Spanish government is requiring services to be provided at prices affordable to everyone, even those in rural areas where providing services can be extremely expensive. According to CBC News (2009), Finland has also implemented a similar policy.

In a recent World Bank report (Kelly et al., 2009), the role of government in broadband development is explored. According to the report, market failures in broadband are not dissimilar to market failures in the provision of other public infrastructure. The creation of monopoly-type structures in the provision of broadband infrastructure (e.g. the dominance of the public telecommunications operator) is not uncommon and has occurred in many countries and “has been a key obstacle in to the development of effective competition in the broadband market” (Kelly et al., 2009). Other difficulties discussed in the report include a lack of economies of scale, “difficulties in obtaining legal permission to operate, inefficient allocation of radio-spectrum, poor information and limited capital markets” (Kelly et al., 2009).

Providing broadband connectivity universally in Canada may reduce the current inequalities related to technology between urban and rural communities. Government

has taken great steps towards achieving this goal in a practical sense without officially designating broadband as a universal or essential service. Subsidizing connectivity infrastructure in rural and remote locations can be considered as a step toward achieving universal access. According to Mataer (2002: 465),

“if the private-sector telecommunications firms can access some publically funded capital assistance, they can often generate a reasonable return on investment from sustainable operational revenues”.

In discussing the contribution broadband connectivity can make toward development, Dutton et al. (2003) state broadband can be seen as “a tool towards achieving legitimate social and economic development objectives relating to existing divides in wealth, education, health, gender inequality and other areas” (Dutton et al. 2003: 35). A more recent description of the use of ICTs and connectivity for environmental purposes has been termed the e-Environment. The International Telecommunications Union states that e-Environment can be defined as being used

“to help observe, describe, record and understand the environment including tools to manipulate and visualize environmental information, to share information and data, to facilitate and help coordinate environmental decision making and management, including risk assessment, mitigation, and management, to help reduce and/or mitigate the environmental impact of human activity, and to facilitate learning about the environment” (International Telecommunications Union, 2008).

The use of the internet, computers and other ICTs has become essential in resources management, as is the case with practically all aspects of both public and private sectors.

The potential of community ICT networks to increase community capacity and address community issues may depend on the model of implementation of connectivity, type of ownership, community involvement, and inter-organisational relationship, all of which dictate the potential and actual uses of the network. The social capital, community capacity and ability to promote project sustainability most likely depends on how and by whom the project is structured, the community needs addressed by the initiative, and the funding available for related education and training programs (Mignone et al. 2008).

2.3 Community Owned ICT Networks

A community owned ICT network refers to the connectivity infrastructure that enables a community to connect to the internet and utilize a variety of services and tools. Once internet infrastructure is in place, a main hub or access center is usually established. The access center provides internet and computer access and may take the form of a Community Learning Center (CLC) or Community Access Center (CLC) or may be located in the local school or band office, for example. Characteristics of the location that signify a community ICT project include a place individuals gather to use the internet and computers and to learn together. The details of network projects often differ, for example the Ktunaxa Nation was able to provide the internet modem free of charge to each Ktunaxa home while other projects rely on potential customers to purchase the modem prior to receiving service.

Community ICT networks generally are owned and managed by the community. The idea of ownership is significant in that those projects in which community members felt the network belonged to them as individuals comprising a community were more successful than other projects in which the community felt the network was owned or operated from outside the community. The latter may result in less interest and investment on the behalf of community members.

Aboriginal owned community ICT networks refer to systems in which service provision of the internet is undertaken by the community and culturally relevant uses of the technology are developed in response to community needs.

Aboriginal community owned networks are run by community people who have an understanding of the values of community members and the issues that can be addressed via the use of technology” (Mignone & Henley, 2009).

The alternative to a community owned network is a privately owned network. The development of an internet network and related services by private companies is based on a business model that assesses the potential return on investment via area population and local economy. Private businesses usually require economies of scale in areas where the number of individuals comprises the pool of potential subscribers and potential revenue sources. Many Canadian Aboriginal communities are located in rural and remote areas considered to be sparsely populated and without economies of scale.

Mataer (2002: 466) defines a community based network as “a non-profit organization that facilitates partnerships between the private and public sector to improve

technology infrastructure and services". Mataer also highlight the wide range of project objectives facilitated by community based network using the examples of "establishing fibre optics infrastructure to hosting technology career fairs for regional youth" (2002: 466). One example of a type of community based network is the telecommunication community cooperative in Pinamar, Argentina.

Box 1: Telecommunications in Pinamar, Argentina

Telecommunication community cooperatives in Pinamar, Argentina have provided telephone and internet access to local residents from 1992 onwards. The network provided free connections to local schools for children and provided low cost phone and internet services for resident use. The main use of the network was by tourists in hotels. Providing services to tourists enabled the cooperative to provide telephone and internet services to local residents at a significantly reduced cost and at times for no cost, enabling local organizations to utilize the services in a variety of ways (Finquelievich & Kisilevsky, 2005).

Without government subsidization affordable internet services in these areas would not be possible. Without government subsidization the monthly cost of connectivity can be prohibitively high. Prior to the introduction of CCNet in Churchill, Manitoba residential internet service as via satellite and cost in excess of eight hundred dollars per month (Cameron et al., 2005). Subsidized funds are generally used to offset the high costs of establishing backbone infrastructure and are granted to project bodies with solid business plans that focus on providing a community benefit. When network funding is

government subsidized the community or communities in question are also required to provide a substantial amount of funding.

“If communities are to risk their limited resources in ICT infrastructure and services when they may be lacking in basic infrastructure such as housing, water, sewage, etc., they must clearly see it as a possibility for socioeconomic development” (Mignone & Henley, 2009).

Industry Canada has provided partial funding for community ICT projects in rural, remote and Aboriginal communities through programs such as Broadband for Rural and Northern Development (BRAND) and the Computer Access Program (CAP). The community initiatives of Industry Canada have taken many different forms due to the adaptive nature and uses of ICTs. Each project aimed to provide connectivity, or access to computers and the internet. Communities have accomplished this objective in many different ways; for example, by providing a community access center (CAC) where community members gather to learn and use computers and ICTs, providing connectivity in administrative and health units, and providing residential connectivity to each community household. “Community networks have much at stake in developing active implementers of technology, rather than passive consumers of connectivity” (Mignone & Henley, 2009).

Community ICT networks are suggested to: 1) provide greater access to essential services (similar to the services provided in urban centers), such as education, training, and health care (Fawcett et al. 2003); 2) increase social connections between family members, community members, between members of different communities through

coordinated initiatives, and between community members and other individuals elsewhere via the internet; 3) increase youth involvement in culture, language and traditional knowledge, consequently promoting the preservation of language and culture:

“There are a variety of ways in which broadband connectivity can assist in the preservation of culture and language. For example, an online Oji-Cree dictionary has been developed that allows users to search categorically for images, sounds, syllabic script and Roman orthographic text” (Mignone et al., 2008);

4) provide economic incentives; 5) provide increased employment and revenues; 6) create online aboriginal networks such as the national Aboriginal Youth Network and My K-Net.org which is the largest culturally based online network in the world (Beaton 2007); 7) increase the communities capacity and social capital through coordinated initiatives (Mignone et al. 2008); and, 8) increase the ability of communities to manage their resources via mapping applications, GIS, increasing land use planning capacity via software applications, and by increasing the capacity of the land and resource sector to communicate and participate with other institutions and organizations, both governmental and non-governmental.

Community networks usually employ a number of ICTs in promoting use and providing services. ICTs include applications that usually involve the use of the internet, for example, MSN, Facebook, BeBo, Webcasting, Videoconferencing, Telehealth, e-Justice, e-Governance, e-Commerce, e-Banking services, GIS, Collaborative Mapping, online language programs, Distance Education and training programs such as Click-to-Learn and Go to Meeting along with many others.

2.4 The Use of Connectivity and ICTs in Aboriginal and Indigenous Communities

The use of connectivity and ICTs in Aboriginal and Indigenous communities includes a variety of project objectives taking place in many different countries. The uses of a network are dependent on the objectives of the project and the needs of the community. Many community ICT networks have been in operation for a short period of time. Once a community ICT project obtains funding a company must be contracted to install backbone internet infrastructure, a process that can take years. For example, the Qiniq network in Nunavut was established under tight project deadlines in a climatic environment where equipment and supplies can only be transported during a four month period. It is not uncommon for internet infrastructure to take one or two years to be built. Once the build is complete, last mile solutions (e.g. connectivity to homes) must be established, a step that frequently requires additional funding. Connectivity problems are not uncommon during the first year of operation in areas considered to be remote.

Patterns of technological adoption indicate that those who are first to become involved with technology and related applications often have a hobbyist interest and are not a majority. The observation of uptake patterns of technology suggest that the first group of subscribers is usually a small group of individuals that enjoy technology itself, while the group that follows (the largest middle group) consists of individuals using the technology to meet routine needs with greater ease, such as switching from faxing office

letters to using email. An additional year to engage community members and promote the network is also not uncommon.

Harrison (2005) reports that there is an underlying assumption that First Nations in Canada are using the internet and ICTs in a distinct manner as compared to individuals residing in urban centers due to the extreme geographical and social environments that exist in many marginalized communities (for example, rural, remote, peripheral, northern, First Nations). The provision of health, education and government services via broadband connectivity is an example of this. Another notion, reported in Mignone et al. (2008), is that rural and remote First Nations, while located where it is most difficult and expensive to provide connectivity services, are positioned to experience benefits from the use of connectivity and ICTs beyond the benefits available to those residing in urban centers with constant access to private and public services.

Understanding the different uses and modes of implementation for community networks may enable a deeper understanding of the uses reported by the Ktunaxa. The Ktunaxa Network was designed to provide services not only to nation members but also to other local municipalities, positioning the Ktunaxa to become the leading service provider in areas other private ISPs previously would not serve due to the lack of economies of scale. The literature indicates, although stated indirectly, that one common aspect of most community ICT networks is an underlying objective or goal to promote and support community development and members (Amariles et al., 2006;

Bhagat, 2008; Beaton et al., 2004; Cherry, 2004; Chreech, 2006; Daly, 2005; Fawcette, 2003; Fisher et al., 2006; Government of Australia, 2005). The following section provides an overview of community ICT network projects and their uses in communities in Canada and throughout the world utilizing the following categories: uses related to land, uses related to language, economic use, educational use, use related to health and social use. As mentioned earlier, these categories are meant to provide a foundation for discussion but are not meant to be exclusive nor understood as components of every project.

2.41 Use Related to Land

Resources Management

Academic literature examining the role of ICT use by First Nations in Canada for resources management or uses related to land in general (e.g. mapping, GIS etc.) may seem limited. However, in a recent study of the impacts of ICTs and connectivity on First Nation communities in British Columbia (Smith, 2008) several literature reviews were conducted; one that discussed resources management and First Nations communities (Rennie, 2006). Rennie (2006) discusses issues related to negotiating and implementing resources agreement; stating that “Internet connectivity can play a pivotal role in a community’s effort to develop sustainable management capacity of its natural resources” (Rennie, 2006: 4). Rennie supports this perspective with three examples.

The first example relates to the Pine Beetle infestation and the management of resources exclusively at the local level. Rennie discusses the notion that environmental issues, such as the Pine Beetle infestation, do not occur according to boundaries created by provinces or treaty. According to Rennie this example illustrates the inefficiency of governing all natural resources at the local level; pointing to the benefits of cooperation and access to international research to assist communities in “combat[ing] and contain[ing] widespread environmental crisis” (Rennie, 2006: 5). Further, Rennie (2006: 5) states that “communication and dissemination are essential to province wide resource management, because there is a fundamental need to link the local to the global when dealing with major challenges such as these.”

The second example uses computer technologies (the internet and ICTs) for resources management by Nations to link a number of bands. Specifically, a pooling of

“natural resources management expertise, personnel, and information” that incorporates “human resources, technical expertise, and standardization... clearly defines a variety of roles that can be played by computer technologies” (Rennie, 2006: 6).

Allocating resources management to the level of the Nation rather than the band would require the use of a variety of ICTs and internet connectivity, as a reliable internet connection is required for prompt communication and data transfers including relevant tools such as interactive maps. In other words, internet access would enable a more comprehensive and centralized approach to resources management through which each band can provide local information effectively to create a stronger foundation of information on an issue.

The third example Rennie provides is the use of internet connectivity to negotiate fishing rights, which may preserve a cultural element for many First Nations. Many First Nations in British Columbia are currently in the process of treaty negotiations that regularly involve a discussion of fishing rights. Rennie (2006), states that

“As with other cultural initiatives, it is likely that increased connectivity among First Nations groups can assist in coordinated legal action, ensuring equal arrangements across the province” (Rennie, 2006: 7).

In discussing both the positive and negative aspects of technology, Rennie (2006) discusses its roles in Salmon farming and increased competition in the resource sector. Rennie (2006) raises important questions related to engineered products and treaty rights: “if fish aren’t *caught* per se, will treaties still guarantee that First Nations groups receive their share of profits?” and also, “In their efforts to return to traditional practices of fishing for good and ceremonial purposes, [are] BC’s First Nations...slowly cutting themselves out of a profitable industry?” (Rennie, 2006: 8). These issues require the consideration of those attempting to integrate technology into the resources sector. Further, Michael & Dunn (2006) suggest that GIS mapping could be used to assist in land claims and to map Indigenous language groups over large areas.

Inter-organizational Communication

Another use related to the management of resources can be termed inter-organizational communication. Increased access to information improves a community’s ability to interact with other organizations including governments, businesses (resource

development corporations such as forestry, mining and fisheries), and other administrative units. This type of communication might include, for example, large file transfers (e.g. land use maps or government reports) and enables more equitable participation in areas of community administration and governance (Daly 2005). Access to information including the ability to quickly receive and download files from governments and resource developers enables increased participation in the management of community resources (Michel, 2002). One example of this is the Yukon Online Land Use Planning Atlas which makes land use data accessible to governments and stakeholders. The Atlas also supplies tools that assist the Planning Commission and local First Nations to coordinate and organize land use activities (West, 2009). Similar online portals have also been developed for water resources management in Newfoundland through which water data is now available over the internet for government departments and other stakeholders to view (West, 2009).

Geoportals that Facilitate Access to Information

Tools aimed at facilitating interaction between First Nations and departments of the Government of Canada serve to create an equal playing field in a variety of areas, for example, treaty negotiations and resources management. The provision of equal access to technologies and capacities for all parties involved enable more efficient partnerships between parties.

A Geoportal can be described as “World Wide Web gateways that organize content and services such as directories, search tools, community information, support resources, data and applications” (Maguire & Longly, 2005). Geoportals are commonly used to find and access geographic information or geospatial information. One example of an online portal is the Cree Geoportal which was established by the Cree Trappers Association and provides a view of the traditional territory for tourism and the general public. The portal is used by trappers and communities for administrative purposes to keep track of outfitters and cabins (West, 2009).

The GeoBC gateway is another example of an online portal. GeoBC, developed by British Columbia’s Integrated Land Management Bureau in partnership with the First Nations Technology Council (FNTC), aims to improve local access to Geospatial data and other related government information. GeoBC is a webportal that provides spatial analysis services including a lands and resources data warehouse, mapping, and a crown land registry (Gowan, 2009). According to Gowan (2009), the newly created First Nations GeoBC Gateway (online portal) provides improved access to geospatial data for First Nations and is centred on governments sharing information more equitably than in the past.

Geoconnections is also a geoportal and an initiative that focuses on community development and capacity building through access to information that incorporates the National Canadian Geographical Infrastructure initiative. Geoconnections has also

incorporated a geospatial search and reference application that enables users to select an area and find out what environmental plans have been completed in the area. The program provides online access to these plans as well. West (2009) states that this initiative provides access to geographic information, and information related to lands and waste, Aboriginal economic development, treaty, and aboriginal governance information. Geoconnections can be viewed at www.geoconnections.org.

Another initiative of Geoconnections is the First Nations Shared Information Services; a multi-agency system that will coordinate situational awareness between provincial, federal, and municipal governments. This initiative will standardize the transfer of data to better coordinate different levels of government. For example, one project within this initiative is the Wild Fire data exchange program that enables managers of wildlife events to view current maps of the situation online in real time. In discussing the role of internet technologies in resources management in rural and remote communities in British Columbia, Smith (2008) states that "Internet technologies can play a critical role in resources management, allowing British Columbians to better track the sustainability of our policies and the impacts of our practices" (Smith, 2008: 15).

An initiative aimed at increasing information available to communities has been developed by the Geomatic Services group. Indian and Northern Affairs Canada (INAC) formed the Geomatic Services Group to provide government program information available online and to create online links embedded within maps (LeChance, 2009).

Geomatics is an initiative based on information management infrastructure, tools, and services. The process aims to integrate information from different departments in map layers. This program is an example of an ICT tool that incorporates connectivity in the management of lands and resources that is especially relevant to First Nations communities. The Geomatic Services Group is developing a tool called the Geoviewer.

The Geoviewer is an online program that employs the use of web mapping, has automatic daily updates, and manages roles, users, maps, themes, and context. This tool provides access to government information and can be found at Geoviewer.inac.gc.ca and will be provided to communities, upon request, with a password for security. Within the next year this program will add more provincial information, attempt to partner with Google to access their existing imagery service (Google Earth), and will also incorporate natural resources government information into the map. Information that is available through the mapping program now includes Canada Land Survey Records System, Natural Resources Canada's (NRCan) Survey Parcels (with a link to the survey plan), NRCan and INAC's land parcel information, and in the future will also include their land registry data (LaChance, 2009). The program has the ability to include access to additional information. The program enables users viewing a map to input a point ($-x + y$), or location coordinates, and receive line measurements in kilometres or miles. Also, users can measure irregularly shaped areas. Today, public users are able to email and print maps in PDF format, access population data and topographic lease maps, and request to create user accounts that enable users to select specific spatial attributes.

The Geoviewer is an initiative of both INAC and NRCan. The data available today is housed within the land survey division of NRCan and utilizes their GIS system (LeChance, 2009).

Access to Information

Access to information has emerged as an important theme significant to First Nations in Canada. An evaluation of the United Nations Educational, Scientific, and Cultural Organizations (UNESCO's) Community Multimedia Centres (CMC's) in Latin America, Africa and South Asia highlights this theme. CMC's are similar to the CAC's and CLC's that have been previously discussed. Creech (2006) describes one case study of a community ICT project in which internet capabilities were provided to local radio stations.

Reportedly, community members used the internet to access news and weather information, various farming information, agricultural techniques, and information related to micro-financing and small business loans for women. The ability to access this information may serve to impact the livelihood outcomes of those in rural or marginalized communities both abroad and locally.

Energy Conservation

A small remote community in northern British Columbia has taken action to reduce their energy consumption and has employed ICTs and connectivity to accomplish this goal. This case provides a detailed example of a First Nation utilizing connectivity to meet

goals associated with land and environment that may be applicable for other communities.

Hartley Bay is monitoring their energy use via Smart Meter technology in order to become more energy efficient. Hartley Bay can only be accessed by boat or float plane and has boardwalks instead of roads in the community due to the mossy terrain. The community is home to 180 people and about 450 people live off reserve in the Gitga'at territory. Hartley Bay is primarily a fishing village and has wireless broadband access to the internet which makes the energy efficiency program possible. One objective of the program was to minimize peak demands for power, for example between 5 and 8 pm. When energy use is spread out (as opposed to being used excessively during peak hours) the cost of energy is reduced. Residents at Hartley Bay pay .35 - .50 cents per kilowatt hour, in comparison to many urban centres which pay approximately .5 cents per kilowatt hour.

One environmental issue faced by the community and related to the new energy efficiency program is diesel contamination. Health Canada maps show that Hartley Bay has the worst contamination of diesel in Canada. To discontinue using diesel, Hartley Bay is working to obtain funding for a small hydro electric project in partnership with surrounding communities, INAC, and province of British Columbia. The hydro electric dam project estimated at 9 million dollars for a 900 kilowatt turbine and is projected to be completed sometime in 2010 (Benton, 2009).

The company providing the energy efficiency services (Small Energy Group, www.smallenergygroup.com) began by observing energy use in the community and working to reduce energy use where possible. For example, one of the first patterns observed was 400 kilowatt spikes in energy use that were found to be water heaters for the gym showers in the school that were no longer being used. The gym water heater was turned off which resulted in savings of both energy and money. Another change that was made by Small Energy was the timing of heating delivered to the band office. Rather than heating the building to 22 degree continually a timer was installed that heated the building during the hours it was being used only. Further, the Small Energy Group discovered that homes that were not occupied were still being heated; turning this heat off resulted in further energy savings. Each example listed was discovered by Small Energy Group, located in Vancouver, who monitored energy use using remote energy management software. This was made possible by the broadband internet connection in the community (Benton, 2009).

The energy efficiency program utilises a 'dashboard', or Smart Meter, that enables residents to see how much power they are using (per household). When power drops significantly or is significantly higher the company notifies the community. The dashboard displays live energy use and the statistics are stored that show the correlations with weather. The province of BC will be installing Smart Meters in 1.5 million homes. The new energy program also enables Small Energy Group to remotely

turn off hot water tanks when they are not being used and includes remotely controlled thermostats (Benton, 2009).

2.42 Use Related to Language

The use of ICTs to promote indigenous language and cultural revitalization has been studied only over the last decade. In discussing the potential uses of ICT for the Badimaya people of the Lake Moore area in Western Australia, Michael & Dunn (2006) relay research observations dating back twenty years. For example, Dunn reported that in the early 1980's, Badimaya people were concerned their language would become extinct and began to record it. Dunn & Michael (2006) assert that had "multimedia footage of Badimaya speakers conversing" been captured, remaining individuals of Badimaya descent may have been able to view them and learn not just language but potentially "sacred locations, people participating in sacred rituals, and even live song and dance performances" (Michael & Dunn, 2006). The authors also suggest (for the Badimaya) that historical documents be digitally scanned and made available for access.

Similarly, the Anangu (Pitjantjatjara and Yankunytjatjara people of southern Australia) have established an archive database and recorded over 60,000 (as of June 2006) traditional and historical items. The archive database functions as a viewer (to view material) but also as interactive and collaborative software that enables the Anangu to add metadata and other descriptions as needed. Their use of computers and technology

in cultural and language documentation and dissemination is of interest as a method of revitalization involving the use of technology. The Anangu are a small population spread over a vast and harsh geographic terrain. The archive database enables the dissemination of traditional and historical materials. The success of this project is reportedly due to the notion that the archive database “was never presented to Anangu as a ‘service’ designed and delivered from the outside, but as something that is wholly owned by the Anangu” (Hughes & Dallwitz, 2007).

“Digital archiving of cultural information and media production with Aboriginal content has gathered pace over the past decade” (Singleton et al., 2009). A variety of ICT tools can be used in the revitalization of an Indigenous language. Examples may include online databases that store digital archives of recorded language, online dictionaries, keyboard layouts that swap English letters for those of the traditional language, collaborative web portals that enable multiple users in various locations to add text in the forms of words, stories, pictures, etc. Additionally, a recent presentation related to the use of ICT by Indigenous people conveyed a project in which an Indigenous language spell checker is being developed.

“There are a variety of ways in which broadband connectivity can assist in the preservation of culture and language. For example, an online Oji-Cree dictionary has been developed that allows users to search categorically for images, sounds, syllabic script and Roman orthographic text” (Mignone et al., 2008).

Lieberman (n.d.), discusses the creation of an online open collaboration Indigenous language dictionary which provides translations for 56,000 Swahili words, a group that Lieberman states is spread across the globe. Without the internet the dictionary would

most likely not be utilized and would be difficult to contribute to (Lieberman, n.d.).

Another tool discussed by Lieberman includes the “machine translation software that permits automatic translation from Mapudungun to Spanish and vice versa”, a tool designed to be utilized by other Indigenous groups for similar purposes.

Additionally, Lieberman (n.d.) asserts that computer-assisted language learning will become more prominent within Indigenous communities as computer and connectivity become more available in Indigenous communities. As he notes, “With the increasing power of ICTs, even the smallest linguistic groups can create resource materials and literature” (Lieberman, n.d.). The specific technological tool being referred to is desktop publishing technology which enables “community groups to publish newsletters, magazines, and literary journals” and can be used by knowledgeable individuals to “document and disseminate their knowledge in their own Indigenous language” (Lieberman, n.d.).

The Ktunaxa Nation Network (KNN) offers access to a variety of online programs such as ‘Ktunaxa, I Remember’, which provides a record of past memories and current experiences such as traditional teachings via audio and video files and the “First Voices” program that houses the audio recordings of the Ktunaxa language. The ‘First Voices’ program offers a variety of online tools, games and songs intended to assist in learning Indigenous languages (First People’s Cultural Foundation, 2003). The Ktunaxa Community Learning Centers (CLCs) have been established offering a “physical space for

community members to access high-speed internet for education eg: online language class, health, research, and technical assistance” (Ktunaxa Nation, 2008).

Sam (2009) states that podcast videos are being used in conjunction with the First Voices initiative for language retention and to disseminate language programs to community members. A Ktunaxa language keyboard layout has been created which displays Ktunaxa letters (including accents) and is facilitated by an online tutorial explaining the keyboard layout (Sam, 2009).

2.43 Economic Use

The provision of broadband connectivity services via a community ICT network may serve to provide a variety of economic opportunities for the community such as a community ISP, or newly created technical positions in the community such as telehealth coordinator. Many economic incentives related to the use of telehealth are cited throughout the literature pertaining to community ICT networks (Hogenbirk et al., 2006; Rowlandson, 2006; Fisher, 2006; Beaton, 2004). Essentially, once basic health services can be provided in the community via telehealth (essentially teleconferencing with a doctor in a southern urban center), the cost of travel for health reasons is drastically reduced (Beaton 2004; Mignone, 2008; Fisher, 2006; and Rowlandson, 2005). For example, in discussing K-Net’s telehealth system, Hogenbirk et al. (2006) refer to savings of approximately four million two hundred thousand dollars.

The objective of a telecenter project in Colombia was to enhance economic opportunity however, local people found using the telecenter for economic purposes (such as a job search) to be inappropriate. Many people in the community reported a lack of education as one of the main reasons they did not utilize the telecenter services (Parkinson & Ramirez, 2006). Unlike K-Net, the Colombian telecenter seemed to be lacking community buy-in and does not seem to respond to a community identified need, as individuals felt the proposed use was inappropriate. Online capability can facilitate numerous economic applications not considered here such as online or e-banking.

The Qiniq network connects 25 Inuit communities in Nunavut to broadband high speed internet deployed by two project partners; the Nunavut Broadband Development Corporation (NBDC) and SSI Micro. Once established, a financial services project was launched that examined the opportunities for delivering basic banking services to all Nunavummiut. In 2006, only three of Nunavut's 25 communities had teller service and of those none ensure service in the Inuit language (NBDC, 2006). "In the 2001 census, 70% reported Inuktitut as their mother tongue", essentially causing the teller services available to inaccessible to many (NBDC, 2006). The proposed banking services would provide Nunavummiut with similar advantages or benefits as experienced by individuals elsewhere in Canada. The Qiniq broadband network enables the provision of banking services in all 25 communities. Although this project has not yet been completed the project team continues to work towards this goal.

2.44 Educational Use

The provision of alternative educational options via the use of connectivity and ICTs is significant in that Indigenous people have, in the past, had negative experiences with mainstream schooling, which stems in part from Canada's residential school system. Providing Indigenous students with alternative methods to complete their schooling affords students in remote communities more opportunities to be successful (Swab et al., 2001).

Morrison (2000) discusses an ICT project, taking place in Indigenous communities in Australia, focused on the benefits of the use of connectivity and ICTs for students living away from home to complete their schooling (Lloyd, 2003). Students used the internet, computers, and video-cameras to capture the experience of attending school outside their community, an inevitable outcome for youth in communities without high schools. Specifically, students were given video-camera's to use during their next school semester away from home. The students then uploaded the images to a community website and posted descriptions of the images that could be viewed by younger children still attending school in their home community; which was only possible as a result of their newly established community ICT network.

Students also used the technology to communicate with friends and family while away at school, and used applications such as MSN and other chat boxes. Ramirez et al. (2004), reports that the use of videoconferencing for education by Keewaytinook Okimakanak community members includes a teacher in one community broadcasting their lesson via the internet to four or five classrooms in other communities. Having access to distance education has motivated adults to complete GED programs online (Beaton, 2004).

Bhagat (2008) completed a survey of school children involved in an ICT project at their local school and in their community to determine what the impacts of connectivity and ICTs might be on the lives of the children. Children used the computers to search the internet for school assignments and as a result obtained computer skills and comprehensive knowledge of the English language. Children used the network to learn about other regions in the world which, according to Bhagat (2008), resulted in a broader world view.

Thus far the discussion has focused on access to computers and the internet in rural and remote communities. In an urban setting the issue of access does not relate to physical access per se but perhaps access is limited by economic means. The Wiichiwakanak Learning Centre, located in Winnipeg, Manitoba, Canada provides culturally relevant programs to Aboriginals. The Centre has also integrated the use of computers and technology into their programming. The centre has 20 computers, Cree language

courses, and a homework program. The homework club enables young people to complete homework assignments and better understand computers, the internet, and other educational programs online.

2.45 Use Related to Health

Telehealth may represent the most integrated and widely used technology system that incorporates technology and connectivity, providing health services in rural and remote communities around the world. The Canadian Society of Telehealth promotes the “elimination of distance in the practice of healthcare and wellness” (Canadian Society of Telehealth, 2009). Telehealth services are available in every province in Canada. Similar web portals exist discussing the use of telehealth in India, China, Argentina, Australia, Bangladesh, Mexico and many other countries.

One Canadian success story involving telehealth is K-Net, a community ICT network in north western Ontario that has invested in and reaped the many benefits of telehealth (Beaton, 2005). K-Net’s telehealth project has been widely successful and is composed of 25 telehealth units as reported by Fisher (2006). A telehealth unit is essentially a ICT tool that assists a telehealth coordinator in taking basic measurements that would usually be taken by a General Practitioner (e.g. heart rate, blood pressure, looking into throat and ears) while on videoconference with a doctor in a southern hospital who can interpret the test results and analyze measurements (Mignone et al., 2008). Rowlandson

(2005), states that, where possible, communities may utilize x-ray technology while others find dermatological applications more useful. In other words, the uses of telehealth are usually determined by the needs of the community (Rowlandson, 2005).

Non-health related uses of a telehealth unit will also vary by community. For example, communities may utilize e-justice applications, private counselling or psychiatric applications via their telehealth unit. Hogenbirk et al. (2006), also reports on K-Net's telehealth project in an independent evaluation, and states community members used the telehealth unit for health services previously unavailable and also diagnostic purposes, which resulted in a savings of four million two hundred thousand dollars formerly used for health transport. Telehealth stations are also being used as a mode of training and employment, to connect youth and elders from different communities, and for certain medical specialties (Rowlandson, 2005).

2.46 Social Use

Those that discuss theories of adoption related to ICT use commonly cited social factors as the primary uses that motivate technological adoption (Smoreda & Thomas 2001, Harrison 2005). Consider, for example, a retired parent that did not use computers or technology extensively in their working career. This person will not go out of their way to learn to use technology unless it meets a need and offers a superior method for performing a task the individual is already invested in (Harrison, 2005). However, the

technology generation continues to expand their knowledge and use of technology and ICTs (iPhones, Mobile Me, Blackberry, Skype, YouTube, and Google Tools) and are able to integrate these tools into their daily lives. The older retired person will only be motivated to integrate a new technology that better performs a current task and is easy to use. Skype would be a good example of this for communicating with family members in distant locations. Another appropriate example refers to an ICT project in rural New Brunswick. An assessment of this project revealed that residents used connectivity to work from home, for online purchasing and banking, for entertainment, and for trip savings (Selouani and Hamam, 2007). Many companies, including travel companies, offer reduced prices for individuals that book online. In this case, residents also stated the online activities engaged in were not new activities but were instead pre-existing tasks completed in a different manner, a notion that supports Harrison's (2005) view discussed earlier. For example, people that use banks are not engaging in a new activity when they bank online, they are engaging in an old activity using a new method.

In stating that the initial uses of ICT and connectivity are social, there is an underlying assumption that initial uses are social in the sense they are initially used for communicative purposes and have a basis in reality. It is unlikely, however not impossible, that an individual might *begin* their use of computers and the internet by, for example, creating an Avatar (text-based and graphics-based multi-user highly interactive figure used in a role playing game with other online users) and engaging in

virtual reality for extensive amounts of time. Following are some examples of initial uses that constitute social adoption of connectivity and ICTs.

Two rural shires in southern Australia aimed to integrate the use of computers and the internet into daily use in community offices for administrative and other purposes. A community ICT network was established to meet the needs of this project and several others in the vicinity. The network was used in the offices for creating a community website, email, and the creation of a community learning project. However, some project participants expressed misunderstanding and confusion related to the project and also reported feeling they lacked the capacity to use the technology effectively which resulted in frustration (Lennie et al. 2005). Additionally, a different project in Australia reported functional connectivity and use of ICTs by council staff during a pilot project in four rural and remote Indigenous communities in northern Australia. Indigenous trainees were reported to have engaged in web surfing, email, and other internet related tools (Morrison, 2000).

Another community network named 'n-Louge' implemented in a rural area in India was examined by Jhunjhunwala et al. (2004). The uses reported include: use of video mail and email, popular use of computer training courses, children utilizing typing courses, villagers making resumes, photographic capabilities were utilized for government forms and veterinary applications, and children created greeting cards.

Lastly, an assessment of the contribution of ICTs to development projects examined a Colombian telecenter in relation to social equity using a sustainable livelihoods framework as a tool. Parkinson and Ramirez (2006) state that the network was used for telecenter services such as, printing, copying, faxing, and educational purposes (students using the computer for homework assignments and the internet for research).

In discussing the social use of connectivity and ICTs there are two distinct views in the literature. The first view perceives internet connectivity as supplementing face-to-face relationships while the second perceives internet connectivity as detrimental to face-to-face relationships. There is a wide variety of literature on this topic and variations on the debate. One study that discusses the issue, using data from a 1998 survey of 39,211 visitors to the National Geographic Society Web site, revealed that “people’s interaction online supplements their face-to-face and telephone communication without increasing or decreasing it” (Wellman et al., 2001). Additionally, Smoreda and Thomas (2001), point out that in order for anyone to adopt a new communications technology they must have someone to communicate with. For example, phone, fax and online chat all require the presence of another individual receiving the communication.

The use of the internet and ICTs in rural, remote, and Aboriginal communities may be perceived as one method of increasing community capacity and capabilities. A discussion paper produced by Australia’s Department of Communications, Information Technology (2005), and the Arts examines the role of ICT in building communities and

social capital. The paper suggests that ICT has the potential to “contribute to positive community and social outcomes for Australia, aiding is social cohesion and the building of regional information economies” (Government of Australia, 2005). One study (Dickinson, 2005) examined the potential of the internet in rural Canadian communities to “alter the fabric of rural identities, by changing the degree of community social cohesion, community togetherness and sense of identity”. Dickinson (2005) found that: internet adoption in rural communities did not lead to diminished socially cohesive tendencies of the residents; internet helped to create denser social networks (particularly email); and that despite building denser social networks, the internet did not actively build social cohesion within the studied communities. This study further supports the notion that connectivity and ICTs are tools that can mobilize individual and community efforts towards achieving a specific goal.

In India many ICT projects exist in the form of internet kiosks, which are similar to what have been discussed as Community Access Centres (CACs) or Community Learning Center (CLCs) previously and below. Kiosks provide a public physical space where local residents can access telecommunications (phone, radio, internet, computer, fax, printer etc.) and receive different types of skills and development courses and training. Kumar and Best (2006) examined five kiosks in rural India established by a project called Sustainable Access in Rural Indian (SARI) that is reported to be operating 30 kiosks in Tamil Nadu since June of 2003. One of the main findings by Kumar and Best (2006) in their examination of kiosk users was that the services were being utilized mainly by

individuals that had a higher socio-economic status and level of education than the average person in their community. Those most likely to use the kiosk were also the most likely to read a newspaper. Reported uses included accessing newspapers online, radio stations online, and weather information.

The uses made of community ICT networks vary from project to project and usually focus on meeting a community need and on community development. The six categories utilized in the previous section are thought to capture a wide array of uses while providing a structure and a foundation for discussion. Understanding the complexities of one project may provide a deeper understanding of the potential benefits of connectivity and ICT for the community involved and for community networks generally.

2.5 The Ktunaxa Nation and Network

The Ktunaxa Nation is comprised of communities located in south eastern British Columbia, including four band locations that have been connected to the Nation owned internet network. The network area is located in a valley surrounded by both the Rocky Mountains and the Purcell Mountains. The network area is approximately 17,871 square kilometres in size and includes 13,989 people, 8602 dwellings, 182 businesses, four band locations, and 58 unincorporated communities (Ktunaxa Nation, 2008). Rural East Kootenay residents have been connected to the seven million seven hundred thousand dollar broadband Ktunaxa Nation Network (KNN), an open access network, since March

2007. “This network consists of a series of towers to provide wireless service and fibre to the user (FTTU) in the East Kootenay area” (Ktunaxa Nation, 2008). The need for broadband communication arose from an initiative to preserve and disseminate the Ktunaxa language. The Ktunaxa Nation Council was formed in 1970 to promote the

“preservation and promotion of Ktunaxa traditional knowledge, language and culture, community and social development and wellness, land and resource development, economic investment and self-government” (Ktunaxa Nation 2005).

The Ktunaxa people reside on their traditional territory and are comprised of six bands. Four bands are located in British Columbia and two spread across Montana, Washington and Idaho. One band in British Columbia has politically separated from the Nation. The KNN was partially funded by the Regional District of East Kootenay (RDEK) and Industry Canada’s Broadband for Rural and Northern Development (BRAND) program. The uses of connectivity and ICTs along with evaluating or assessing the outcomes of community ICT networks has become a topic of interest for communities, stakeholders, and academics (Ramirez 2007; Ramirez 2005).



Photo 1: Wireless tower at Tobacco Plains.

The KNN was originally envisioned as a means through which to preserve the Ktunaxa language. Don Maki, the Director of the Traditional Knowledge and Language Sector, was aware of the pressing need to record as much of the language through meetings and storytelling as possible (Mignone et al., 2008). In a recent interview (July 23, 2009) Maki states “24 of ... 48 fluent speaking elders [have been lost] since 2002. Now the oldest speaker is 90, and the youngest 62” (Xinhua, 2009). In the past the Ktunaxa language had been recorded using hand held tape recorders at community and elders meetings. The recorded material was later digitized in hopes of developing and disseminating an online language program to assist youth in learning the language. The internet connections available in the Ktunaxa communities were dial-up and consequently the digitized language files and online language programs could not be

disseminated without a higher quality, faster internet connection. The Ktunaxa language is unique among Native linguistic groups in North America (Ktunaxa Nation, 2008).

The Ktunaxa Nation applied to Industry Canada's Broadband for Rural and Northern Development (BRAND) program to obtain funding to improve their internet connectivity infrastructure and was successful. The Nation was awarded three million eight hundred thousand dollars provided they could develop an effective business plan and attract other organizations to match the funding provided by Industry Canada (Ktunaxa Nation, 2008). The initiative is unique among Aboriginal community networks in that the customer premise equipment (similar to an internet modem), which carry a significant portion of the initial cost of becoming connected to the internet, which may cause resistance to technological adoption, were provided free of charge to residents in the Ktunaxa communities (Maki, 2007).

2.6 Chapter Summary

The literature reviewed in this section included academic articles, government reports, community reports, website content, conference materials and other grey literature and provides an overview of the importance of access to community ICT networks, the importance of community ownership, a review of uses, and a description of the Ktunaxa Nation network and project.

Community ICT projects have great potential for community development and assisting disadvantaged communities in improving their livelihood outcomes and opportunities. Better understanding the pre-requisites of successful projects and community elements that may affect the outcomes of a community ICT network will assist those directly involved in ICT projects and those involved at the level of research. Information and Communication Technology (ICT) network projects are usually conceived as means through which to provide tools for use that respond to community identified needs and consequently the objectives of the project depend on the location and needs of communities. For example, the broad objectives of the project may be to increase social equity in the community, to provide access to ATM banking services, to increase the quality and access to health care, or to preserve a language. However, each project seems to incorporate similar approaches in achieving these goals that relate to community development and capacity building.

One of the key trends or patterns that emerged in the review of literature is the intention to use connectivity projects as community based initiatives that focus on enabling individuals to realize economic, social, cultural (land/language), health and educational opportunities via the internet, computers, and related technical skills. Improving livelihood outcomes, community capacity and the capacity to manage and govern communities and resources through the use of the internet and computers as development tools are general goals. The linkages between these goals and ICTs are rarely direct and consequently understanding that the internet and computers are

merely tools that do not function without the appropriate human capital and necessary resources is a key concept in thinking about and understanding issues related to this topic.

Three main themes emerged from the review of literature. The first theme, very generally, is that community ICT projects have enhanced the ability of rural community members to engage with mainstream society. A second theme is that the use of connectivity and ICTs varies almost by community but also that projects almost inevitably have a focus on community development and community capacity building. A third theme highlights the ability of individuals to seize opportunities through ICTs and the internet and to use these tools to better their livelihood outcomes. In many countries around the world community networks have been established in communities in need of development. The uses of a network that relate to land and language will often be predicted by the circumstances of the community, their land claim status (or alternatively status within their country), degree of self governance, status of their traditional language and organizational capacity. However, marginalized Indigenous communities both in Canada and internationally have utilized a variety of methods to institute the use of community networks and ICTs that promote culture, preserve language and reassert traditional land related values and value based land use.

Methods used for studies and projects related to community ICT networks utilize a variety of methods including interviews, focus groups, analysis of internet data usage,

researcher observation, case study, case description, impact assessment, video archive research, sustainable livelihoods approach to impact assessment, and project evaluation.

The thesis explores access to connectivity and ICTs in the Ktunaxa Nation communities, the uses of the Ktunaxa Nation Network and the network uses at the organizational level, namely that of local businesses, the Nation, and in relation to government. The literature describes the importance of connectivity and how this related to specific geographic and cultural realities of rural and Aboriginal communities and highlights the importance of community ownership. The literature reveals that the use of connectivity and ICTs can be grouped into general categories including use related to land, use related language, economic use, educational use, use related the health, and social use. While community ICT projects vary in their objectives or project goals building skills and thus enhancing human capital and community capacity seem inevitable.

CHAPTER THREE - Methods

3.1 Introduction

This research explored the uses of the Ktunaxa Nation network and focused on uses related to land and language. This study was qualitative and included an in-depth exploration of the uses of the Ktunaxa Nation Network by Nation members, network staff, Nation council employees, local businesses in the Ktunaxa Nation communities. This research addressed the question “What is the Ktunaxa Nation Network (KNN) being used for, especially in the areas of land and language and by whom.”

The following section describes the methods associated with this thesis including the strategy which was exploratory case study and triangulation, the literature review which included grey and academic literature as well as conference proceedings, semi-structured interviews and purposive sampling, and content analysis using Nvivo.

3.2 Exploratory Case Study

The Ktunaxa Nation Network was selected as the case because of its similarities and differences to other Aboriginal ICT networks in Canada. The KNN is similar to other Aboriginal ICT networks in Canada in that it was funded by both government and private sources were required to provide a business plan, had multiple project partners, and aimed to provide internet services, computer skills, and training programs for local

residents. The KNN is different to other Aboriginal ICT networks in Canada in numerous ways. For example, the physical equipment that enables an internet connection in the home was included in the initial infrastructure plan and provided to residents free of charge (the cost of this equipment has been seen as a barrier to access in other communities). The uses of this network have not yet been recorded and may enable future comparisons of community ICT networks in Canada and internationally.

The case study explored the Ktunaxa Nation network implementation and uses at the level of both the community member and the organization. An intrinsic case study is appropriate when seeking to better understand a particular case (Stake, 1994). The case was defined as consisting of four Ktunaxa Nation communities in Canada, and excluded the fifth Canadian community (the Shuswap Band) that did not participate in the network project and is reported to be separating from the Ktunaxa to form a different yet to be determined political entity (Maki, 2009). Yin (2003) states “the case study method allows investigators to retain the holistic and meaningful characteristics of real-life events.” This type of study was appropriate in this case as there is minimal research on this topic in the Ktunaxa communities and the information gathered may provide a useful foundation for future work. Selltiz et al. (1976) state that “in exploratory studies, planning of the analysis in advance is not always possible or even desirable, new ideas occur to investigators as they examine their preliminary findings” (Selltiz et al. 1976: 109).

Triangulation of the data was conducted (interview data, observation and field notes, document and literature review, as well as a review of conference materials) to strengthen the research findings and conclusions.

3.3 Literature Review

In order to provide background and context the literature review discusses the importance of ICTs for rural and remote communities, describes community ICT networks generally, provides a broad discussion of the use connectivity and ICTs in Canada and internationally utilizing six categories that were recurrent in the literature and that have been used to structure the discussion. The six categories include uses related to land, uses related to language, economic use, educational use, uses related to health, and social use. The literature review proceeds with a specific case description of one community ICT network, the Ktunaxa Nation network, which provides a practical example of earlier discussions.

The types of literature reviewed includes academic papers, journal articles, grey literature, government documents, non-governmental organization reports, conference proceedings, news clippings, online reports, relevant websites, research transcripts, and community literature.

3.4 Semi-Structured Interviews

The results of the literature review informed the development of the interview guide which consisted mainly of open-ended discussion questions, but also gathered additional data including, age range, gender, computer in the home, internet connection in the home, most frequent site of access, most frequent uses, and desired future uses. Interview topics were added at the discretion of the director of the Traditional Knowledge and Language sector who possesses in-depth knowledge of this topic and experience in this area. For example, participants were asked to think about uses of the network that would facilitate their work or personal use of both computers and the internet.

Youth, community access center employees, individuals in the Ktunaxa Nation involved with ICT in the areas of education, economics, health care, language, land and resource management and individuals from the Ktunaxa Nation Council were interviewed. In total sixty-five people were interviewed. Known contacts and local stakeholders were asked to identify other knowledgeable individuals as potential interviewees. The interview sessions were interactive and adaptive to enable participants to provide additional information they perceived to be important. The interview guide is attached (See Attachment 2).

The data provided by participants (excluding the 7 network narrative participants) was analysed using Nvivo. The 7 network narrative interviews were restored to create the Network Narrative which describes the experiences of individuals involved in the implementation process of the Nation Network during the implementation period. Interview data analyzed using Nvivo was coded by predetermined themes. The predetermined themes included economic uses, social uses, educational uses, health uses, uses related to land, and uses related to language.

Snowball sampling and the semi-structured interview guide were utilized for community member informants. Each community member respondent was initially identified by my primary contact or by another participant and was then asked to suggest additional participants. Key stakeholder informants, other use informants, and network narrative informants were identified using purposive sampling techniques. Key stakeholder informants were often those employed in the areas of land management or language revitalization and were primarily questioned about their work and relevant community projects. Other use participants were usually employed in areas that responded to the categories: use related health, educational use, economic use, and social use. Network narrative informants were identified by the primary contact and included individuals employed by the Nation, the Nations IT personnel, the current management company, and other with experience related to the implementation of the network. Each network narrative interview conducted provided insight that enabled more in-depth questions to

be created for the next narrative informant interview. Each population provided a different type of data.

The types of participants included youth, adults, elders, and included individuals employed by the KN council by sector (e.g. Traditional Knowledge and Language, Social, Lands and Resources, and Economic Investment), from each of the four communities. Each type of participant is thought to ensure a representation of different types of experiences.

The interview guides provided qualitative data. Open ended questions are useful in exploratory studies or situations in which the context is not defined. All interview participants were invited to enter their names in a draw for a Nintendo Wii. The Nintendo Wii, although developed as a gaming console connects to the internet and provides access to email, weather information, local and international news and web browsing. In communities where the cost of computer equipment (computer, keyboard, monitor, mouse, printer, etc.) may be prohibitive, the Nintendo Wii has been used as a low cost alternative (Thomas, 2007).

3.5 Restorying

The restorying method was employed to enable the recreation of a story (a series of events) from a variety of perspectives; creating an anecdotal, yet comprehensive

account of the experiences of study participants. Restorying has been used in educational research (Ollerenshaw and Creswell, 2002), psychology (Ridgway, 2001), women's studies (McGoldrick et al., 1989), and the study of work/business (Driscoll & McKee, 2006).

Two articles provided accounts and examples of restorying. One related to community and the second related to organizations. These two sources were used as a foundation for building the Network Narrative (see chapter four). Mandowski and Rappaport (2000) state that restorying is a method through which a researcher can draw out a story and where "stories are temporally and thematically organized descriptions of meaningful events in context" (Mandowski and Rappaport, 2000: 481). Additionally, Glover (2004) states the

"narrative process has two defining elements: an internal structure that arranges the sequence of events in temporal order, and thematic organization, an evaluative aspect of narrative that conveys the meaning the storyteller attaches to the event" (Glover, 2004: 49).

In this study, understanding the meaning participants have attached to each event described in the narrative, enables the reader to contextualize the results of this thesis providing a deeper overall understanding.

The network narrative comprises an account of a story that had not yet been told and provides a means through which to give a group of individuals a voice in accounting their experiences. The sequential ordering of events enabled each respondents account to relate to a specific time period and place relevant to the storyline. This assists the reader

of the narrative to draw lines and make connections between experiences, better understand the flow of events and also the meaning behind each event, which is only evident when understood as one comprehensive account. Understanding the relationships of individuals and organizations may not have been clear using an individual account of events. The network narrative assists readers in better understanding the lived experiences of participants which comprises a series of events or story that had been marginalized and may not have been told otherwise.

“Restorying is the process of gathering stories, analyzing them for key elements of the story (e.g., time, place, plot, and scene), and then rewriting the story to place it within a chronological sequence” (Ollerenshaw & Creswell, 2002).

The restorying method enabled the story of the network to be told based on the experiences of multiple participants in a chronological sequence, which provided context and meaning to the event taking place within the timeline. Taken individually, each account of events does not necessarily create the whole, rather once fashioned into one comprehensive and inclusive timeline the true meaning of the collection of participants' experiences was revealed.

3.6 2009 ICT Summit

The focus of attendance at the 2009 ICT Summit in Vancouver was to review sessions related to the current uses of connectivity and ICTs in Aboriginal communities in British Columbia. The sessions provided valuable insight and current information related to projects currently underway. The conference also provided an opportunity to meet with

the Director of Traditional Knowledge and Language for the Ktunaxa Nation Council in order to plan the research for this thesis.

3.7 Data Analysis

Content analysis is defined as "a research technique for the objective, systematic, and quantitative description of manifest content of communications" (Berelson, 1952). A content analysis of the interview and focus group data was conducted, identifying current uses, and insights as to additional uses indicated by the review of related projects internationally. In discussing community ICT projects in Canada, Grossman (2008) states that "a larger picture is aimed at that which identifies some consensus and understanding around the patterns, risks and advantages associated with the introduction of new technology to communities" (Grossman, 2008: 2). Interview data was transcribed, coded and categorized. Transcription was accomplished by listening to recordings of the interviews and retyping the discussion. Field notes were transcribed and utilized in Nvivo. Transcribed interviews were reviewed and from the 65 interviews, the 31 community informant interviews were analyzed using the Nvivo program and coded using the predetermined categories, seven interviews were restoried for the network narrative, and 19 key informant interviews were analyzed using the Nvivo program without predetermined categories.

3.8 Ethics

The research was governed by the Ktunaxa code of ethics for researchers (see attachment three) and sought approval from the Ktunaxa Nations Chief and Councils. The proposal was submitted to the Research Ethics Board of the University of Manitoba for approval. The collection of data did not commence prior to the approval of both the Ktunaxa Nation and the University of Manitoba. The researcher provided a summary of the project to all respondents. Each respondent was asked to sign a consent form and youth that were interviewed were asked to have the consent form signed by a parent or guardian.

3.9 Description of Study Participants

Data provided by participants in the community member informants group (N=31) were analysed using Nvivo and predetermined themes. The 'community member informants' group responded to the semi-structured interview guide that grouped types of use into the following categories: social, economic, education, health, land and resources, and language. Respondents were probed for further information regarding their uses related to land and language. Again, although the group 'community member informants' consists mainly of those that replied yes when asked whether or not they were band members, the category refers to individuals that currently reside in the community (and have for a significant period of time) and who completed semi-structured interviews.

The 'community member informant' group should not be confused with (and does not indicate) a 'band member' or someone who indicates they are officially recognized as a Ktunaxa Nation member. For example, 29 of 31 community member informants reported being band members.

The key informants group (n=13) is categorized to recognize that this interview data was obtained from individuals thought to have expert knowledge and insight as to the uses (both current and potential) of the Ktunaxa Nation Network (KNN) related to land and language. Respondents in this category reported being employed either by: KNC Lands and Resources Sector, the KNC Traditional Knowledge and Language Sector, Nupqu (Natural Resources Corporation for Ktunaxa Nation), College of the Rockies (COTR) Faculty of Aboriginal Education, or as: Translator, Ethnobotanist, Natural Resources Officer, or Director of Community and Economic Development. The data and findings reported below were provided by respondents from the key informants group.

The following is a description of the participants interviewed. First, the characteristics of the interviewees as one group are displayed. The interviewee group is then broken down into the groups used for the analysis including community member informants, key informants, other use informants and narrative informants. To view a table of interviewee characteristics please see Attachment Seven: Participant Overview Table.

Sixty-five people participated in the study, their ages ranged from 12 to over 81 years of age. The age of participants is depicted in Figure 3. Thirty-eight were female and 27 were male. The gender breakdown for the group is depicted in Figure 4.

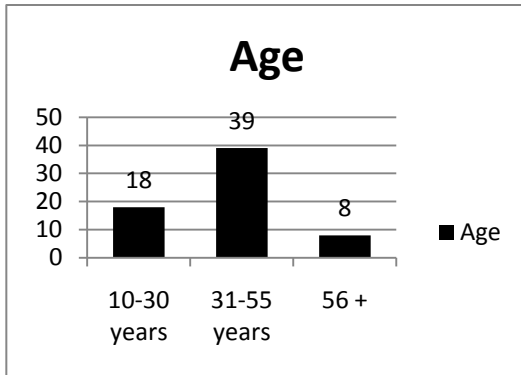


Figure 3: Participant Age

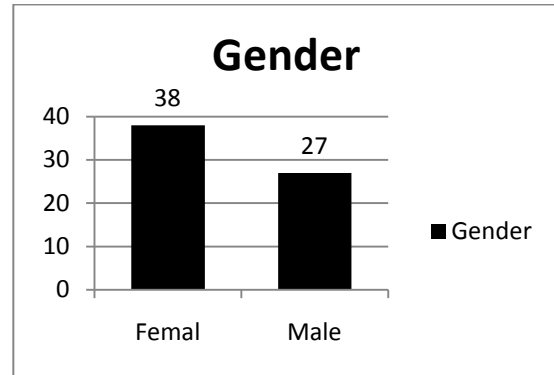


Figure 4: Participant Gender

Broad categories were created to classify areas of employment and included the Ktunaxa Nation (n=15), Provincial Government (n=7), Federal Government (n=1), St. Mary's Band (n=10), Akisqnuq First Nation (n=8), Tobacco Plains Band (n=5), Lower Kootenay Band (n=4), Nupqu Development Corporation (n=3), retired (n=1), student (n=3), not in workforce (n=1), and other (n=7), as shown in Figure 5.

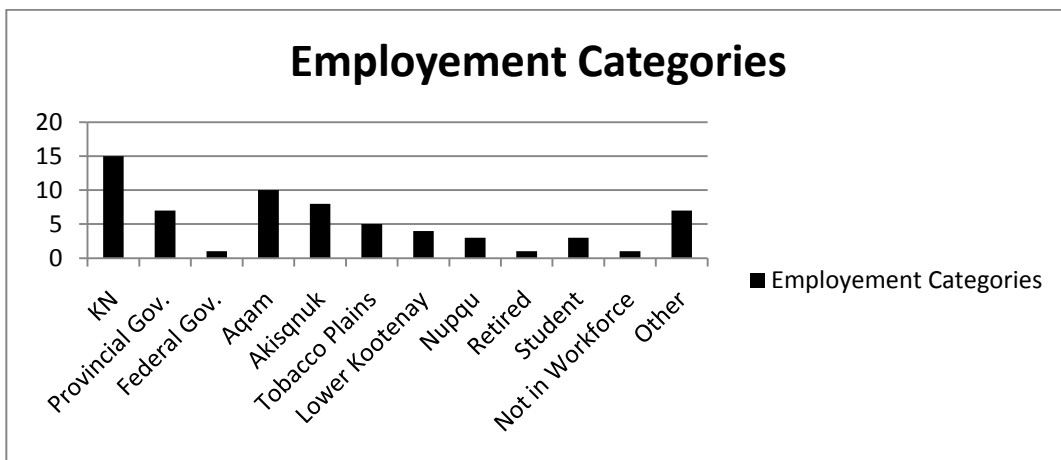


Figure 5: Categories of Participant Employment

The interviews were divided into groups for analysis including Community Members (n=30/31), Key Informants (n=13), Narrative Informants (n=7), and Other Use Informants (n=15). The breakdown of the group into interview type is shown in Figure 6.

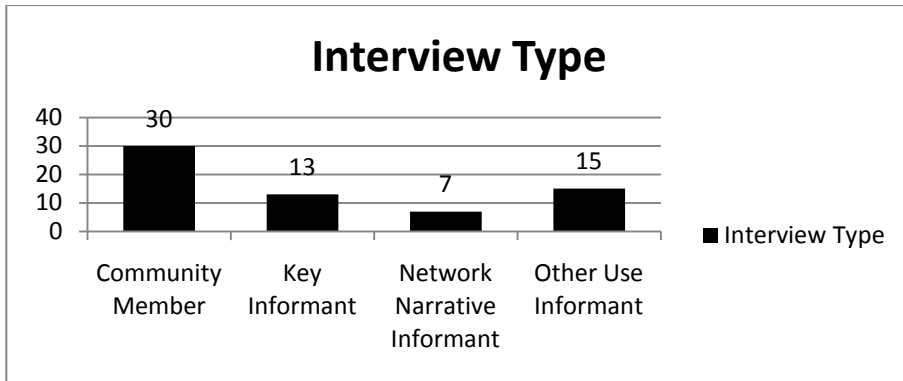


Figure 6: Participants by Interview Type

Community Member Informants (n= 31) included 22 females and 9 males, as shown in Figure 7. Nine participants were 10-30 years of age, 19 were 31-55 years of age, and 3 were 56 or older. The breakdown of community member age is shown in figure 8.

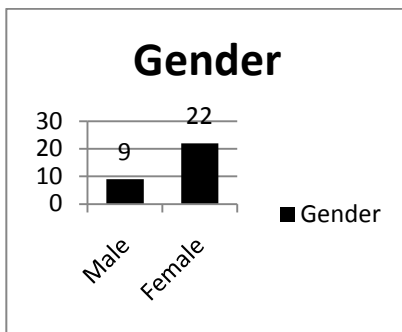


Figure 7: Community Member Informants Gender

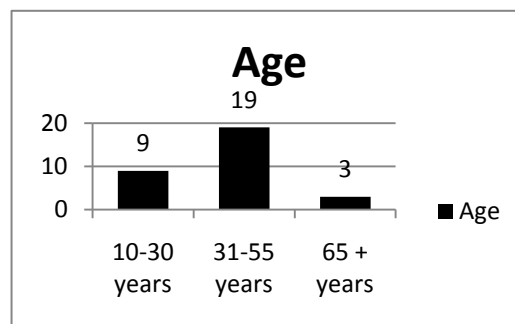


Figure 8: Community Member Informants Age

All Community Member Informants reported that they were community members except for two individuals who expressed they had both lived in their current community in excess of 20 years.

Key Informants (n= 13) included nine males and four females, as depicted in Figure 9.

Three participants were 10-30 years of age, nine were 31-55 years of age, and one was 56 years of age or older. The breakdown of key informants age is shown in Figure 10.

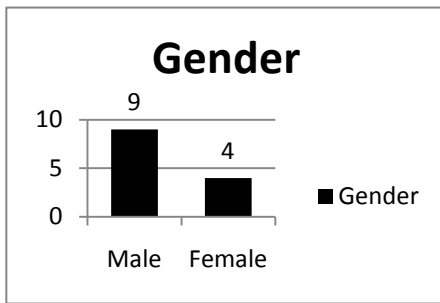


Figure 9: Key Informants Gender

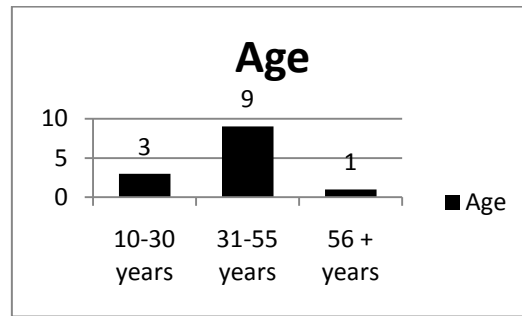


Figure 10: Key Informants Age

Key Informants included five participants that reported being community members and 8 that reported being non-community members.

Network Narrative Informants (n=7) included three females and four males, as shown in Figure 11. One participant was 10-30 years old, five were 31-55 years old, and one was over 56 years of age. Figure 12 depicts the collective ages of narrative informants.

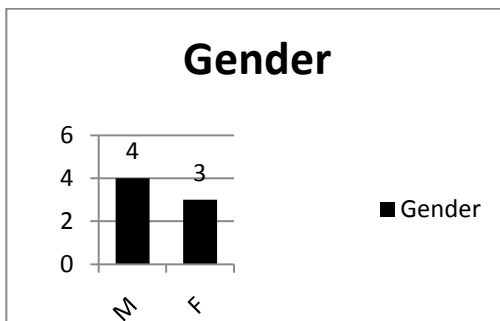


Figure 11: Network Narrative Informants Gender

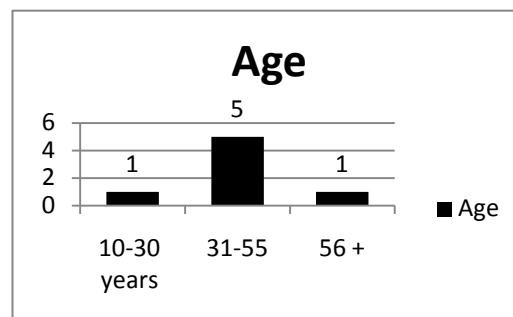


Figure 12: Network Narrative Informants Age

Other Use Informants (n= 15) included five males and 10 females as depicted in Figure 13. Five participants were 10-30 years of age, seven were 31-55 years of age, and three were 65 years of age or older. Figure 14 shows the age breakdown for other use informants.

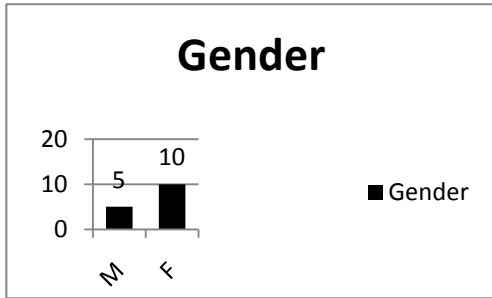


Figure 13: Other Use Informants Gender

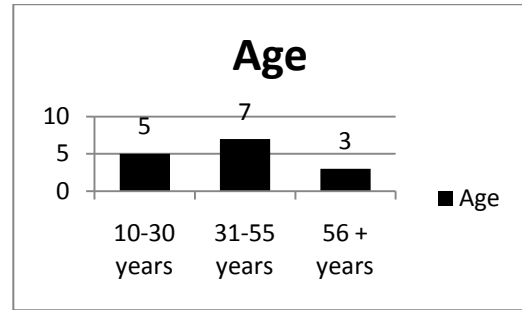


Figure 14: Other Use Informants Age

Of all study participants forty-five reported they were band members, 20 reported they were not (as shown in Figure 15), 54 participants reported having a computer at home, seven reported not having a computer at home, 49 participants reported an internet connection in their home, and 12 reported not having an internet connection in their home, as depicted in Figure 16.

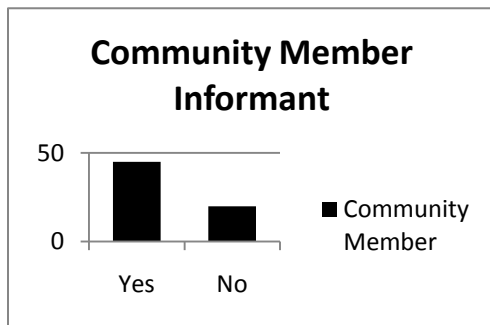


Figure 15: Community Member Status (all participants)

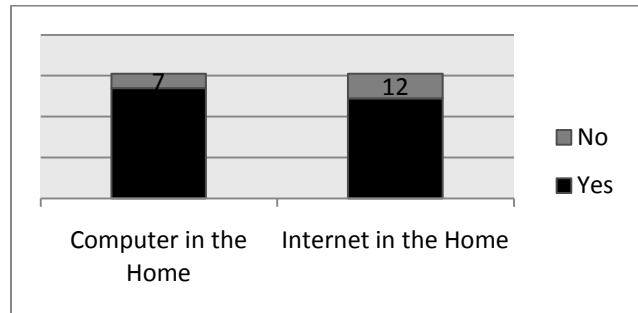


Figure 16: Computer/Internet in the Home Status (all participants)

3.10 Descriptive Characteristics

The following describes characteristics such as internet provider, computer/internet in the home and community member, for each group by interview type. Of individuals that reported having internet in their home, 11 reported having a connection provided by Telus, 15 reported a Shaw connection, and 11 reported being connected to the Ktunaxa Nation Network, as depicted in Figure 17.

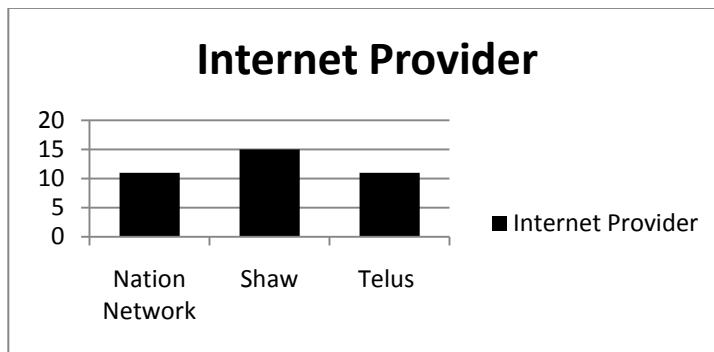


Figure 17: Internet Service Provider - Participants that Reported having Internet at Home

Community Member Informants: Twenty-five Community Member Informants reported a computer in the home, while six reported no computer in the home, and 22 Community Member Informants reported an internet connection in the home, while nine reporting no internet connection in the home, as shown in Figure 18.

Key Informants (n=19) Nine participants reported having both the internet and a computer at home, three participants did not respond to this question, and one participant had a computer at home, but not an internet connection, as depicted in Figure 19.

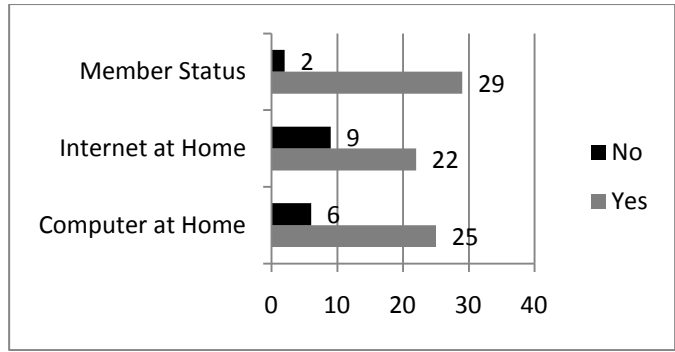


Figure 18: Community Member Informants Member Status and Internet/Computer at Home Status.

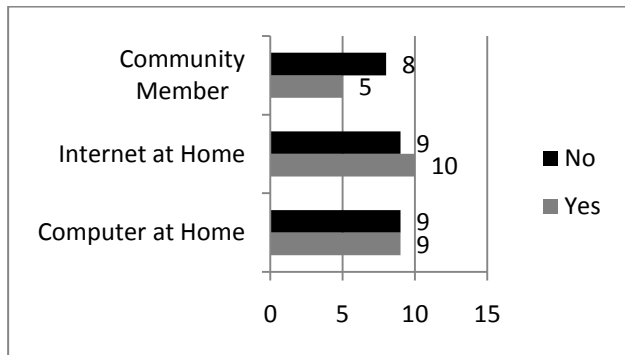


Figure 19: Key Informants Member Status and Internet/Computer at Home Status.

Network narrative informants (n=7) included four band members, and three non-band members, while all had a computer and internet connection in their home, as shown in Figure 20.

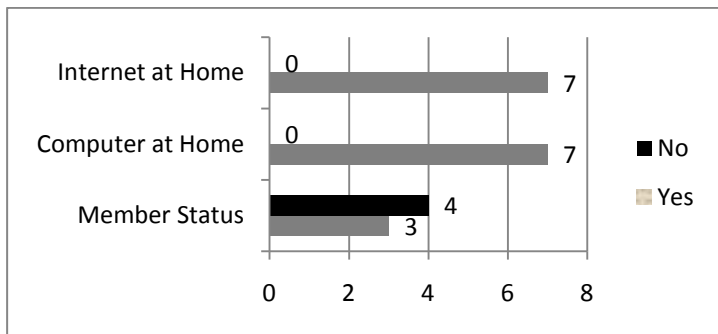


Figure 20: Network Narrative Informants Member Status and Computer/Internet at Home Status.

Other Use Informants (n=15) Of the 15 Other Use Informants nine reported they were band members and six reported they were non-band members. Thirteen Other Use Informants reported having both a computer and internet connection at home. One participant reported a computer at home without an internet connection, and another participant reported no computer and no internet connection at home. Each characteristic described is shown in Figure 21.

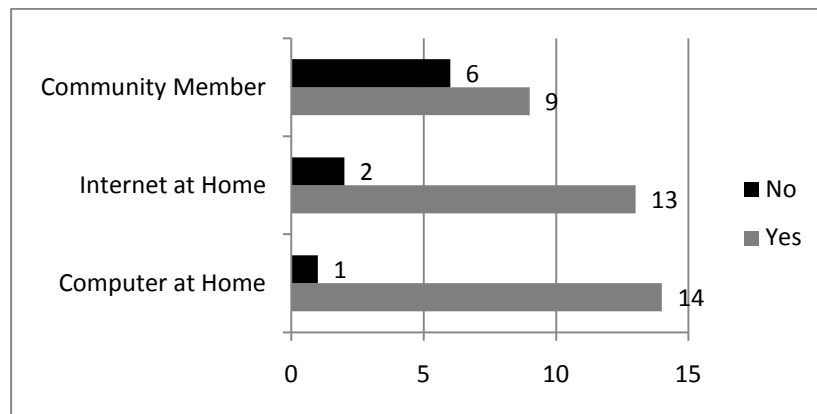


Figure 21: Other Use Informant Member Status and Internet/Computer at Home Status.

3.11 Limitations of the Study

The Network Narrative provided insight and contextual information necessary to have a deeper understanding of the results. However, the information presented using the restorying method does not include all perspectives represented during network implementation. For example, individuals or current representatives of the WCOM board were not interviewed and consequently their perspective has not been included in the Network Narrative. Additionally, the sole source of information utilized was interviews and secondary data was not available. The researcher was not present during

the network implementation and does not have firsthand knowledge of the events presented in the narrative.

A further limitation relates to the use of snowball sampling, which is generally a useful method of finding study participants but does not lead to a representative sample. Consequently the results described in this thesis are accurate for those surveyed.

Lastly, the interview guide was structured (prescribed categories of use that emerged from the literature review) in a way that requested specific data from participants. Had each participant been asked simply to describe different areas of use (related to connectivity and ICTs) the study results may have been more limited. For example, many participants may not have thought of health or land management as an area in which connectivity and ICTs are utilized but affirmed their use when questioned during the semi-structured interview.

CHAPTER FOUR - The Network Narrative

4.1 Rationale for the network narrative

The following Network Narrative provides a description of contextual information including the key players involved in the Ktunaxa Nation Network (KNN) project, the setting in which the project took place and the political climate that existed at Nation, Municipal, Provincial and Federal levels of government. Understanding the events surrounding network implementation places the results of this thesis in a more meaningful light. The findings presented in chapter five should be considered within the context of the larger story of the KNN.

The ability of local people to utilize the KNN was affected by the events surrounding the implementation of the KNN. The network narrative serves as an account of the experiences of individuals during that time. The experiences and events are presented here as described by key individuals associated with the Ktunaxa Nation who were knowledgeable regarding the KNN project and who have been employed by the Nation for an extended period of time. Understanding the context and history of the KNN plays an important role in considering the findings of this study and is necessary for appropriate interpretation of the data collected from community members, key informants and other use informants. Other individuals discussed as key players in the narrative were not interviewed for the purpose of this thesis. Names of individuals and

organizations involved in the implementation of the KNN who were not interviewed have been changed to protect their anonymity.

4.2 Background: Restorying the Ktunaxa Nation Network (Players, Setting, and Political Context)

This account of the KNN project is based on interviews conducted in the summer of 2009, a case study conducted in 2007 (Mignone et al., 2008), the public websites of those involved in the project (e.g. WCOM, NetworkBC, Ktunaxa Nation), and represents the experiences of individuals involved with the Ktunaxa Nation. The events and experiences that follow have been ‘restoried’ chronologically and presented in sequence to enable the expression of one comprehensive storyline. The key players in the KNN project include the Ktunaxa Nation, the Western Cooperative Open Network (WCOM), the Regional District (RD), NetworkBC (a provincial project body), and Industry Canada (a department of the Government of Canada).

The Players

The Ktunaxa Nation’s Director of Traditional Knowledge and Language, Don Maki, began the process of obtaining connectivity for the Nation when he applied for a grant from Industry Canada to partially fund the KNN.

Western Communications (WCOM) is a not-for-profit corporation mandated to find creative ways to work with infrastructure providers, communities, funding sources, and service providers in order to provide internet connectivity in the Kootenay's by raising private enterprise interest in building open-access connectivity infrastructure or by providing the infrastructure themselves. WCOM is funded by the Columbia Basin Trust which is an organization that was established in 1995 to promote social, economic and environmental well-being in the Canadian portion of the Columbia River Basin. The Columbia Basin Trust has different sources of funding including a yearly amount of two million dollars from the BC provincial government and other provincial sums for the remuneration of past flooding in the area (Columbia Basin Trust, 2008). WCOM, incorporated in 2001, is located in the Columbia Basin region of south eastern British Columbia and was created to operate as a member-driven organization whose membership consisted of local villages, cities, districts, a regional trust, a Regional Science and Technology Association, and a Tribal council representing four historic tribes (Stockholm, 2005). Thomas Lawson was the CEO of WCOM during the implementation of the KNN.

The Regional District (RD) is

“one of 28 regional districts formed by the Province of British Columbia to provide local government services to unincorporated areas. Most of BC's territory consists of rural areas outside municipal boundaries. Regional districts provide rural residents with an effective form of local government while also representing municipal residents on regional issues” (Regional District, 2009).

RD is comprised of mayors in the East Kootenay area. Shaun Reimer was the Mayor of a town called Smithville during the implementation of the KNN.

NetworkBC is a “provincial body [that] provides leadership and support for strategic use of telecommunications in British Columbia. Currently, Bridging the Digital Divide in rural and remote areas is a key focus” (NetworkBC, 2005). Part of NetworkBC’s mandate is to assist “First Nations with their goal of connecting all 203 First Nations in B.C. as part of a shared vision to improve the quality of life for Aboriginal citizens” (NetworkBC, 2005). John Webb, the Director of NetworkBC, spearheaded the process of connecting First Nation communities in the early days of this initiative. Webb passed away in 2007 and was replaced by Daniel Dean.

Industry Canada’s Broadband for Rural and Northern Development (BRAND) program began as a pilot program in 2002 and aimed to bring connectivity and broadband services to communities that currently did not have adequate internet connectivity. Priority was to be given to First Nations and Northern communities (Industry Canada, 2005).

“British Columbia is home to one third of Canada’s First Nations communities. The First Nation’s communities in British Columbia are for the most part located in remote and isolated regions of the province and tend to be comprised of relatively small, geographically scattered communities that have an average population size between 100 and 300 people” (Mignone et al., 2008).

This program provided partial funding for broadband projects and continues to offer funding for connectivity projects. A list of the parties and organizations involved in this narrative is provided at the end of this chapter.

The Setting

The Ktunaxa Nation consists of four communities spread over a mountainous area. Prior to the KNN project the communities had access to dial-up internet in their administrative offices only. The area is sparsely populated and the costs of building broadband infrastructure in the area were prohibitively high due to the large project area and the mountainous terrain. These two conditions serve to undermine the usual foundation of a profitable business case for connectivity and, consequently, private enterprises had not previously been interested in providing internet services in this area.

In 2005, the province of British Columbia entered into an agreement with Telus, a major telecommunications provider, which essentially gave Telus a monopoly contract for government services provided Telus would allow access to their backbone infrastructure to small community Internet Service Providers (ISPs). The provision of access along with a publicly funded project grant was the factor that enabled a business case to be created for many small projects in rural BC. Providing improved access to government services in rural, remote First Nations communities was at this time a priority of both the federal and provincial governments.

The Political Context

The players involved the KNN project included WCOM board members and represented a variety of government levels and organizations. The Ktunaxa Nation brought the largest amount of funding, three million eight hundred thousand dollars, to the table as result of a grant awarded by Industry Canada via the Broadband for Rural and Northern Development program (BRAND) to connect the Ktunaxa communities and to contribute to WCOM's mandate of bringing connectivity to the east and west Kootenay area.

Understanding the legal agreement between the Province (NetworkBC), Telus, the Ktunaxa Nation, and WCOM is essential in considering the complexities of the KNN's establishment. WCOM was the entity that was given access, by the Province, to the Regional Network Centers (RNC's) that housed the province's connectivity equipment and infrastructure. Telus is the service provider for the province. The agreement between WCOM and NetworkBC (the Province) was facilitated by an agreement that took place in 2001 when British Columbia began to bridge the digital divide. NetworkBC was created in 2005 to identify communities that were eligible to receive broadband connectivity. NetworkBC was created as a provincial project body on the recommendation of the Premier's Technology Council. At this time, the council recommended that one way to address the digital divide without drawing on additional funding from the Province would be by building on infrastructure currently in place to extend the network.

“Prior to 2001 access to the internet was available in some rural areas. However, the technology was seldom utilized as a result of the long wait time inherent with dial-up network connections” (Mignone et al., 2008).

To enhance the current network, the Shared Provincial Access Network, the council amalgamated the demand of the current network with the demand of the provincial health authorities and Crown corporations to use their collective purchasing power “to motivate telecommunications suppliers to upgrade their networks to provide high speed connectivity to provincial communities” (NetworkBC, 2005).

“A contract for supplying these agencies collectively with telecommunications services was awarded to TELUS, giving TELUS a virtual monopoly on telecommunication services provided to the provincial government. It was estimated that the province along with other agencies would spend approximately \$245 million for telecommunication services over the next four years. Generally, a contract of this size would not be awarded to a single company in order to avoid the creation of a monopoly” (Mignone et al. 2008).

Concurrently, the Province was preparing to update their own connectivity infrastructure to facilitate larger data transmissions and other features. The costs of the upgrade would be incurred to improve connectivity between government agencies.

“By coupling this project with the proposed extension of backbone infrastructure across the province the government was able to leverage their spending power to create an overall savings and establish the infrastructure to connect rural, northern and Aboriginal communities” (Mignone et al., 2008).

In 2001 the Province of British Columbia committed to bridging the digital divide and formed a relationship with Telus that would benefit BC communities by providing select access to backbone infrastructure (NetworkBC, 2005).

WCOM was the project manager for the KNN project and also for other connectivity projects in the East and West Kootenay’s (located in south eastern British Columbia).

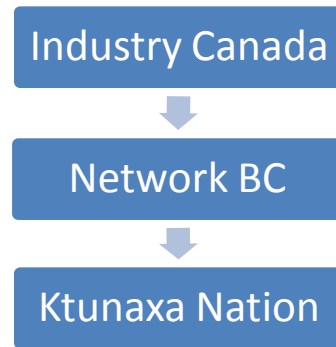
The agreement between WCOM and NetworkBC (Province of British Columbia) naturally involved Telus as the owner of connectivity infrastructure already in place. Projects such as the KNN project were given permission to utilize portions of the Government's infrastructure, which is serviced by Telus. Consequently, the equipment in the RNC's belongs to Telus, but is used to provide services to government agencies across the Province and more specifically in the local area. Prior to this project, the Province of British Columbia had never allowed another entity access to the RNC's. One can infer that the provincial government would generally not want parties with private or vested interests to access their connectivity infrastructure, potentially affecting government operations and privacy laws. One stipulation of the agreement to provide WCOM with access to the RNC's was that WCOM had to own any equipment installed in the RNC's (Maki, 2009).

If access to the RNC's had not been provided, smaller community and regional networks would not be economically feasible due to a lack of economies of scale in the area (Mignone & Henley, 2009). WCOM's mandate was to bring connectivity to the unserved and underserved (Maki, 2009). More information on the agreement between Telus and the Province can be found at www.networkbc.com. Understanding the flow of project funding and stakeholder relationships is essential to the overall understanding of the project.

Box3: Flow of Funding Description

Funding for Community ICT Network Project flows from Industry Canada (Federal Level) to NetworkBC (Provincial level) and then to the Ktunaxa Nation, who must then contract other companies to establish the Network. The flow of funding is depicted in Figure 22.

Figure 22: Illustration of the Flow of Funding.



Box 4: Stakeholder Relationships

The chart on the right shows how each stakeholder relates to the other. The WCOM board is the management company of whom both the Ktunaxa Nation and RD are customers that have contracted WCOM to install internet infrastructure. NetworkBC is a facilitator between WCOM and engaged parties. The relationships are depicted in Figure 23.

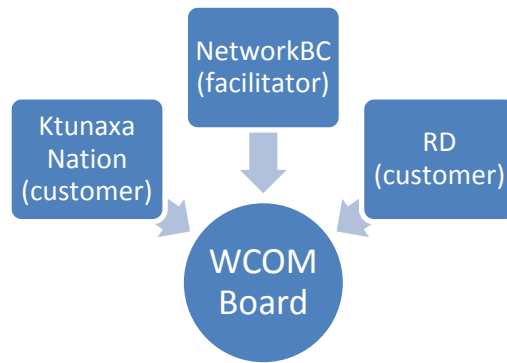


Figure 23: Relationships between Management Company, Facilitator, and Community.

4.3 The Original Vision for the Network Project

The story of the KNN begins in section 2.3 which describes the initial intent of the network; language revitalization, connecting communities, and current projects designed to be facilitated by the KNN, including First Voices and Ktunaxa I Remember (Ktunaxamemories.ca).

Mignone et al. (2008) reported on the objectives of the KNN and stated that “the network was initially conceived by the traditional knowledge and language sector as a means through which to disseminate the disappearing Ktunaxa language” (p. 21). Today there are 24 fluent speakers of the Ktunaxa language which is a cultural isolate (has no linguistic affiliation to any other language today or historically) and is not similar to any other language in the world (Maki, 2009). For most, travelling to a central location entails driving for two to four hours, those who are fluent are elderly and unable to travel out to each community and hearing the language is considered a necessity for language transmission (Maki, 2009). The Ktunaxa communities are spread over a large mountainous area making the use of online language programs the most effective method of language dissemination (Beatie-Laine, 2009). Prior to the introduction of the KNN project, connectivity was limited to dial-up. The capacity of a dial-up connection (56K) was not sufficient for the delivery of online language programs (Maki, 2009).

The Ktunaxa Nation has been recording their language for decades in different capacities and have an extensive archive. This task included the use of a tape recorder in community meetings to record the elders speaking their native tongue during storytelling (Mignone & Henley, 2009). “In 2001 funds were secured through the First Peoples Cultural Foundation to begin to digitize all of the previously recorded material from the past twenty years”, following which the dissemination of language using the

“digital archives was to be made possible with the introduction of broadband connectivity” (Mignone et al., 2008).

Around the same time, Don Maki, the Director of Traditional Knowledge and Language, applied to Industry Canada’s BRAND program which was awarding federal funding to selected applicants who were able to submit a business case for a self-sustaining internet network. Three million eight hundred thousand dollars of federal funding was awarded to the Ktunaxa Nation contingent upon the submission of a feasible business plan which proved difficult due to the small population and mountainous terrain (Mignone et al., 2008).

The total project contract was for seven million six hundred thousand dollars and of that three million eight hundred thousand dollars was in-kind. The in-kind funding included the use of the Regional District (RD) two million three hundred thousand dollar broadband infrastructure. WCOM was mandated to provide connectivity in the East and West Kootenay’s of British Columbia and was selected as the project manager for the KNN project. Players on the WCOM board included the RD, the Ktunaxa First Nation, and representatives from other local communities. The Ktunaxa Nation was able to make an in-kind contribution in access to infrastructure as the result of the funding awarded by Industry Canada which made the Nation the major funder for the regional build (Maki, 2009). The RD contributed infrastructure established via funding from the Municipal Finance Act (MFA) which was borrowed on behalf of the citizens of the region. The

regional district's backbone infrastructure was a fibre build from Spillimacheen down to Spirits Reach, and from Riverbend to Panorama (Maki, 2009).

The broadband project has been the foundation of various other ventures for the Nation. The Ktunaxa Nation was selected as the community network for the Fully Integrated Technological (FIT) community program and will document their experiences in order to provide a successful model and best practices for other communities to follow (Maki, 2009). In order to provide the necessary IT skills to individuals in the Ktunaxa communities, select individuals traveled to Alert Bay, BC to participate in training workshops that focused on the maintenance of technical equipment that provides high speed internet and support for broadband applications. "The workshops consisted of three weeks of 'A plus' computer technician training, two weeks of hands-on training in Alert Bay followed by five months of online instruction" (Mignone et al., 2008).

Additional project funding was obtained from the Canadian Institutes of Health Research (CIHR) in partnership with the University of British Columbia's (UBCs) Continuing Medical Education Branch. The objective of UBCs project was to connect elder's health and youth knowledge by establishing learning centers in each community and websites that promoted the discussion of health issues. The project also provided information about health issues identified by community members as important and relevant. The community learning centers (CLCs) are public access sites where individuals can access

computers and internet free of charge (Maki, 2009). Another project enabled by the KNN and supported by the Canadian Heritage Gateway fund focused on the creation of a Traditional Language and Cultural Web Portal called “Ktunaxa: I Remember” that assists with the dissemination of the Ktunaxa language and culture.

The KNN project has fully utilized the First Voices website and initiative. First Voices “is a suite of web-based tools and services designed to support Aboriginal people engaged in language archiving, language teaching, and cultural revitalization” (First People's Cultural Foundation, 2003). The First Voices website was created in 2003 to archive and document Indigenous languages using text, sound, pictures and video and includes educational tools including online interactive language games (First People's Cultural Foundation, 2003). Today the Ktunaxa have one of the largest database archives on the First Voices system (Maki, 2009).

4.4 Issues and Problems as Reported by Key Respondents

The KNN was conceived as a means through which to disseminate language throughout the four communities via the use of broadband internet and online language programming. This goal has essentially been met, however significant delays in project milestones were the result of difficult inter-organization relationships and a delayed infrastructure build (Maki, 2009). Further, as a result of these delays and other infrastructure design issues not all residential homes have been connected. An internet

access point or hub has been established in every community in or near the band office. Nonetheless, residential connectivity varies by community. The goal of connecting all 500 community homes is expected to be met in the near future.

The KNN was officially launched March 21st of 2007 and an event marked by a public ceremony that was held at the Lower Kootenay Band, one of the Ktunaxa communities. Suspensions had been mounting prior to the official launch and after this point it became clear the infrastructure required for the broadband network was not functioning.

“This has been an ongoing saga for us, it has been something that we’ve been more troubled by when we were told that our network was done, I mean we held a very public event at one of our communities that was sort of the equivalent of a ribbon-cutting ceremony, you know to say ‘ta-da’!, and then to find out that many of the things we were told were in place weren’t. We began to find out on a piecemeal basis that specific components of our network simply were not there, were missing” (Teneese, 2009).

Consequently, community members were unable to utilize the KNN as planned and band administration offices were often hampered in their day to day operations.

“When it actually came to putting the network together in operationalizing it, there was disharmony within the WCOM piece and we found out that our interests weren’t being well served and that there was a lack of consultation” (Armstrong, 2009).

The implementation of the KNN took place over two years. The original WCOM project, which began prior to the KNN project, involved the municipalities, schools, colleges and the Province of BC as stakeholder groups. During that time, Shaun Reimer, the Mayor of Smithville, member of the RD, and also a board member of WCOM proposed to borrow

additional funds from the Municipal Finance Act (MFA) to develop fibre to the home in Smithville. (Partial funding had previously been borrowed from the MFA to contribute to the RDs infrastructure build). The Smithville network would be called Nanofibre. A referendum was held for citizens to vote and voice their opinions on the matter, but the motion was not upheld; the people voted against the idea. However the Mayor decided to proceed with the project and obtained financial backing from private investors.

The infrastructure build for the KNN project was underway at the time of the referendum and included towers in the same regional area, including the town of Smithville, as the proposed Nanofibre network (which was not connected at the time but was proposed to be the site of the Nanofibre network that would include both fibre and towers). The KNN towers slated to be built (bought and paid for), had the potential to provide connectivity to homes in Smithville. WCOMs CEO and project manager who was the developer for the KNN infrastructure (responsible for building the KNN towers) was unable to explain why the KNN towers were not working once the build was complete (Maki, 2009). At this time the Ktunaxa owned 14 towers in the region that did not work (e.g. Lawson had installed the towers but the towers did not function). Without functional connectivity the Ktunaxa Nation was unable to advertise the internet service they had hoped to provide.

Once the financial backing was in place the infrastructure build for Nanofibre began.

Maki (2009) reported that at this time he noticed that the KNN project build slowed to a

halt and that Thomas Lawson, the project manager for the KNN project became unreachable. Maki (2009) stated that Lawson was also the project manager for the Nanofibre project and that materials purchased for the KNN infrastructure disappeared around the same time as the Nanofibre build.

Both the Ktunaxa Nation and the RD had purchased materials for their infrastructure builds that included rolls of fibre at a cost of approximately 20-30 thousand dollars per roll. Each roll of fibre was stamped with the name of the purchaser and housed in a public works yard. During an inventory check conducted for the Ktunaxa Nation, it was recorded that two rolls of fibre were marked with the name Don Maki, Ktunaxa Nation and 14 rolls were labelled RD were located in the public works yard. A short time later all 16 rolls of fibre disappeared except for one collected the previous day (Maki, 2009).

Ktunaxa requested they be compensated for their two rolls and questioned whether or not the RD was being compensated for their 14 rolls that had been taken from the public works yard. In April of 2008, the issue was readdressed at a meeting held with the RD Mayors and the Ktunaxa Nation at the St. Eugene mission. When questioned about the 14 rolls of fibre, the RD refused to acknowledge that any of their fibre had disappeared or could not be located. Later, it was discovered that the RD had not been compensated for the 14 rolls of fibre and had chosen to sue WCOM for compensation. One connection between the KNN build and the RD build is that the fibre for each project was located in the same public utility yard. A second connection between these two projects is Lawson,

who was the CEO of WCOM and a member of the RD and was consequently involved in both builds (Maki, 2009; Armstrong, 2009).

The total worth of the missing fibre was approximately \$280,000 (Maki, 2009). In December of 2007, an assessment of the inventory for the KNN project was undertaken on behalf of WCOM. The individual that performed the assessment was a WCOM employee. The individual that took the inventory reported back to the board and indicated that there were problems, specifically problems with inventory missing and problems related to Lawson. After reporting these problems the individual was fired by the WCOM board (Maki, 2009).

In detailing the climate between WCOM and the Ktunaxa Nation near the end of the KNN infrastructure build, Maki (2009) explained that WCOM had not yet fulfilled their mandate to connect unserved and underserved communities in the East and West Kootenay's. Maki discussed that he approached Jason Richie, WCOM board member, numerous times to discuss the delayed infrastructure build, to begin discussions for WCOM to contact potential ISPs for the KNN, and to move forward the with business plan for their network. These tasks were the responsibility of WCOM under the Industry Canada contract. Richie replied that WCOM was not interested in contacting ISPs or proceeding with the business plan for the KNN project (Maki, 2009).

The conversation between Maki and Richie seemed to indicate that WCOM was not interested in supporting First Nations connectivity, which was the foundation for the major portion of the funding providing infrastructure in the region. At this point Maki (2009), the representative from the Ktunaxa Nation resigned from the WCOM board. Maki stated that “if the Ktunaxa Nation Network had been completed and functional as planned, a First Nation would have been able to provide high speed internet connectivity to the whole region.” After Maki resigned from the WCOM board, Helder Pointe, the Economic Sector Director, took over representation for the Ktunaxa Nation on the WCOM board (Maki, 2009).

In January of 2007, Lawson refused to build five towers for the Ktunaxa Nation, stating that they were not needed now that the regional fibre build was complete (Maki, 2009). The five towers in question were a requirement of the contract between the Ktunaxa Nation and Industry Canada. Once this was made clear, Lawson completed the build and five towers were in place by approximately the middle of February of 2007. Initially the KNN build was to be completed by November of 2006, at that time WCOM had not finished the build and an extension was granted by Industry Canada. In February of 2007, Lawson reported to Maki that the KNN was completed and functional. The KNN launch ceremony took place in March of 2007.

In the beginning, the relationships formed between individuals representing different entities on the board of WCOM were positive and members felt the project had great

potential. However, by January of 2007, it became evident to Maki and others involved in the project that many things were going wrong with the Ktunaxa build. Equipment was functioning poorly or not at all and the infrastructure build was behind schedule and showed no signs of progress (Maki, 2009). In response, a monitoring of the KNN project was conducted with an Industry Canada representative. The monitoring was a spectrum analysis in which a technician assesses the tower radios for connectivity to ensure the network is functioning properly before the final sign off on the project (Maki, 2009).

“A spectrum analyzer can be used to determine whether or not a [wireless](#) transmitter is working according to federally defined standards for purity of emissions. Output signals at frequencies other than the intended communications frequency appear as vertical lines (pips) on the display. A spectrum analyzer can also be used to determine, by direct observation, the [bandwidth](#) of a [digital](#) or [analog](#) signal” (TechTarget, 2010).

During the monitoring Maki (Ktunaxa), Cindy Jeromin (Industry Canada), and Lawson were present. Maki (2009) states that during the visits to the communities to complete random checks for connectivity Lawson was continuously using his cell phone causing the towers to appear to be functional to the technician, when in reality they were not functional. In reality, Maki reported, the towers did not function the day before the monitoring or on the day after.

Following the site visits, the spectrum technician, Jeromin, Maki and Lawson had a meeting. Maki reported that during the meeting Jeromin (Industry Canada) informed the group that the radios installed on the towers were unlicensed and uncertified, and consequently were illegal. Jeromin also stated that although they were not able to prove

it, they knew that this whole tour was contrived but would give WCOM another two weeks to get everything working (Maki, 2009).

Later that month there was an unofficial meeting between Maki (Ktunaxa Nation), Dean (Executive Director of NetworkBC), and Jeromin (Industry Canada). During this meeting Maki explained the inconsistencies and issues that were taking place in relation to WCOM and suggested that the KNN project may have to continue without WCOM as the project manager. Maki discovered that a legal contract existed between WCOM and NetworkBC which stated that only one entity, WCOM, was legally allowed to access the RNC's and that the only equipment to be housed in the RNC's was to be property of WCOM. The equipment purchased by the Ktunaxa Nation was currently being housed in the Regional Network Centers (RNC's). This situation presented a legal problem for all parties involved. Through the course of this meeting, attendants discovered that NetworkBC's lawyer had repeatedly requested that WCOM provide him with the bill of materials for the equipment in the RNC's to justify their access, as was stated in their contract (Maki 2009). The lawyer stated that WCOM neglected to provide the bill of materials. The province was not interested in allowing a third party access to the RNC's. At the end of this meeting, the decision was made that no action would be taken by NetworkBC, despite the evidence that WCOM had not followed the conditions of the contract.

After having incurred extensive legal fees and court costs to later determine that the equipment purchased by the Ktunaxa Nation did in fact belong to the Ktunaxa Nation (courts ruled in their favour), the inventory sheets that indicated where their equipment had been installed and where it was currently located was incorrect. In other words, even though the equipment was determined to legally belong to the Ktunaxa, the equipment could not be physically located to be repossessed. The Ktunaxa Nation spent six months applying for additional funding to complete the KNN project build and was successful. Additional funding was obtained through NetworkBC in order to redesign the KNN. Once the issue of ownership was successfully settled the Nation was in the position of trying to put together a second operational business plan that took into account the losses incurred to date.

To recap, the Ktunaxa project was scheduled in the Industry Canada BRAND project timeline to be completed by November of 2006. At that time WCOM had not finished the infrastructure build and an extension was granted. Industry Canada's BRAND program was coming to an end in March of 2007 and according to study participants Industry Canada was not interested in dealing with any continuing issues surrounding the project. By January of 2007, relationships between the Ktunaxa Nation, WCOM, and between NetworkBC and WCOM had broken down. WCOM and Network BC was not allowing the Ktunaxa Nation access to the equipment in the RNC's until the question of ownership had been legally addressed. During the summer of 2007, Daniel Dean became involved on behalf of NetworkBC to address the situation.

Individuals involved directly in this situation felt that political alliances amongst the East Kootenay mayors had played a major role in the way events unfolded. The RD is a board comprised of elected members that dealt with local and regional issues. Shaun Reimer, the Mayor of Smithville and owner of Nanofibre was a member of this board. Many participants described this board as an 'old boys' club after their experiences related to the KNN project. The sentiment among participants was that the members of the RD actively worked to support their own interests including the interests of Mayor Reimer at the expense of the KNN project.

Participant 63, a Ktunaxa member of the Akisqnuq First Nation, was elected to the RD as a regional director during the time Reimer was the chair. While the board deals with numerous issues, one that held significance for Participant 63 was the KNN project. Participant 63 reported that she was uncomfortable with the conflict of interest Mayor Reimer presented; he was a board member of WCOM, the chair of RD, the Mayor of Smithville and was building his own network (NanoFibre) in Smithville. After attending several meetings of the RD, Participant 63 discussed her discomfort with other board members and insisted they follow protocol.

Following protocol meant holding a vote of the RD that would have essentially "shut down Reimer's project" (Participant 63, 2009). Prior to the vote Participant 63 had discussed the issues with a number of board members of the RD and was confident a

favourable vote would result, but just slightly. However, according to Participant 63, on the day of the vote a member of the board that had not been active for some time attended the meeting and cast a vote. The vote of the additional party was enough to enable Mayor Reimer to continue with his project. Participant 63 believes the deciding vote was cast as part of a business deal between Mayor Reimer and the unexpected board member who was also the Mayor of Riverbend.

The issues raised by Participant 63 in RD meetings and the unsuccessful attempt to quash Reimer's business venture were met with severe consequences. Once Participant 63 "...started asking questions about what was going on, 'participant 63' was harassed to the point where a lawyer had to be obtained about the harassment" (Maki, 2009). The direct refusal to deal with Participant 63's concerns and the harassment experienced promoted a meeting between the Ktunaxa Nation and the RD. The meeting included Maki, Sophie Pierre (Chief of St. Mary's Band), Gwen Phillips (Ktunaxa Corporate Communications) and members of the RD. The Ktunaxa group presented concerns about the project to the RD board members who in turn refused to acknowledge the claims. The participants that described this meeting felt the board chose not to acknowledge their claims as a result of their connection to Reimer, who was the Mayor of Smithville and a member of the RD. In other words, the participants felt that the RD board members were 'standing up for their own' and did not objectively consider the issues.

WCOM was originally designed to be the central housing for connectivity projects in the area, to bring together partners and to form relationships and was considered initially in a very positive light. Ktunaxa individuals involved in the WCOM board originally expressed being excited to be involved in working together to bring connectivity to the area. The positive atmosphere of excitement was significantly diminished when WCOM (essentially WCOMs builder Lawson) choose to connect only two communities, the St. Mary's Band and Lower Kootenay Band, of the four First Nations involved in the project. Two other First Nations communities were slated to be connected to meet the Industry Canada project requirements. The Ktunaxa Nation contributed six million dollars in project funding and access to infrastructure for the region, both aspects that contribute to WCOMs mandate. The Ktunaxa project included connecting the four First Nations and in turn providing others in the area with access to connectivity infrastructure (Maki, 2009). Individuals representing the Ktunaxa Nation on the WCOM did not understand why the project was not taking place according to the original business plan.

After the public launch ceremony for the KNN in March 2007 the outcomes of the problematic infrastructure build seemed to be known by all, in some places the network was not functioning properly and in other the network was not functioning at all. NetworkBC began discussions with WCOM to remedy the situation. During this period the representative for NetworkBC was Daniel Dean. Maki (2009) reported that although Dean's main objective was to remedy the broken relationship between the Ktunaxa Nation and WCOM, individuals from the Ktunaxa Nation were not consulted with. Dean,

in attempting to remedy the situation, made promises on behalf of the First Nation without consulting them. In reflecting, Maki (2009) restates how the First Nations were left out of the process and not consulted. Later Dean attended a meeting with the Ktunaxa Chiefs to report what settlement had been reached. The Chiefs were very upset about the lack of consultation (Maki, 2009). Maki suggested one remedy in this situation was for WCOM to turn over the licences providing access to the RNC's to the Ktunaxa. This would have enabled those involved in the KNN project to access their equipment and continue to meet (or try to catch up) with their project goals. However, the provincial government would not allow this.

Maki reports learning at a later time, through conversations with Adam Hill, that Nanofibre may have been illegally using the Ktunaxa Nation network infrastructure from the beginning. Hill was contracted by Nanofibre to complete portions of their network build. According to Maki (2009), in their conversation about Nanofibre and the network Hill stated that Lawson "made me splice out points from your fibre into theirs, I know it wasn't right, but when I'm told to do something for my job, I do it" (Maki, 2009).

4.5 The Present: Broken Relationships

Even today, as Maki proceeds to build the KNN and continue with a new business plan, the activities and events that occurred during the build became more and more evident. One example of this relates to inventory sheets that state where equipment is located.

The equipment comprises a portion of infrastructure that is essential for the KNN to function. Maki has the bill of materials and bill of sales for this infrastructure but discovered during a routine site visit that the infrastructure simply is not there.

“We suspect that maybe a lot of it [infrastructure purchased for the KNN build] is in the Nanofibre build and WCOM should be accountable for it. The whole original WCOM board has resigned; now the board is comprised completely of Mayors of the RD” (Maki 2009).

Maki believes the equipment was never installed and states this has become a reoccurring theme; their infrastructure cannot be located, despite the paper work stating the equipment has been purchased and installed. Study participant 61 (2009) stated that from a leadership perspective, the Nation

“could never have imagined the amount of time Maki, the director for the Traditional Knowledge and Language sector, would have to spend on the technical aspects of it [the KNN project] as opposed to utilization [for language revitalization], never in our wildest dreams did we think that would happen. We thought because we were in partnership with WCOM that we had these people with the technical experience [to deal with the technicalities of network infrastructure implementation].”

In other words, the relationships created included WCOM as the party responsible for ensuring the technical functionality of the KNN. Others were involved (for example Maki) in order to utilize the network to meet specific goals and objectives on behalf of the Nation including, for example, online language dissemination. When it became evident to those waiting to utilize the network, that WCOM was not onside with the Ktunaxa project, there was no protocol for action or recourse. A series of events played out that were essentially uncontrollable due to the immobility of the provincial access licences (Maki, 2009).

In discussing the legalities of the project, Armstrong (2009), who is the KNCs accountant, stated that

“things with WCOM really fell apart last year over ownership issues related to the equipment... we spent a good nine months to a year with lawyers trying to prove that the infrastructure everybody was connected into was actually ours (the Ktunaxa Nations) and had been purchased with grant money awarded to the Ktunaxa Nation by the Industry Canada BRAND program.”

In discussing the string of events that had occurred, both Armstrong and Maki reported that even though they felt suspicious, or felt that something was not quite right in the initial phases of the project, they did not want believe that reputable individuals would commit such underhanded acts and thought there must be some other explanation for the series of events. Not wanting to make false accusations, the KNC members involved in the project discussed what actions could be taken if their suspicions were confirmed. Traditionally, if an individual or a company believes they have been robbed the injured party would contact the police and report the crime. Could they call the RCMP and report that individuals employed by the WCOM group were stealing their connectivity? Their infrastructure?

“The problem is that the network is virtual in that we own something that you can’t really see, feel, or touch and trying to, from my point of view, secure that asset, manage the risk on it and make sure the investment is protected is just incredibly difficult. It’s very prone to being pirated or misused by other access users that have the skills to tap into it” (Armstrong, 2009).

When Lawson, WCOMs CEO and project manager disappeared, the Nation decided that securing ownership of their assets was the top priority. Maki sought out other network managers and contacted a network management company from Ontario called Indignet. The individuals from Indignet were able to locate and transport the KNN

project's connectivity equipment out of the City of Trail and back to Cranbrook area.

Maki (2009) states there are 30 communities in the area that could have been connected if their towers had not been "built to fail", to provide Mayor Reimer with a greater potential for the success of his business Nanofibre.

Indignet was able to assist the Ktunaxa Nation to get their equipment back, install the equipment as originally proposed, and assert their ownership rights. Indignet located and transported equipment back to Cranbrook and established a fully functioning network. This process was not complete until approximately two years after the proposed launch date and as a result revenue sources were not generated during this period. "We couldn't even get a handle on what the costs of the network were, in terms of what was going on and what were potential sources of revenue" (Armstrong, 2009). Providing the Nation with additional revenue was one of the main goals set out in the original business plan for the KNN project. Armstrong (2009), states that "the KNC is a Nation level collective organization that survives strictly on government funding and funding from other agencies." Consequently, the Nation continues to carry the unforeseen costs associated with the KNN project. One example of unforeseen costs is the legal fees that were incurred to regain possession of and prove legal title to the assets and equipment purchased for the project. Today Armstrong, the Ktunaxa Nations accountant, estimates that the project losses incurred by the Nation may potentially be recovered in three to five years (Armstrong 2009).

In looking forward, the KNN goals are to initiate the business processes needed to ensure the network is a successful venture and to market the service to the Ktunaxa and surrounding communities. A local company called JSL forum will be the new network managers for the KNN. Today, the business relationships and structures necessary for the KNN to be successful are in place. Players from the KNC, the City of Cranbrook, the RKED and Nanofibre (not including ex-Mayor Shaun Reimer) are working together to use the infrastructure each party has at its disposal to provide broadband services in the local region.

4.6 The Future: JSL and FlexiNet

Jordan Eliason, the project manager at JSL Forum, describes JSL as having been in business in the Kootenay's for about 15 years. "JSL Forum's position has basically been to foster growth in technology in the East and West Kootenay's in leading edge technology" (Eliason, 2009). Eliason reported that JSL has completed a number of projects in the area including connecting offices via VoIP (Voice Over Internet Protocol) and was originally introduced to the Ktunaxa Nation when contracted to install a VoIP telephone system (this task assumes the network the VoIP system would utilize is already in place). During the course of the year long VoIP system project a positive relationship was established that later enabled discussions around JSL becoming the Nations future project manager for the KNN. The initial goal for JSL as network managers was to manage the network and users at a subscription level to "ensure the

configurations support growth” (Eliason, 2009). To date, JSL has been able to add new customers onto the network and has begun the process of taking an inventory of the entire network infrastructure. In relation to the missing infrastructure Eliason commented that

“it isn’t really missing...possibly it was never installed there, even though there are invoices for that equipment, it’s detailed in the paper from WCOM...[that] there was a radio designated for this purpose, not that ‘there was a radio installed’. No one knows where it went or who got it, or if it was resold as excess inventory, at this point I don’t have enough of a global picture to say much more about that” (Eliason, 2009).

The primary purpose for Eliason at this point is to understand the KNN and be able to manage it efficiently. Eliason details the importance of the Ktunaxa having a functioning network, stating that they are a government entity and that “if the government goes offline then they cease to do business, [that’s] a huge loss with a huge dollar value attached to it.” This statement may refer to either the government of the Nation or the Federal Government and is true in either case.

In discussing the state of the network infrastructure currently, and what difficulties JSL may face as a management company, Eliason described technical aspects of the KNN that prove challenging. For example, the BECK system supplied by PacketFront Inc. ‘is so complicated that it costs a lot for training to have people maintain it, even to upgrade it.’ Maki in discussing the interconnectedness of the events that occurred during the network project reported that PacketFront Inc was a company owned by a friend of Lawson (WCOMs CEO). Lawson recommended the Ktunaxa Nation purchase this specific equipment stating that in his experience (representing the party responsible for the

technical implementation of the network) the BECK system would be the most cost efficient equipment for the project. Eliason affirms JSL's plans for the KNN include developing the network both north and south of Cranbrook to establish the local subscriber base and then completing the build for the final backbone that will complete the process of providing connectivity to all four Ktunaxa communities. In discussing the political climate (or turmoil) around the KNN project and whether or not members of the local business community are open to doing business with JSL for the KNN, Eliason replied:

"I think the biggest thing for the Nation network has been the political mess that came from it. There were a lot of city members in different municipalities who were members of WCOM and when WCOM fell apart with the Nation I think it put a bad taste in a lot of peoples mouth's. But with a local partner [JSL] who has a proven track record,... a proven vision, and a long term strategy for growth, I'm sure people will come around. There will always be parties that aren't involved, but for the general population, yes" (Eliason, 2009).

Prior to the introduction of JSL, connectivity was available only at the St. Mary's Band, and inconsistently in other select locations. With the introduction of JSL as the network manager, new customers have been connected, which was not possible prior to having an operational network manager. The KNN is expected to serve both residential and commercial customers. For the example

"the Cities of Cranbrook and Timmings as well as the Regional district have an interest in using a piece of Ktunaxa fibre or alternatively the networks wireless capabilities either as a redundancy, back-haul or to actually serve citizens" (Maki, 2009).

JSL will be promoting partnerships with them and are promoting the notion that rather than creating any duplication in services, interested parties will work together specifically in leasing their infrastructure to provide connectivity in specific areas.

While individuals in communities will pay for internet services, the cost will be similar to what residents pay in major urban centers in Canada, the infrastructure has been subsidized via Industry Canada, NetworkBC and matching funding. There has never been a business case to provide that infrastructure. Armstrong (2009) stated that there are approximately about 500 First Nations homes that may potentially connect to the KNN and that in order to cover the operation and maintenance costs of the KNN, twice as many subscribers would be needed, just to break even. "Even if everyone subscribed there's still not enough revenue generated to support all the overhead costs, the administration costs, the maintenance costs and so on" (Armstrong, 2009). JSL will be upgrading the connectivity infrastructure in all the Ktunaxa communities. Every First Nation home has been equipped with a Customer Premise Equipment (CPE) box and the next step will be to ensure that all homes are loaded onto the KNN and able to connect to the internet. This will include an assessment of all communities to see which homes and administrative buildings still need connectivity.

In terms of recourse, Armstrong, Teneese and Maki expressed that the Nation has consulted a lawyer and concluded that at this point their main focus will be to make the network project successful and to begin creating revenue sources that will support future costs and also recover costs already incurred (Maki, 2009; Armstrong, 2009; Teneese, 2009). Once the KNN is more fully developed as a business the Nation will reconsider the avenues of recourse available to them at that time.

Armstrong (2009) reported that “after going through months of running losses on the system and finding many operational system design difficulties and connectivity issues at the end of the day things are more positive and the outlook is positive” (Armstrong, 2009). There is a business plan moving forward to generate revenue. The plan is the keep the four communities connected as well as the KNC collective while also being able to support and subsidize the operation by having commercial customers. One participant reports:

“Since we’ve been working with JSL we’re certainly a lot more encouraged by the ability to make this thing happen, to make it real in the broad scope that we’d initially contemplated. Right now we have the bits and pieces but its’ nowhere near the picture that we’d drawn for ourselves when we were first having these discussions” (Teneese 2009).

The provincial government who originally awarded access to the RNC’s to WCOM have expressed they are not willing to reassign the access licences. Armstrong reports that the licences were part of an election promise made seven years ago at a time when WCOM was promoted as an organization that would work to combine efforts and provide connectivity for the East and West Kootenay’s. Participants reported that today WCOM is comprised of Mayors throughout the East and West Kootenay region. In discussing the change of membership for the WCOM board of directors, one study participant stated

“The fact that board is comprised of mayors now, what that says to me is that they obviously weren’t given the whole picture, that they’d been given a sanitized version of events from a WCOM perspective, and because they’re Mayors and they’ve got 101 things on their plate they are not going to take the time to find anything out. They are being told something that they think they

have no reason to not believe....there has been no due diligence on their part” (Participant 61).

4.7 Looking Back: Participant Conclusions

Today, individuals that work closely with the Ktunaxa Nation state that the Ktunaxa are leery of doing business with local municipalities in the region as a result of negative experiences that occurred during the KNN project (Maki, 2009; Armstrong, 2009).

Mayors in the region continue to support WCOM and reportedly a significant number of WCOM board members are also Mayors in the local area.

Network narrative participants felt that one plausible explanation for the breakdown of relationships within the WCOM group began with the introduction of private for-profit companies (Maki, 2009; Armstrong, 2009). Philosophically, the initiative was founded on the notion of social enterprise and with the introduction of private companies there was a shift from what was originally formed as a not-for-profit government utility service, similar to roads and sewers, to a for-profit money generating enterprise in which investors would profit. The shift occurred at the expense of the Nation’s communities and the taxpayer funded infrastructure project (Maki, 2009). Participant 63 stated that:

“the relationship between the Ktunaxa Nation and the Municipalities was forced and would otherwise have not occurred because the Municipalities were not interested in working with the Ktunaxa” (Participant 63, 2009).

Those representing the Nation in the KNN project expressed that in their experience local governments were not interested in participating in business ventures with First Nations.

“The fact that the original dollars available to do this work were attached to First Nations participation and involvement was a critical piece of the whole thing. At first we thought ‘Oh awesome, now finally we have some ability to influence, we have some ability to be in the driver’s seat’We were all so hopeful and excited in the first place to think here we are in this partnership [with WCOM and the Municipalities] to create this open network not only for the Ktunaxa, but for those of us who reside in this corner of the world to actually be connecting to technology that’s cutting edge, that’s not two or three decades behind the times...in our naivety we actually trusted that relationship, that people were going to do what they said” (Teneese, 2009).

In the past, and now underlined by the KNN experience, the Ktunaxa have found themselves excluded from the ‘business world’ in the East and West Kootenay’s despite other successful business ventures such as the St. Eugene Mission Hotel Resort and Casino. Many in the area believe this is due to discriminatory business practices (Maki, 2009; Armstrong, 2009). For example, when approached by the current network management company, JSL Forum, about the potential creation of business relationships, the Mayor of Timmings (a nearby municipality) indicated a positive interest in utilizing the newly established internet service. When the Mayor of Timmings learned that the Ktunaxa Nation were the owners of the internet service they decided that they were not interested in doing business with the Nation (Maki, 2009; Armstrong, 2009). However, Armstrong (2009) reports this particular sentiment is not new to the Ktunaxa but rather has been lived with for decades. Both Maki (2009) and Armstrong (2009) reported that there is a feeling within the Ktunaxa Nation that the only way to break through and change discriminatory views is to amass multiple business successes.

“It’s almost a feeling in the Nation that this broadband project has to be a success to add to the pile of successes to make it easier for whoever comes next to break through the discrimination and into the business clique in this area” (Armstrong 2009).

JSL Forum sees the KNN project as an opportunity and believes in a vision for connectivity within the Nation and in surrounding areas.

“They’ve [JSL] been able to get towers up and running and now we’ve got our business plan and our marketing strategy, and we’re launching soon with better speed and within the month we’ll be launching the business, finally” (Maki 2009).

JSL forum is now the management company for the KNN. However, the network will be rebranded and marketed under the name FlexiNet to local residents and the Ktunaxa name will not be associated, rather the Ktunaxa will become a silent partner.

In the end, individuals involved in the project on behalf of the Ktunaxa Nation are left with the belief that there was a misuse of their equipment, their financial contribution to WCOM, and their trust. Nanofibre was a distinct part of that misuse (Maki, 2009).

Multiple participants (Maki, Armstrong, Teneese) reported that it was later discovered that the connectivity services being provided in Smithville utilized the KNN. Mayor Reimer, the owner of Nanofibre was also on the WCOM board and the RD board, benefitted from this both financially and politically, and at the expense of the KNN project. The Smithville mayoral election (October 2008) followed the launch of the Nanofibre network and Reimer chose not to run for re-election.

Maki (2009) reported informing individuals representing NetworkBC and the Province that WCOMs project manager was corrupt, however, NetworkBC has refused to reassign

the access licences provided to WCOM or to come to any agreement with the Ktunaxa on how best to proceed knowing that the equipment housed in the RNC's legally belongs to the Ktunaxa Nation. Since the exit of the WCOM project manager approximately one quarter million of assets including connectivity equipment and infrastructure remains unaccounted for.

The broken relationships that are a result of this project are highlighted by Maki's ending comments:

"The way that we're doing this now, because there's much bad blood that came from this project, it's much more of a neutral project now, and the name is probably going to be Flexinet. There's no connotation to First Nations... it was a business decision to keep it very non-Aboriginal because people have said they won't go with that, won't go with a First Nations brand" (Maki 2009).

The KNN will be marketed as non-Aboriginal, as was advised by the Nations current management company. Today, Maki is pushing forward with the network project and business plans. After surviving the last two years and enduring the complicated events that took place, there seems to be light on the horizon. In discussing the future of the KNN, Kathryn Teneese, Chief Negotiating Officer for the Ktunaxa Nation, stated in her interview:

"I'm confident we are going to be able to get to the place that we originally intended for ourselves...I'm looking forward to the day that we have the opportunity to take stock of what's happened. To me, it's something that needs to happen..., very clearly laying out the challenges we've had and maybe [we will find that] there are some legal remedies we can seek. ...The main thing right now is to get the network operational and bring in some income".

Many participants closed in stating the future is bright and that with JSL Forum on board original project goal of providing internet connectivity to every First Nation household in the Ktunaxa communities will become a reality in the near future.

Box 2: The Players

The Players (Name, Professional Designation, and Related organization)

People

Lynn Armstrong: Accountant for the Ktunaxa Nation (both during the network build and currently)

Daniel Dean: Director, (NetworkBC).

Cindy Jeromin: Industry Canada

Adam Hill: EEG Communications, Developer, (Nanofibre project).

Thomas Lawson: CEO, (WCOM). Developer, (Ktunaxa Nation Network project).
Developer, (Nanofibre project).

Sophie Pierre: Chief Ktunaxa Nation, during the time of the network builds.

Don Maki: Director of Traditional Knowledge and Language, (Ktunaxa Nation)

Shaun Reimer: Mayor of Smithville, Owner of Radium, Board member of WCOM, and member of the Regional District.

Jason Richie: board member (WCOM).

Kathryn Teneese: Chief Negotiating Officer Ktunaxa Nation

Organizations

Industry Canada: Department of the Government of Canada, provided partial funding for the Ktunaxa Nation Network project.

NetworkBC: A Provincial project body tasked with connecting the unconnected in British Columbia.

Regional District (RD): provides government services to unincorporated areas in the East Kootenay area (consists of elected board members).

Western Communications (WCOM): a not-for-profit organization whose mandate is to support connectivity projects.

CHAPTER FIVE – Findings

5.1 Introduction

This chapter presents the main findings of this study. The first section describes the connectivity situation of each community. The sections that follow describe the individual and organizational level uses of the Ktunaxa Nation Network and includes data collected from both ‘community member informants’ and ‘expert informants’. The category ‘Community Member Informants’ refers to those living in the communities for a substantial period of time as opposed to a band member, a connotation that indicates an official status. The discussion of connectivity and ICT use is structured according to the same categories found to be useful in the literature review and include uses related to land, uses related language, economic use, educational use, use related to health, and social use.

5.2 The Ktunaxa Nation Communities: Access to Connectivity

Each Ktunaxa community had a different connectivity profile. The KNN utilizes a fibre optic cable or a hard line right to the user either to both administrative offices and residential homes, or a hard line to administrative offices and a wireless connection to residential homes. Every Ktunaxa Nation home was equipped with a Customer Premise Equipment (CPE) that enables use of the KNN. The modems and their installation were

both provided by the Nation via the initial Industry Canada funding. This is significant in that other networks have faced low levels of technological adoption due to the initial costs of set up. The monthly cost (the monthly fee for internet service, usually \$30-\$50) of internet has also been cited as prohibitive and was mentioned in two respondent interviews. Another observation made by respondents, was that due to the lack of (and change of) management company, billing services had not been maintained and those receiving internet services initially were, after some time, receiving them at no cost as no company issued a bill or invoice.

The Ktunaxa Nation is spread over a 70,000 square kilometres of mountainous terrain. Although there are many other Ktunaxa individuals residing both in nearby towns/municipalities and other Canadian provinces, there is currently a shortage of housing on reserve (Participant 48, 2009).

“The Traditional Territory of the Ktunaxa Nation covers approximately 70,000 square kilometres (27,000 square miles) within the Kootenay region of south-eastern British Columbia and historically included parts of Alberta, Montana, Washington and Idaho” (Ktunaxa Nation, 2005).

The Ktunaxa developed a Nation Council in the 1970’s to promote political and social development.

5.21 St. Mary’s Band

St. Mary’s Band, as of November 2009, had 192 members living on reserve, 22 members living on other reserves, and 131 members living off reserve. St. Mary’s score 78 on

INAC's Community Well-being Index, as compared with the all Canadian First Nations average score of 70 and the non-First Nations average score of 85. The community well-being index was developed by INAC and measures well-being in Canadian communities, combining "indications of income, education, labour force activity, and housing conditions." The information utilized to generate this score was from the 2001 Canadian Census (INAC, 2009).



Photo 2: Beautiful view from St. Mary's.

Photo 2 shows the beautiful view from the Eugene's driveway including the mountains and the Hoodoo's. (The Hoodoo's are part of the Ktunaxa Creation story, which can be found on the Nation's website (www.ktunaxa.org).

St. Mary's was the first community to be connected to the KNN. Within the Ktunaxa Nation's Territory, St. Mary's is considered to be centrally located and is 5-10 minutes away from Cranbrook, BC, a main shopping district in the area. The well known St. Eugene Hotel, Resort, and Casino is located at St. Mary's Band. The St. Mary's Band is also called St. Mary's and has about "400 members ...and is the largest of the four Ktunaxa bands in Canada" (Linnarsson, 2008). Every home at St. Mary's was provided with access to the KNN via a hard or fibre optic line to the home. However, the consistency of the KNN has been problematic in the past as a result of the issues surrounding network

implementation. Today the KNN offers service comparable to any large competitor for example, Telus (Dickson, 2009).

Individuals knowledgeable about the Nation's IT department commented that although initially there were problems with connectivity (specifics can be found in the Nation Network Narrative), other problems continued to exist after connectivity problems no longer remained an issue. Examples of these might include that older computers with older software will run slower regardless of the connection. Additionally, although 30 out of 31 respondents reported being aware of and using antivirus it was reported that individuals would sometimes forget to renew their antivirus and/or decide they might not need it (Dickson, 2009).

The Community Learning Center (CLC) at St. Mary's is located centrally in the community and is staffed by an individual who is also responsible for the proper functioning of computers at the band administration offices. This learning center is reportedly underutilized as a result of connectivity to the homes in the First Nation. Those individuals frequenting the CLC reported not having a computer at home. There were 12 computers in the CLC and all are connected to the KNN.

Lastly, due to the lack of a management company (see Nation Narrative for further explanation), after the initial round of connecting homes to the KNN, it was not possible

to add new customers for a period of time (approximately one year). Today connectivity at St. Mary's Band is similar to major urban centers in Canada.

Photo 3: The Community Learning Center at St. Mary's



Photo 4: St. Eugene Mission Resort at St. Mary's (the building was formerly a residential school and is now owned by the Nation which has used it to develop a successful hotel, golf resort and casino.)

5.22 Tobacco Plains Band

Population information is not available through INAC for the Tobacco Plains Band, reportedly as a result of non-participation in the Canadian Census. However, Statistics Canada Community Profiles 2006 reports a population of 67 and does not specify on or off reserve (Statistics Canada, 2009). One study participant estimated that today just under 100 people live on reserve, but that the off reserve population may be as high as 400.

The band hall at Tobacco Plains acts as a gathering place for community members and is the main spot for connectivity. Homes that are close to the band office may also be connected to the KNN. Three homes are connected to the KNN. The homes at Tobacco Plains are widely dispersed and can be difficult to access. Other residents reported having an internet connection through a satellite provider and the duty free shop (located approximately half an hour south of the band office and close to the US border) reported having internet through Shaw. Band office employees reported that the network `goes down` (doesn't work) periodically. Prior to the introduction of the KNN the band office at Tobacco Plains utilized Telus dial-up, which was reportedly very slow. Since the introduction of the KNN two band employees stated that their communications with the other Nation sectors have improved significantly. Individuals visiting the band hall stated that there is a desire to have the KNN available in all Tobacco Plains homes.

Although the six computers located in the band hall were not considered to officially be part of the CLC project, the computers and internet were being utilized by community members for educational and other purposes. One respondent attended the band hall every day to work on high school courses. One evening spent at the band hall included a commonly held event; youth groups. That evening the activity was a personality workshop in which each group participant took a personality test online on the CLC computers and discussed the results with the visiting group facilitator.



Photo 5: On way to Tobacco Plains

5.23 Akisqnuq First Nation

As of November 2009 the Akisqnuq First Nation included 261 members; 113 living on reserve, 97 living off reserve, and 51 living on a different reserve (INAC, 2009). INAC reported that Akisqnuq scores 80 on its community well-being index, as compared with the First Nations average score of 70 and the non-First Nations average score of 85.

Akisqnuq First Nation is located about 10 minutes from the town of Riverbend, BC.

Homes in this community are also very spread out. Akisqnuq had the most vibrant CLC of all the Ktunaxa communities. The CLC at Akisqnuq is located in the basement of the band office and is painted with bright colors creating a very welcoming environment. The CLC staff were knowledgeable and helpful. On two occasions more than ten children attended the CLC after school for homework and games. Socializing among the children took place during the time they used the computers.



Photo 6: The Community Learning Center at Akisqnuq.

The CLC at Akisqnuq has two employees to supervise that have posted colors and animals in the Ktunaxa language on the learning center walls. Twelve computers are utilized here by community members for a variety of reasons. Two computers are not connected to the internet but are designated to be used for language programming and the use of language discs. A book about internet safety is available and has been

frequently borrowed by parents and others, according to one of the CLC employees. In reference to the CLC at Akisqnuq, one person stated that people in the community are aware that the internet connection at the CLC goes down a lot and is not reliable. Consequently, individuals who `have something important to do', such as submitting Employment Insurance forms or paying bills online, are more likely to drive the 15 minutes to Riverbend to use computers and the internet at the college (a branch of the College of the Rockies), at the public library, or at the employment office, rather than come into the CLC or band office. People do not want to be in the middle of paying their bills and have the internet go down.



Photo 7: The Two Computers in the Akisqnuq CLC used for Language Programming (and pictures on the wall behind the computer containing a picture, a letter and the matching Ktunaxa word).

The health unit at Akisqnuq is a newer building and is equipped with videoconferencing capabilities. Elders are reported to use the videoconferencing after hours for social gatherings with friends and families in Ontario at Christmas time. One individual reported that the social workers in the building were required to have a `consistently

working internet connection`, implying that there is likely two internet service providers (possibly the KNN and Shaw or Telus) in Akisqnuq. Individuals utilizing the internet both in the health unit and at the band office were unsure what service provider they were using.



Photo 8: Akisqnuq CLC.

5.24 Lower Kootenay Band

The Lower Kootenay Band, as of November 2009 is reported to have 90 members living on reserve, 16 members living on other reserves, and 107 members living off reserve (INAC, 2009). Lower Kootenay rates 79 on the community well-being index, as compared with the average score of non-First Nation communities which is 85, and the average score of all First Nations in Canada which is 70 (INAC, 2009).

The Lower Kootenay Band is located approximately 10 minutes from the town of Creston, BC. Creston, near the Canada/U.S. border. Unlike the other Ktunaxa communities the Lower Kootenay Band had access to Shaw high speed internet prior to the introduction of the KNN. Similarly to other centers, Shaw services are offered in

bundles, which means a customer can receive a discount on their services if they subscribe to more than one service with Shaw (e.g. phone and cable, or cable and internet or all three). When the KNN was first implemented there were issues with the connectivity as described in chapter four. In the Lower Kootenay community individuals expressed that those who had initially subscribed to the KNN later switched to Shaw in order to utilize a more reliable connection. Both the band office and the school are currently connected to the KNN. The KNN currently provides fibre to the home in Akisqnuq.

The CLC at Lower Kootenay is housed in the Yellow House; a building that also houses the health unit. Reportedly, promoting this CLC has been particularly problematic potentially due to older computers resulting in slower speeds. One interview respondent cited the lack of a printer as a deterrent, and others discussed that there was no need for people to travel to the Yellow House because if an individual was an internet user they most likely had a home connection. The person working at the CLC was currently participating in a number of projects for the CLC with UBC and to promote the center for use by Lower Kootenay community members.



Photo 9: Cherry fields on the way to Lower Kootenay.

5.3 Uses Related to Lands and Resources

Projects related to land that include the use of connectivity and ICTs take place in the Nupqu Development Corporation and the KNC Lands and Resources Sector. Each band has a Natural Resources Director and related positions that utilize connectivity and ICTs in relation to the management of land.

The Nupqu Development Corporation is a professional natural resource management company “owned by the communities of the Ktunaxa Nation...and has been in operation for over 12 years” (Nupqu Development Corporation, n.d.). Nupqu is the Ktunaxa word for black bear. The company’s mission is to “capture wealth, economic, employment, career development and other benefits from the natural resource industrial activity within the Traditional Territory” (Interview 31, 2009). The services provided by Nupqu displayed in the table below

The Nupqu Corporation promotes First Nations businesses and partner with resource developers working within the traditional territory. Nupqu

“is here to provide revenues and employment opportunities for the Nation. It’s also the business arm of the Nation, as opposed to the governance sectors....How we deliver on our mandate of providing revenues and employment is both directly and indirectly working with communities to employ their people on projects and to promote First Nations businesses” (Participant 31, 2009).

The company is structured to train First Nations individuals to replace the current employees at the level of directors. The mentoring structure is based on the notion that

Table 1: Services Provided by the Nupqu Corporation.

FORESTRY GROUP:	ENVIRONMENTAL GROUP:	FOREST TENURES GROUP:
SILVICULTURE: planning administration, tree planting, stand tending treatments	WILDLIFE AND WILDLIFE HABITAT: Inventory and monitoring, habitat assessments, species at risk assessments	Community forest K1W, Forest and range opportunities licences
FOREST HEALTH: forest health management plans, ground surveys, fall and burn treatments	CONSERVATION BIOLOGY AND RESTORATION: Re-vegetation and enhancement, invasive plant inventory, treatment and monitoring	
FOREST PLANNING: technical forest development services, licence to cut applications, timber cruising, mapping	ENVIRONMENTAL MONITORING: Water sampling and monitoring, erosion and sediment control	GENERAL CONTRACTING GROUP: Seismic clearing, traffic control, short term labour, danger tree falling
WILDFIRE: ecosystem restoration, prescriptions, ignition, suppression and mop up fire crews, wildfire danger tree falling, training, prescribed burning, wildland urban interface assessments	IMPACT ASSESSMENT: Baseline data assembly, environmental assessments	

providing capacity and opportunity through training will ensure the company is later managed by Nation members. The Nupqu corporation must communicate with all four communities regularly, as well as with Nation members and clients (e.g. resources development companies, governments). One participant stated

“I mean with forest planning work in general there’s a lot of interface with the Ministry of Forests and that’s online. We use MapView to access forest cover information and tenure so you can zoom in. Also there’s the FTA, the Forest Tenure Administration where we develop a cutting permit and it gets uploaded into that application” (Participant 37, 2009).

Project partners include Tembec, Natural Resources Canada, BC Hydro and the Ministry of Forests of BC (Participant 37, 2009). One participant stated there has been a significant increase in the company’s ability to communicate effectively, for example to send large maps and other images via email (Participant 31, 2009). When asked if the internet was important for Nupqu one knowledgeable interviewee responded

“Oh it’s critical. If you’re going to compete in business, without any assistance from the government, towards the Nations statement of being self sufficient, require them to have lots of different structures in place. A critical one is going to be an effective means of communicating because there’s limited numbers of people available to do the types of work that are required governance, self sustaining businesses, and economically. In order to compete effectively you have to have the same sort of resources available to you that other do” (Participant 31, 2009).

The Nupqu corporation is currently working on redesigning their website not only to include more information but to be more interactive and user friendly now that Nation members and others are more likely to access their site, because they have access. More than one individual representing Nupqu stated that email communication with clients is considered very important, for example in communicating with oil and gas companies based in Calgary and BC Hydro which is based in Vancouver (Participant 37, 2009). Both Nupqu and the KNC lands and resources sector report using the internet for research purposes. One participant employed by the KNC lands and resources sector stated “We rely heavily on the internet for research” (Participant 1, 2009). Additionally, Nupqu has an arrangement to do projects with Tembec, a forestry company, and provides them

with forestry services in the traditional territory including forestry development such as roads, cut blocks, and planning duties (Participant 38, 2009).

One current project of Nupqu involves woodlot applications for which internet, Microsoft word, and excel spreadsheets are utilized (Participant 38, 2009). Additionally, the planning department utilizes a GIS program called ArcView. Other programs utilized include Imap, GPS, and other applications for digitizing maps (Participant 37, 2009). In discussing the usefulness of connectivity and various applications, one participant stated

“well in this day and age people need to have that, it’s just a basic requirement right, and when you don’t have it then you cannot compete with your competitors that do have it. So it’s allowed us to grow, and to keep up with growth I guess. I don’t know if it’s made anybody better, but it’s definitely made the company better. We could not be what we are today without high speed (Participant 38, 2009).

In working with the TransCanada Pipelines, Nupqu employees are required to complete an online training module (developed by TransCanada Pipelines) every two years. Once the training module is completed, a certificate is printed that must be presented to Nupqu and kept on file to enable the individual to work on the TransCanada Pipeline project. In monitoring individuals completing the online modules, one Nupqu director stated that computers skills of community members he interacts with have improved over the past year or so.

The KNC Lands and Resources Sector have engaged in projects that include the use of technology to preserve and record culture. One project is called the Place Name Database which documents places that have a Ktunaxa meaning or story. A single server

database is utilized along with GIS to map the areas and sites. In the future the Place Name Database may be used as an educational tool along with audio and video. The project compiles information already available from interviews completed over the past 20 years with knowledgeable Nation members (Participant 2, 2009).

Another series of projects currently underway are called the land and occupancy studies which will eventually operate in conjunction with the Place Name Database. The information available through the land and occupancy studies includes private information and consequently access to this information will be restricted. The land and occupancy studies include a GIS component and a database component. Original documentation will be scanned into an information management system (Participant 2, 2009).

“You can search the documents and place audio videos and store it there and that’s going to be linked to the database which is in turn linked to the spatial component, the GIS” (Participant 2, 2009).

The information management system is a Nation-wide initiative that aims to standardize the Nations filing and flow of information, past, present and future (Participant 62, 2009). Another goal of the information management system, important to all First Nations administrative employees, is to reduce the number of duplicate referrals received from different levels of government. This is considered to be part of the work flow component. In order words, one referral is sent to the KNC lands and resources sector where it would be entered into the system, following that the document would be sent to the community for input/feedback and then back to the KNC lands and

resources sector, and then back to the government agency. Currently, each entity may receive the referral without any indication of whether revisions have already been made. “The work flow component of the information management system needs to have high-speed, it can’t be done on dial-up” (Participant 2, 2009).

One participant working for the Ktunaxa Lands and Resources Sector discussed a potential project she would like to see including the development of an interactive website aimed at increasing youth involved in land related issues.

“What I’m interested in doing is getting a website going for lands and resources where other community members can interact ... [that would provide information about the cultural significance of particular areas]... and also for the youth, [a site] where they could interact with us (at the lands and resources sector) and with each other” (Participant 52, 2009).

The main idea expressed was the inclusion of interactive games and activities that would engage youth and provide a learning experience related to traditional land values that youth would be interested in. The participant also expressed a need for youth to connect to nature and the land. The website could include “the fish and the animals and where we go and collect huckleberries, collect plants and what we use them for” (Participant 52, 2009).

A project related to land use and occupancy is underway at St. Mary’s Band and is called the Strategic Land Management Plan which is a database. Every individual that wanted to participate from St. Mary’s was interviewed about their past and current land use activities. Each land use activity was mapped using GIS. Participant 48 reported that

individuals residing at St. Mary's are becoming more comfortable with technology and more accepting of the notion that technology is assisting the Nation in moving forward and accomplishing their goals (Participant 48, 2009). Additionally, this same participant discussed exactly how technology has been of assistance. For example, discussing with a group of people where a future housing development should be located is now much easier because the valued places of community members have been recorded and mapped, people have provided their input, and sacred areas have been identified.

“Now we can say with this value in mind and all of these values mapped here for you, outside of these areas, what are the parameters for development and where would you like to see development occur?” (Participant 48, 2009).

This assists the group in seeing what areas are available for development and taking into consideration all the different land use activities and traditional activities of the Nation members (Participant 48, 2009). Different sites mapped for this project might include for example, fishing, hunting, spiritual, egg gathering, berry picking, and waterways.

Further, the layer of map that displays traditional or current land use activities is only one layer of the GIS map. Other layers include legal definitions where applicable, contaminated sites where applicable, may identify land currently involved in treaty negotiations, as well as all the locations a typical map would include. Eventually, the information will be used to in the future creation of zoning bylaws within the traditional territory (Participant 48, 2009).

Of 31 'community member informant' participants, 17 participants were aware of uses of connectivity and ICTs related land and resources in their communities. The group of

17 includes 12 females and five males, 12 respondents were between the ages of 31-50, while three were 30 or under, and two were age 51-70. Eight of the community member informants that provided data related land and resources were from St. Mary's Band, 3 from Tobacco Plains, 5 from Lower Kootenay, and 1 from Akisqnuq, as is depicted in Figure 23. Every person that provided this type of data responded yes when asked if they were band members.



Figure 24: The Community Distribution of Participants Reporting Uses of ICTs related to Lands and Resources.

The most commonly reported area of connectivity and ICT use related to lands and resources was traditional land use and occupancy projects. Participants reported using a number of related tools for such projects such as GIS mapping, google earth, and ERSE Canada. Of the 17 respondents knowledgeable of projects in the area eight people described at least one (in some cases more than one) traditional land use and occupancy project and indicated participating in the project as an employee, by being interviewed, or had heard others discuss the project in their community. Multiple participants in this category of eight described an initiative that had taken place approximately two years ago in St. Mary's. This initiative included interviewing Elders about their traditional and

current land use activities such as berry picking, hunting, trapping, camping, where wild potatoes can be found. When questioned about why this work was undertaken two respondents expressed that the Nation recognized the need to record their current and traditional uses for purposes such as treaty negotiations. One participant reported:

“To do this we had to do a bunch of mapping so we went to the GIS people (at the Ktunaxa Lands and Resources sector) and printed some maps and we interviewed people and said okay now where is it that you hunt? Fish? Each individual showed us on the map where they hunted and how many kills they had in that area. We recorded that and now it’s just to be kept confidential and private to be used when we need it. We kept all the maps and stuff and who the interview was by. Certain colors were used for how many elk were kills there and how many beavers and who does the trapping cause there’s not that many people that do trapping anymore” (Participant 22, 2009).

Potential uses of the KNN as suggested by participants include the use of email to engage Nation members and provide information as to the current projects of the lands and resources sector, and the use Google Earth to enable Nation members to record and transfer information to the lands and resources sectors regarding their current land use activities. For example, if someone was picking berries in a particular location and could securely log in to a Google earth type program to record information that could be helpful in identifying treaty land.

“You can see the terrain almost as if you’re standing there, so if someone went berry picking somewhere, they could easily mark the area and then add the attributes, the who, what, when, and why and where of course would be captured automatically when they digitize the point or the line or whatever they choose to do” (Participant 2, 2009).

One KNC lands and resources employees reports being interested in technology (e.g. connectivity and the internet) related to mobilizing individuals to contact (phone, email, petition) government and effect policy in this manner (Participant 1, 2009).

Another individual reported using the internet to access the Species at Risk Act (SARA) in order to better understand how species at risk are listed and to determine the appropriate recovery strategies to apply. Another individual discussed the notion that First Nation reserves have become natural havens for endangered species as a result of their low levels of development (Participant 1, 2009). The ability to access the procedures and standards online for field procedure protocols, according to Participant 53 (2009), “ensures that integrity of data is protected and ...[that] it’s done the same way every time.” This participant emphasizes the role the internet in research and email communication between organizations in discussing a current project with Royal Rhodes University called Wildfire Urban Interface and Bio-fuels Utilization. Additionally, writing proposals for continued ecosystem and grasslands restoration is all done online now.

“Most of the funding we get is through electronic applications and is pretty well all done online. For most proposals there are online templates now for everything. It’s actually easier because they’re really specific about what they [funding agencies] are looking for and what they will fund its laid out pretty good” (Participant 53, 2009).

Further, Participant 53 (2009) states the internet is also utilized for remote sensing data and online predictive models for fire suppression.

Seven individuals reported using connectivity and ICTs for work purposes. One participant reported photographing events taking place in the community, for example clear cutting, to present via power point in a recent band meeting. She prepared a slide show to communicate these events and to facilitate discussion with other band

members. One respondent worked as a bio-engineer and reported using Google Earth and online mapping in a current project creating virtual forests.

“I’m up at the mine site doing reclamation work, we plant trees, measure soil, take water samples, all that sort of information and find out what sort of plants and vegetation will grow and make maps and plot it all out on the computer” (Participant 15, 2009).

One participant reported using computers and email to send data taken from local water samples to a lab in Calgary to be analyzed. Multiple participants reported using the internet and related tools to communicate with the Ktunaxa Nation lands and resources sector. Reportedly, there was a significant increase in the ease of communication with email and the newly installed VoIP phone system, which eliminates long distances charges between communities and enables Nation employees to reach co-workers using a four digit code. Two participants reported using computers and the internet to transcribe for Nation research projects which included interviewing elders, in some cases about their land use activities. One Nation employee reported using information that can be accessed publically on the Ktunaxa.org site to create a power point presentation on the contemporary issues of the Ktunaxa Nation related to lands and resources, for a class of local grade four students.

“I did an eight slide presentation, I just took information we already had and everyone was asking about it and I said you know all this information is available on the web at Ktunaxa.org, please go there and check it out, its public knowledge” (Participant 33, 2009).

Alternatively, one participant described in detail how they performed their position within the Band office without using computers or the internet to any large extent. This participant was responsible for community communications, for example,

communicating to others when band meetings would occur and what issues would be discussed. When asked how he would 'get the word out' about an upcoming band member, the participant replied

"I post on the board bulletin board here in the band office. I could send out a mass email, but I don't know how many houses here in the community have a computer. And I'm still pretty certain that even if I were to email everybody, everybody would say they didn't get it" (Participant 56, 2009).

Participant 56 had a computer beside his desk that did not work, and felt that this enabled him to get more work done. This participant also reported being the lands coordinator for his community and mentioned that he enjoyed reading online articles, available from the Ktunaxa lands and resources sector webpage. Additionally, this participant was responsible for the proper functioning of his community's water system. Related tasks include installing channels to keep land from flooding, clearing channels and culverts, and maintaining/replacing the twin pumps. When asked where the new twin pumps would be purchased the participant responded that he would research different suppliers online to find the best price. This participant described his use of the internet as limited. However, he discussed reading articles online and researching prices online. Further, although this participant does not use his work computer, he reported checking his personal email frequently from his home computer.

Another participant expressed how the internet and computers have become somewhat important in the operation of his personal business as a wildlife guide. When probed about the means of communication between himself and clients or potential clients the participant responded that:

“Actually it’s going back and forth on the email, we send wildlife pictures and whatnot and I keep in touch with a lot of my clients that way. We email back and forth and talk about how hunts went (Participant 9, 2009).

As a band office employee this participant discussed using videoconferencing to attend a meeting being held north of BC in Yellowknife, NWT, using email to communicate with co-workers, and using GIS mapping both in his position as a guide and at his position in the band office. However, when questioned about his opinion of using technology to assist him as a guide on the land the participant responded that knowing the land was the only appropriate method for a guide. The participant told a story of a hunter he was guiding who almost made a fatal mistake by relying on his GPS system. The hunter directed the driver to continue straight ahead for a particular distance, as shown on his GPS, in order to take the shortest route to their camp site. Thankfully, the guide was able to show the hunter that there was a 150 ft drop before it occurred and suggested a better route to travel around the valley.

In providing further explanation of the land use and occupancy project taking place at St. Mary’s First Nation, one respondent stated that once traditional land use activities have been reported they are then coded as values on a map, which are then grouped to show the range of values for a particular area within the reserve. Once the values of each smaller area can be observed in map-form Nation members will decide which areas are most important in terms of protection, for example cultural ceremonial spots. The Nation as a whole is looking to develop economically and knowing which areas of land may be available for development, as prescribed by the Nation members, will be

important in future decision making. For example, where to locate the newly proposed social housing project at St. Mary's Band and other buildings planned for the area.

"We're looking at economic development, where can we start looking at to build things, where can we build our houses" (Participant 32, 2009).

Energy efficiency was also a common topic among participants in this category.

Recently, an email had been sent to all Nation members discussing BC Hydro's new energy campaign. Those that expressed interest received a home inspection for energy efficiency. Those that took part in the inspection received isolative pads to place behind outlets, adjustments to taps and shower head, and an increased seal around exterior doors. The email stated that each reserve home was eligible to receive this inspection.

Participants reported using the following ICT applications in relation to land and resources: GIS, Google Earth, naming plants online, online archaeology programs, digitizing land use maps, using GPS for land coordinates, creating community and land use and occupancy maps, digitally mapping hunting and berry picking areas, digitally mapping reserves areas such as the graveyard, computer programs for environmental impact assessment, online renewal for hunting licences, internet related computer program to record items found on the land, for example arrowheads and gold, ESRI Canada (older GIS program), GIS courses, GPS for hunting and trapping, and to create and send via the internet wildlife photos and videos.

Many of the comments participants made about the use of connectivity and ICTs in relation to lands and resources included web content. Multiple participants stated they would like to see more information, specifically more updated information on the Nation's Lands and Resources webpage. Some participants expressed concern about too much information or sensitive information on this particular webpage and suggested that it would be desirable if there was an option for sign-in to view specific information, essentially ensuring that certain information was for Nation members only. As mentioned previously, one community member informant accessed content on the web at ktunaxa.org to create a power point presentation about the Ktunaxa Nation. Another participant reported searching online for information related to conservation legislation, The Species at Risk Act (SARA), and invasive plants.

Access to the internet, according to one participant, has enabled community members to become more informed on particular regional issues, and also to actively participate and express opinions about local issues. Jumbo glacier is the proposed site for a new ski resort in British Columbia, a development that is currently being officially protested by the Ktunaxa Nation. The Ktunaxa have stated that this land was traditionally used by the Ktunaxa people. Multiple participants reported receiving emails with information about the discussions taking place regarding the development at Jumbo, especially the environmental impacts the development will have on the area. Two participants reported signing online petitions to stop the development at Jumbo.

Another instance of land related use involving web content includes a desire expressed by one participant to have a Ktunaxa Google that would provide more information about their area and land and would include other information related to their traditional territory such as resources, archaeology, tourism (camping), wildlife, where wildlife is located and what areas should not be disturbed.

Table 4: Types of Use Related to Land as Reported by Participants

TYPE OF USE RELATED TO LAND AS REPORTED BY PARTICIPANTS	# TIMES REPORTED
1) Land Use and Occupancy Mapping Projects	12
2) Work Use (Land and Resources Sector or Other)	7
3) Wildlife Conservation and SARA (online)	3
4) Parks and Protected Areas	1
5) Naming Endangered Species (online)	2
6) Water Testing	2
7) Communicating with KNC Lands and Resources Sector	4
8) Accessing Land and Resources Information online	3
9) Online Research related to Lands and Resources	1
10) Videoconferencing (meetings related to Lands and Resources)	5
11) GIS	3
12) Traditional Land Use Activities	8
13) Land Development	4
14) Energy Efficiency	2
15) Accessing Web Content of KNC Lands and Resources (or Other Nations)	8
16) Invasive Plants information (online)	2
17) Environmental Impact (Signing Online Petition Against Jumbo Resort)	3

One participant reported accessing content online about other nations use and issues of land and natural resources.

“Today I looked on the Shuswap Kootenay Confederated Tribe and they’re talking about their natural resources and looking at things like water and water rights, and I thought we should have that” (Participant 39, 2009).

This same participant also stated information online about current treaty negotiations may prompt discussion of the topic and consequently become more informed.

5.4 Use related to Language

One of the foundations for building the KNN was to create a method to disseminate the disappearing Ktunaxa language to Nation members. The KNN has facilitated an online course called Ktunaxa 101 developed by the Ktunaxa Nation and the College of the Rockies (COTR) that has been operating for just over a year. The online language course was first offered in September of 2008 and another course, Ktunaxa 102 was deployed in September of 2009. The course is offered through the COTR and can be taken by individuals completing their grade 12 for two college credits, thus encouraging high school students to proceed on to college (Participant 6, 2009).

The Ktunaxa 101 online language course consisted of several lessons in which students complete assignments and submit them online. Each lesson involves practice saying a word while viewing the word and its corresponding picture (for example viewing the word tree while viewing a picture of a tree) while the computer records the student's enunciation. Once the student is happy with their recording they submit the recording to the course instructor via the internet. The instructor in turn, listens to the recording and provides feedback on the enunciation of the word (Participant 6, 2009).

“When they [students] are learning new words and understanding how to pronounce them, they create a flashcard, so each week students are required to

submit a flashcard with four words that they've learned from the class or outside the class with a diagram indicating what it is in English and in Ktunaxa" (Participant 4, 2009).

The intention of the flashcards is to create a resource book, or "little flip book", that can be distributed to all Nation members interested in learning their language.

"This way they [Nation members] can hang the little flip book in their homes and can work on one with their infants, children or youth to bring the learning back into the household which is how it was learned traditionally for many generations" (Participant 4, 2009).

Of the 31 community member informants, 30 responded to the question "Have you taken the Ktunaxa language course online?" Of the 30 respondents, from the four Ktunaxa communities, three were currently taking the Ktunaxa 101 at COTR, one person had completed both the Ktunaxa 101 and 102 at the COTR, one person took an online Ktunaxa language course from the College of New Caledonia, one person had completed a similar course at the Nicole Valley Institute of Technology, two people took the Ktunaxa 101 language course in a classroom prior to its availability online. One person reported never having heard of the course, ten people reported they had heard of the course and wanted to take it in the future, three people had families members taking the Ktunaxa 101 through COTR, one person was the teacher and developer for the Ktunaxa 101 language course, and seven people reported having heard of the course but having no interest in taking it. Interpreting this finding must include some additional contextual information.

The data for the language course shows that three people were currently enrolled in the program, one had already completed both Ktunaxa 101 and 102 online and 10

individuals reported an interest in taking the online courses in the future. Throughout the time period this course has been offered, three of four Ktunaxa communities did not have residential connectivity. Additionally, there are a finite number of adult individuals likely to have an interest in online courses. Of the 31 community member respondents asked about their participation in the language program only 9 were under age 30.

“income levels combined with price and availability of service play an important part [in the adoption and continued use of the internet and computers]. Culturally, a large portion of Web content has traditionally been dominated by a few languages. Demographically, younger individuals adopt ICTs, including the Internet, more quickly than older members of society. And studies also continue to identify other factors such as education, gender and employment characteristics as significant influences” (Innovation Analysis Bulletin, 2009).

In the USA, teens and young adults aged 12-29 (93%) are more likely than adults aged 30+ (74%) to be online (PEW Research Center, 2010). These statistics refer to individuals who have had access to the internet and computers since the technologically available. These numbers are likely further reduced when the target group of adults may or may not have the technological skills or confidence in their technological skills to take an online course. The language program is considered very successful.

Of the seven that reported no interest in taking the online language course a variety of reasons were cited including: having married a Ktunaxa person but having a different traditional language; not wanting to take an online course; taking (or having taken) a Ktunaxa language course in a classroom; or stated their knowledge of the Ktunaxa language was at a higher level than the Ktunaxa 101 online course.

The course is taught through a program called Moodle, an open-sourced community based tool for learning (see <http://moodle.org/>). Many interviewees throughout this study commented that it was very useful to be able to hear the language as opposed to just seeing it. The Ktunaxa online 101 course is

“a basic introduction to the language and you learn how to say different basic things like family terms, season, days of the week, numbers, counting, just basic things so students can start to learn it and then you know go home in the evening and start to teach their younger siblings or even their parents, many have lost it [the language]” (Participant 7, 2009).

Language revitalization in the Ktunaxa communities is not a new venture and began as early as the 1960's. The Moodle program enables one to record and listen to their voice, to play back the sound of your voice, and includes chat or instant messaging (IM) between the instructor and student.

“The college uses a program called Moodle and there's a forum on each course section as well as a chat where you can type stuff to the instructor and a button to record your voice. The window sound recorder will pop up and you record yourself and then submit it using a button in the same program” (Participant 6, 2009).

To facilitate students taking the course, the First Voices program is suggested as a resource and has “hundred's of recorded words, songs, stories, and legends” (Participant 6, 2009). For high school students taking the course and getting a head start on college credits (course is also available to college students), online course work is completed during computer lab time and is overseen by high school teachers. In addition to the online support, high school students are also assisted by an Elder that visits the high school once a week to practice the language in person. One project underway, according to Participant 6 (2009), is an Indigenous language spell checker.

This tool would act in the same manner as the spell checker in the Microsoft Windows Word program, but would be able to provide correct spelling for all the words currently in the First Voices database (Phillips, 2009).

During the time this study was being completed the second language course was also being created. The Ktunaxa language 102 online course includes “more phrases and is more advanced, this second course will build on the strengths developed in the first one” (Participant 7, 2009). Class sizes were reported to be between 15-20 people per semester (Participant 6, 2009; Participant 7, 2009). Twenty students per semester was reportedly about the maximum number that one instructor can facilitate.

In discussing the relatively new role of technology in language preservation one participant replied

“I say we should keep at it. Particularly for culture and language because we have very few speakers left and we lose a few every year, and they are our greatest resource when it comes to culture so we should still utilize our Elders as much as possible but we shouldn’t be afraid to utilize technology as well. Preserve the past, embrace the future” (Participant 7, 2009).

This modern perspective seemed to be shared amongst many individuals residing both in the communities and outside the communities. Similarly, another participant stated

“Technology can assist and enhance the learning of language, even though it’s not the traditional manner of how it was passed down by Elders from family to family. Especially at this time when we are losing a number of the fluent speakers that we actually have” (Participant 4, 2009).

When asked about the use of computers and internet in learning language and about having their language available online one respondent replied

“I think it’s a great thing and I hope that more people starting using it like when they become aware that it’s there use it. I think it’s great that our language is online because I find that the more exposure we get the better. And not only will it help the non-Native community get to know us but for the younger people it will encourage them to start using the language again. Because our language is almost dead. Not too many people use it only the Elders....the more exposure we get the better it’s going to be for our language to survive” (Respondent 40, 2009).

Another respondent stated

“I think it’s a really good idea, especially for those who don’t have access to language classes in their own community. Especially also for those Nation members living in Vancouver or Edmonton, they can still learn their own language” (Participant 5, 2009).

Close to all respondents supported having the online Ktunaxa language course and did not express any negative feelings related to having traditional content available through an online course or available on the web.

One Elder reported interviewing Elders when she was young and having many notebooks stashed away with words that no one uses anymore and records of conversations. The notebooks would be an excellent example of material that could be preserved online by scanning the pages or having them recopied. Once completed, words may be able to be added to the First Voices database and stories shared with future generations.

“I’ve got a big tub I was going through it the other day, and I found this notebook I used to have. I was writing in it in about 74 I think. I was interviewing Charlotte Basil from Lower Kootenay and my god, she’s got words in there like Agia [unsure of spelling here] it means geese in flight. I’ve got to copy that and preserve all that and the name of every part of the canoe that she used to make.... I’d go and visit with them and write down any conversation between them. But I wrote it in pencil and well...I’m going to have to work to copy them over again. Because a lot of people want them stories that I’ve got. Right now I can’t do much with my arthritis because my fingers are no good for me to write” (Participant 36, 2009).

This example coupled with the geography of the Ktunaxa communities illustrates a niche for connectivity and ICTs in language preservation.

Another development related to the use of computers in learning language was the Ktunaxa font. A particular letter in Ktunaxa can be quite different; for example one letter described by knowledgeable individuals as a barred L was formerly represented by a key commonly found on keyboards. With the new font there is a keyboard layout and a specific key will produce the barred L the way it should look. Different fonts for the Ktunaxa language have been developed over the years including one by the International Phonetic Association (Participant 40, 2009).

The Ktunaxa 101 course is facilitated by a program called First Voices, discussed earlier in chapter two, that “is a suite of web-based tools and services designed to support Aboriginal people engage in language archiving, language teaching and cultural revitalization” (First Voices, 2009). The First Voices program uses sounds, pictures, and videos to create interactive online language games for creative learning. Of 31 community member informants, 30 responded to the question “Have you ever heard of the First Voices program?” Eighteen people replied having heard of the program, while 12 had not. Many respondents expressed excitement about the program, especially about having the Ktunaxa language in the program. Selected responses included:

“First Voices has been so useful for me! When I was taking the class at the college [Ktunaxa 101 online] I was using it then. And even now every once in awhile if I’ve forgotten a pronunciation I will go and listen to it [on the First Voices website]. Sometime when I see an Elder I’m embarrassed to speak

Ktunaxa because I might say it wrong. That would be disrespectful....[First Voices] was a lot easier to use than I thought it would be” (Respondent 8, 2009).

In response to a question about the use of First Voices online tools and games:

“Yep, yep. They’re good. I’ve even started doing the hardest ones [games] and its helped me a lot. I’m their [First Voices] biggest fan. When it first came I was always one there!” (Respondent 39, 2009).

One respondent had not heard of the First Voices program; after an explanation of what the program was and when asked whether they may be interested in looking at this program in the future, the respondent commented that “Yes, definitely that’s something I would be interested in. For that purpose absolutely” (Respondent 28, 2009), indicating again, the positive response to the program. In response to “What do you think about the First Voices program?”, another respondent replied:

“I love it! I’ve got all the lettering, numbers, verbs, body parts, seasons, community places, times, and household items written down to go over. And we did all of that on First Voices” (Respondent 22, 2009).

Other respondents stated “I thought it was really neat, cause not just having the words on there but being able to hear them I thought was really helpful” (Respondent 35, 2009). “I think it’s awesome, they have a lot of content on there. I am very happy with the information that’s out there” (Respondent 33, 2009).

Overall the responses to the question related to First Voices seem to indicate acceptance of traditional content on the web. One participant indicated that the information published on the Ktunaxa Nation website, First Voices, and Ktunaxamemories was public information and was enthusiastic in explaining the purpose and functionality of each site.

“Any information that’s on the website is safe for anyone to look at, it’s allowed to be public...Some parts of the creation story only Nation members know, the online version is considered to be the condensed version (Participant 5, 2009).

Another project that will affect all Nation sectors and every community office is Groupwise which refers to the newly installed VoIP system (which utilizes fibre from the KNN) that created a Nation intra-network. The Nation offices no longer pay long distance fees between community offices as the calls are essentially made over the internet. The Groupwise software also includes instant messaging (IM), email and a collaborative Nation calendar via the internet. One outcome of this software has been that all communities are now connected with the tribal council. Another aspect of this project that is currently underway is the introduction of a document management server to facilitate the proposed document and information management system that will eventually centralize all Nation documents (both current and historical). Historical documents will be scanned into the system and preserved for future use. Yet another use of the Groupwise system is voicemail messages on office phones can generate an email of the message, in written text, which can be accessed both at home and at work. Generally, study participants were accepting of the internet and computers and were agreeable with using the internet to facilitate in the dissemination of language.

However, six individuals expressed views about the need to remember that

“technology [cannot] replace the face to face, which is part of culture. Technology is not the be all end all. We can put language online but it still doesn’t compare to sitting with an Elder and learning that way....It’s a tool but we shouldn’t rely on it too much” (Interview 11, 2009).

Paradoxically, the individuals that held this view did not believe that face to face learning alone was sufficient, and could see the value of the online courses. In discussing

the current situation of language in the Ktunaxa Nation it seemed that younger children are being taught at home by grandparents, that teenagers (if interested) were learning at high school, and that the remaining Elders speak Ktunaxa fluently. However, individuals between the ages of approximately 25-50 are the target of the online courses, as they were not taught as children.

5.5 Economic Use

The Tobacco Plains band owns both a Saw Mill and a Duty Free shop. One participant reported that online purchases are necessary for both businesses and reported spending approximately two hours per day after dinner searching online for different First Nations products to purchase for resale at the duty free shop (Respondent 10, 2009). Although, neither business are on the KNN at this point, the potential is obvious. The Mills financial affairs are conducted via the Band office which is connected to the KNN. "Before the KNN was in place we would get 'bids' [for lumber] that would take three hours to download, now this is a much easier process" (Respondent 10, 2009).

Currently, the duty free shop is connected through Telus and the Saw Mill does not utilize computers at all. Again, although connectivity capabilities are necessary for both these business online activities are being conducted in residential homes rather than at the business site. Respondent 10, acknowledging the potential, stated

"The Mill doesn't have a computer. Eventually that is something that I would like to have is internet purchasing where...people could go online and purchase our

wood and I would invoice them, and it would be a direct payments to our accounts” (Respondent 10, 2009).

Table 2: Economic Uses as Reported by Participants

ECONOMIC USES AS RERPORTED BY PARTICIPANTS	YES	NO
Online Banking (e.g. Paying Bills Online)	20	11
Ebay	12	19
Purchase or Sell Anything	15	16

Common reasons for not using internet banking or having bought/sold anything online included a lack of trust or not owning a credit card.

Twelve respondents reported that in their opinion the KNN had created economic opportunities in the communities including: online job postings (via the Nation website), jobs created by the learning centers, information related to economic and other grants that can be applied for online, or sent by email. The Bands post information regarding call for proposals for grants (which reportedly comprise a significant portion of operating funds). Additionally, looking online at the Western Economic Diversification website for economic grants to apply for (searching for grants and applying online is now considered common protocol for many government departments), access to powwows.com (a site where First Nations items can be bought, sold, or traded), and lastly a Facebook group has been started to buy/sell and trade children’s toys and books were also reported as economic uses.

Five businesses were identified as having used to internet to promote business. First was the Duty Free shop and Saw Mill discussed earlier. Second was a business called Legend

Logo's located at the Lower Kootenay Band that has a website displaying their merchandise and uses the internet to order merchandise online (Legend Logo's now utilizes the KNN). Band offices were mentioned numerous times as having to purchase a variety of items online including office supplies, books for schools, and other computer related items. One person described advertising their business as a personal guide business (for hunting and tripping) online and utilized email to contact clients.

Respondents reported purchasing or selling the following items online: sports equipment from the US, clothes, concert tickets, vacations, hockey cards, a karate outfit, an iPhone, airline tickets, quads, books, crafting materials, music, movies, computer items, tools, lumber and a horse.

5.6 Educational Use

Three students reported completing their high school courses, or upgrading of high school courses online from the CLCs. One of the communities is currently creating a position within the band for an individual to oversee tests in order to eliminate travel to Cranbrook for tests. Students currently must travel there to have their online test overseen by an individual associated with the school. Another respondent reported taking an online course related to working with families through the College of New Caledonia and stated the importance of a reliable connection to the internet at home to do coursework and submit assignments (Respondent 21, 2009). Twelve people of thirty

indicated that they had never taken an online course and did not intend to. Four of these people reported this was due to the online component.

Commonly discussed uses related to education included use for homework (use of computers, online research), computer courses to learn more about computers, the language courses (n=14), developing an online course (n=1), teaching an online course (n=2), and to communicate for purposes related to education (n=8). Three of the four learning centers (CLCs) were observed to provide internet connected learning environments for school age children that usually attend for approximately one half hour to one hour after school.

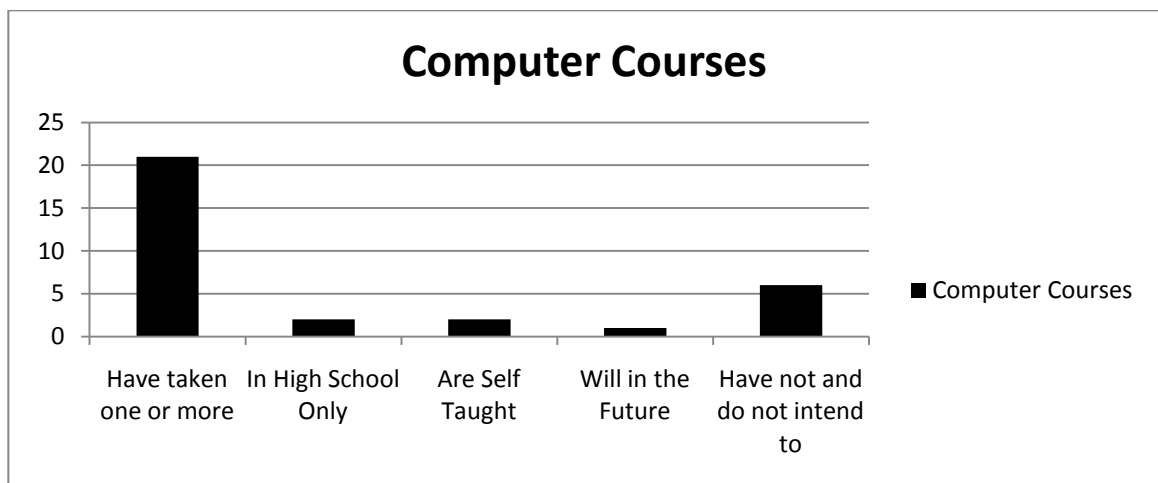


Figure 25: Participant responses Related to Computer Courses

Twenty-one of 27 respondents reported having taken a computer course, related to how to use computers. Two people reported taking computer courses only in high school, and two other reported being self taught. One person was enrolled in a computer course that had not yet started and six people replied having never taken a computer course

and having no interest of doing so in the future. Figure 24 depicts the groups responses related to computer courses.

5.7 Use Related to Health

Responses related to the use of the KNN for health purposes were varied. The only common responses related to searching online for health information. However, respondents cited a number of different searches such as: nutrition (recipes or to post on the community website), diabetes, stroke, and the swine flu. Information to post for the health theme of the month and using Google to input symptoms to discover a potential type of illness was also acquired online.

Additionally, the community nurse or person responsible for the health unit reported retrieving health information for community members such as, information about medication prescribed by doctors, information about medical coverage (non-insured health benefits posts information on what medications are covered), other medical information (specifically certain words or medical terms), and information to send to other health offices.

One project referred to by five respondents was the Community Learning Centers (CLCs) initiative, a partnership between the University of British Columbia's (UBCs) Continuing Medical Education Branch funded by the Canadian Institutes of Health Research (CIHR).

Further investigation (both online research and conversations outside of interviews) revealed that the aim of this project was to connect Elder's health and youth knowledge. This project entailed a community survey in which community members were asked, among other things, to list the health issues most important to them. The most common community identified issues were further researched by young community members employed by the CLC initiative and then posted on the community website. The three most important issues identified were diabetes, stroke, and nutrition. Four of five respondents that identified this project in their interviews as being a use of the KNN related to health were involved with this project directly or were Nation employees, familiar with the website.

One issue related to the CLC health initiative was updating the website. Developed approximately one and a half years ago, the site has not been consistently updated. Those who commented on viewing the site for health information reported a desire for new information to be posted on a regular basis, in order to keep the site current and to keep members interested. Over a period of three months, while this research was being conducted, the second position at the St. Mary's CLC remained open and was being advertised by the Nation. The situation speaks to the need to develop community capacity.

Each Ktunaxa community had a health office that was connected to the internet via the KNN or another provider. Two communities had videoconferencing capabilities that

were utilized to join health meetings in the region (western Canada) and also to attend meetings with Health Canada. Telehealth as described in the chapter two and as being comprised of a telehealth unit, was not being utilized in the Ktunaxa Communities as each community is located within 15 minutes of a municipality and general hospital.

5.8 Social Use

All 31 community member informants reported social uses of computers and the internet. Please see table three.

Table 3: Types of Social Use Indicated by Participants

Type of Social Use	Number of Respondents Reporting Regular Use (n=31)
1) To Communicate with family and friends	29
2) Email	28
3) Chat	19
4) Get News and Weather Information Online	23
5) Get Community News Online	6
6) Play Computer or Online Games	9
7) Facebook	18
8) Video Chat (e.g. Skype, msn live)	7
9) Limewire	4
10) Send large items	6
11) Utube	8
12) Groupwise	11
13) Facebook to Facebook to Facilitate Social Gatherings	6

The number of respondents that confirmed regular use of each item above is indicated in the right hand column. Some respondents were not sure whether or not they had used a particular application, did not know what the application was, or did not want to

confirm their use of an application (e.g. Limewire). The only two items in which a significant majority replied negatively was “to get community news online” and “to play games online.” In reference to the former item most respondents stated being more likely to pick up a hard copy as opposed to reading the news online or printing the email, but also indicated not being against having the community newsletter send out by email. A member of the administrative staff at St. Mary’s Band commented that, overall more newsletters are send out now by email than by regular mail however, this is most likely only the case at St. Mary’s. In reference to the latter item, the researcher felt that a significant few, generally people over 30, felt that playing online games may not seem like a productive use of their KNN or that playing online games was ‘wrong’ or ‘bad’ in some way. Researcher observations suggest that the number listed above may have been higher in reality.

The Facebook application was one of the most adamantly talked about uses, especially by respondents from St. Mary’s Band. Every response related to planning social events via Facebook was from a respondent residing in St. Mary’s. The most unrecognized application was video chat. Many respondents first asked for an explanation of the application then replied they had heard of it (some had seen others use it) but had never used one of the programs themselves.

Of 31 community member informants, 29 responded to the question “Where do you take your computer to have it fixed?” (The other two respondents did not have

computers). Of the 29 respondents, 10 would contact the Nation’s IT worker Ian, seven would take their computer to a friend, family member, or co-worker to have it fixed, six people would take their computer to a business in Creston called ‘Protocol’ (all six that gave this response were from the Lower Kootenay Band, located near Creston, BC.), four people would contact Tom Phillips, one person would fix it themselves, three people indicated they would contact James, Bob or Jesse, one person would contact a private business and one person would throw their computer out.

Thirty out of 31 community member informants are aware of and use anti-virus software either on their work or home computers. The remaining respondent was not responsible for the operation of a computer either at home or at work. Nine use Norton, seven use McAfee, three use AVG, two use Shaw antivirus software, one uses Avast, and eight were unaware of the type of antivirus they were using.

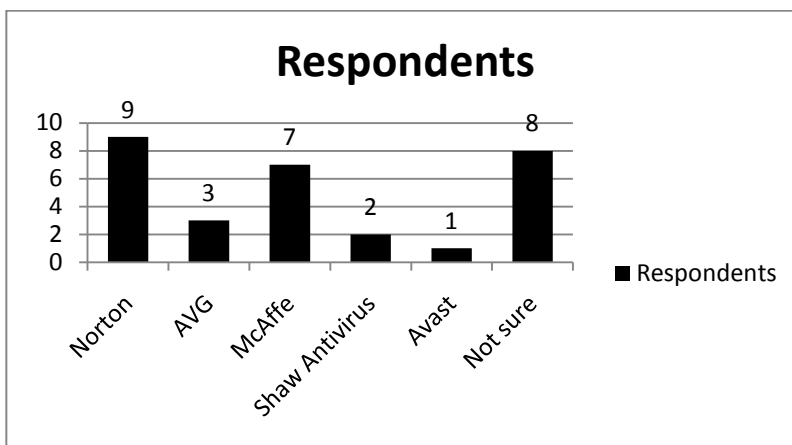


Figure 26: Antivirus Use by Type for Community Member Informants

Of 31 community member informants, 30 responded to the question “Have you ever had to deal with a computer virus”? Of the 30, 18 responded they had dealt with a virus, nine responded they had not, one responded that they did not know, and two

responded that they did not have computers at home. Twenty-two people out of 31 responded to question regarding their use of different internet applications. The results were as follows: 19 use email, 19 use internet browsers, eight had used video chat (for example Skype), nine use chat, 13 use a social networking site (12 of the 13 reported using Facebook), 14 download music, nine send large items, and 17 had visited YouTube.

For those in communities waiting to receive residential connectivity the question of future use is premature. In discussing future uses one participant responded “Just access, a dedicated hook up. No point in talking about future uses or programs until there is a dedicated connection” (Participant 17, 2009).

5.9 Summary

Although the KNN project may not have unfolded smoothly, many secondary projects, of benefit to the Nation, have taken place as a result. The presence of the KNN has enabled multiple projects including both the Community Learning Centers (CLCs) project, inclusion in a SSHRC funded Canada-wide study of social capital and ICT in Aboriginal communities, the First Voices project and the Ktunaxamemories website. There is no doubt the KNN has had a great impact on individuals residing in the Ktunaxa communities. In every area of use (e.g. economic, language) future or potential uses of the KNN have been identified by participants. Generally, those using the network are

excited about future applications and how technology can play a role in meeting the needs of individuals, of each community and of the Nation as a whole.

CHAPTER SIX - Discussion

6.1 Introduction

The findings of this thesis research support the notion that broadband internet can provide positive benefits for remote communities (Haythorthwaite, 2001). Indeed, much of society depends on connectivity and related tools in order to conduct business, communicate, and maintain social contacts. However, the outcomes and uses of connectivity are not always tangible, or in other words, input X does not produce outcome Y. Rather, outcomes are varied and seemingly determined by each specific set of circumstances surrounding the KNN project. Studies suggest (Mignone et al., 2009), that community ownership may be one prerequisite for development a successful, sustainable community ICT network.

The uses of connectivity and ICTs in the Ktunaxa communities have been examined, with a focus on land and language. While the implementation of the Ktunaxa Nation Network (KNN) did not unfold according to plan, the Nation continued and prevailed with the original intention to revitalize language. The College of the Rockies has successfully marketed the online language courses and gained the interest of many Nation members. More advanced courses continue to be developed to meet the needs of students.

6.2 Discussion of Findings

The following section describes the access and use, benefits of access, multi-stakeholder projects, enhancing inter-organizational communication, community ownership, youth and elders, videoconferencing, summary of uses and implications for community capacity building and community development, as related to the KNN.

6.21 Access and Use

The Ktunaxa Network was designed to provide both residential and public access to connectivity and ICTs. Providing such access to internet services in the Ktunaxa communities is underway. The barriers encountered in the process are detailed in the network narrative. The KNN has been described by study participants as being “Built to Fail”. The network narrative describes the challenges and difficulties enduring during network implementation. Telling the story of the KNN was very important because the ability of local community members to access and use the KNN was affected in that access was delayed and in some cases not provided.

During the time at which data was collected, the St. Mary’s Band had full residential connectivity via fibre-to-the-user, a connected health unit, Community Learning Center (CLC), and a connected on-reserve business (St. Eugene Mission Resort) as well as connectivity to band administration offices. Lower Kootenay had full residential

connectivity via fibre to the user, was connected to the KNN in the band office, the school, the health unit, and the CLC. Lower Kootenay differed from the other communities in there had been access to high speed internet prior to the introduction of the KNN via Shaw internet services. So while many individuals reported being connected to and using the internet they may not have been connected to the KNN. Tobacco Plains had wireless connectivity to the KNN at the Band office and in a few residential homes close to the band office but did not have full residential connectivity. Also, in Tobacco Plains the health unit and CLC were both connected to the KNN; and while Akisqnuq did not have residential connectivity, the band officer utilized the KNN (including a computer for public use) and both the health unit and CLC were connected to the KNN. The CLC at Akisqnuq appear to be utilized quite regularly. The Nation is currently working towards the goal of connecting all residential households in the Nation and will, along the way, connect many local municipalities previously without service. The events that occurred during network implementation are considered to have delayed the objective of connecting all Nation households and have caused the Nation to incur unexpected expenses (e.g. court costs) during the period of network implementation.

Community ICTs networks were reported to provide greater access to essential services such as education, training, and health care (Fawcett et al. 2003). The Ktunaxa Nation network provided access to education via programs with the College of the Rockies, the online language programs and many other online educational institutions. Information technology training was provided to CLC coordinators and community youth. Residents

in the Ktunaxa communities could access health information deemed relevant via their local CLC website, as a result of a community survey that took place. Lastly, email was reported as another means of obtaining health information from local health units.

6.22 Benefits of Access

NetworkBC (2005) discussed the potential of community ICT networks to create economic opportunities; a statement affirmed by the Ktunaxa experience in that paid employment was created (the CLC coordinators) and Legend Logos online website is now easily accessible to customers. Beaton (2004) discussed the creation of online Aboriginal networks, another notion affirmed by the response of study participants that named Facebook as their favourite online tool and activity. The Ktunaxa Nation also has their own Facebook page with many members that post (announce) community news and events. Rennie (2006) suggested that connectivity and ICTs could play a role in managing natural resources, another statement confirmed by Nupqu employees and Band land managers by reporting their uses of connectivity and ICTs in relation to land management. Daly (2005) suggested that the ability of broadband to transfer files faster and more efficiently may assist community administration and governance, another notion confirmed by participants employed by the Nation. Liberman (n.d.) discussed connectivity and ICTs as a means through which language could be documented and disseminated. The Ktunaxa Nation exemplifies this in their use of First Voices and the creation of Ktunaxamemories.ca.

Currently, there are many projects in every category of use (land, language, education, social, economic, and health) that utilize connectivity and ICTs. Essentially the provision of internet service creates a more level playing field for Aboriginal communities to interface with other organizations. Access to information and an effective means of communication place small remote communities in a position to participate equally in the areas of governance and business, which has been a longstanding goal of many rural/remote communities. "Many First Nation communities have characteristic problems that could be alleviated by full Internet connections to the larger society and to other First Nations" (Falconer, 2009). Internet can facilitate problem solving and the provision of services (government, health and education). In discussing each area of use, participants identified current uses, uses already planned for the future and ideas around future use that would assist individuals in accomplishing daily tasks and the goals of the Ktunaxa Nation.

The community needs addressed via the introduction of the KNN are numerous.

Potential or future aspects include: justice, home businesses, tourism, and the forthcoming document and information management system. Projects related to land that have future potential include the Geoviewer, discussed earlier, which provides access to Natural Resources Canada information that can be used in land management and treaty negotiations.

6.23 Multi-Stakeholder Projects

The network narrative provided valuable context through which the results of the thesis are considered. This thesis is unable to confirm or discount the statements made in the network narrative. As stated by network narrative participants a structure that defined relationships and provided a system of accountability was lacking throughout the duration of network implementation. The difficulty and resistance encountered during network implementation may have been a result of the lack of structured relationships between First Nations and municipalities in Canada generally. One situation created during the KNN project essentially placed the municipality (used to providing the public goods and services) in conflict with the First Nation. In a sense, the municipality was challenged by the First Nation in an area of service provision of the internet, which formerly resided with the municipality. However, once the First Nation was able to establish a different means through which to achieve connectivity, the municipality should have been on board for the benefit of citizens in the area. The Ktunaxa network is comprised of 14 towers that can provide connectivity to a number of towns and cities in the East Kootenay region where previously municipalities had not been able to provide these services.

The underlying power struggle created by the change in provider of internet service may not have facilitated an environment of collaboration between partners. The unwillingness of local municipalities to work with the First Nation, as described in the

network narrative, point to an environment of discrimination that exists either in the regional area or in the business realm of that area. Systemic discrimination in this case may be addressed by the creation of structured relationships, as suggested previously, but may also be assisted by the solid business portfolio of the Ktunaxa Nation including not only past successes but also that of the Nation network. Additionally, increasing accountability within multi-stakeholder projects may be a task for the federal government, as it is more likely that individuals will act responsibly when other contracts and relationships entice them to do so. Increasing the number of individuals monitoring project progress and the flow of funding would also likely play a role in increasing accountability in multi-stakeholder projects.

6.24 Enhancing Inter-organizational Communication

The strengthening of institutions is evident as the ability of the Bands to communicate with each other and with outside organizations has been increased due to the introduction of the KNN. The crippling effects of dial-up internet had been experienced by many Nation and Band employees prior to the introduction of the network.

Respondents mentioned having attempted to send an email with a large attachment (e.g. a formatted government report or a map) and having to wait a few hours for it to send, if at all. Multiple referrals from various government offices, sometimes regarding the same activity, had resulted in a duplication of efforts and confusion over who is dealing with the referral in the past. Government reporting can be viewed as a main task

for many Band employees as much of the Nations funding comes from government and other grants. Reporting refers to the process of filling out forms (which can now be done online) to report on the status of the grant money and project tasks accomplished to date. The facilitation of organizational and inter-organizational communication is one significant outcome of the KNN project. Generally this notion relates to obtaining equal ability to participate in mainstream economic and government affairs.

In examining the relationship between the use of ICTs and inter-organizational communication, Smith (2008) states that for rural and remote First Nations access to ICTs can level the playing field between small community organizations and large resource development corporations, essentially enhancing the opportunity for equal participation and benefit. In discussing whether or not the internet has had an impact on people in the Ktunaxa communities one participant responded

“I know a lot of people rely on it more for information and news. I guess the internet has sort of opened up a wealth of information, connecting with other indigenous people in the world and other tribes out there” (Participant 11, 2009).

This statement supports the BRAND program outcomes report in which 90% of respondents (BRAND program) stated that internet access had become an essential service (Falconer, 2009).

6.25 Community Ownership

Community ownership played a significant role in the implementation and continued use of the Ktunaxa Nation network. Community ownership stems from the structure of network project funding which is determined by the federal government. The community ownership structure in which funding is provided directly to the community, enables community project managers to design their network in a way that matches predetermined community needs. This can be considered a bottom-up approach in that the community is provided with the opportunity to discover 1) what community needs can be met via broadband connectivity, 2) the best method of meeting those needs with the funding available, 3) technically, what type of network infrastructure would be most useful or appropriate in meeting predetermined community needs (e.g. fibre to the user, WiFi, WiMax etc.), and finally, 4) how to utilize the network and decide which ICTs will optimize network use. In choosing ICTs and other tools, communities must consider whether there is more value in purchasing many older computers or a few new computers, which may depend on both network speed and accessibility of connectivity in the community and in residential homes. Other considerations might include whether GIS and other large information systems are appropriate for the network or whether the communities would benefit from a VoIP telephone system. There are many considerations in designing an internet network.

The alternative funding structure, which has been utilized by government in the past, is to provide funding to the company that develops infrastructure (for example, WCOM in the network narrative). In this case the community must present a proposal to the infrastructure company, requesting the company build their proposed network. This approach can be thought of as a top-down approach in which the community in many senses is powerless to design their network in a manner that meets community needs. Further, community needs are often not assessed when funding is structured this way, as the outcome (a statement of community needs addressed by providing connectivity) does not assist the community in having their proposal approved by the infrastructure provider. Essentially, this model does not enable communities to design a project to meet community needs, does not engage local people, and has not, in the past, resulted in the creation of a sustainable network.

Additionally, community ownership of the network is significant because rural or remote internet services are utilized differently than in urban centers. The provision of service in urban centers utilizes a business model based on economies of scale. In other words, companies that develop and offer internet services in urban centers can expect a certain return on their investment and can expect to be profitable. In rural communities service provision is not based solely on a business model, and initial costs such as for establishing backbone infrastructure must be subsidized because economies of scale do not exist in the region. Service provision in Aboriginal communities generally goes beyond simply providing an internet connection to residential homes, usually including

other services such as access to a learning center and trained individual that can assist residents in learning how to use computers and the internet. Other services such as community workshops are also common.

Had the Ktunaxa Nation not owned their network project and had dedicated individuals actively working to ensure network objectives were met, one can speculate that connectivity in the Ktunaxa communities would not exist today, or in the near future. The network narrative and related events highlight the importance of community ownership. However, improvements should be made to the community ownership structure such as defining the roles, relationships, and responsibilities of all parties involved. Defining relationships ahead of time may facilitate cooperation throughout the project. Requiring partnerships, as a condition of funding, between First Nation communities, infrastructure developers, municipalities and other entities without a common goal and understanding of the role of each party does not benefit individuals involved in the process or the communities slated to become connected (Mataer, 2002). Rather, positive relationships likely result from a common goal and understanding between all parties involved. Network projects enabled by government funding may benefit from the establishment of a system of accountability to government to which all parties are held. Lastly, developing a process of procedures that detail how to implement actions for recourse should be determined prior to the commencement of the project.

Other aspects of community ownership that are of potential significance include the employment of local individuals in the Ktunaxa communities as community learning center (CLC) coordinators. These positions assisted the project in meeting its goals in a number of ways. Paid positions within the communities were acquired and residents became aware of the CLCs via a health project in which the coordinator and assistant interviewed local individuals about access to health information online. This aspect highlights the public utility of community based networks in that local benefits are procured, as was reported by Finkelievich & Kisilevsky (2005) in discussing the ability of the telecommunications community cooperative in Pinamar, Argentina to provide external local benefits.

The KNN is a government subsidized business venture that enables both First Nation communities and other small municipalities in the area to have access to connectivity services at a reasonable price.

“Once broadband access is available in a remote community, at reasonable costs to its residents, the benefits are strongly felt. In a final assessment of the recently concluded BRAND program, the response of users in remote and rural communities was overwhelmingly positive. Ninety per cent of the programs recipients indicate that broadband access was essential and that there would be adverse impacts on their communities if services were withdrawn” (Falconer, 2009).

The network would not have been economically efficient without the original grant as connectivity infrastructure is extremely expensive and economies of scale do not exist in this region. Today, after the hurdles of network implementation, the KNN provides consistent quality service. Government subsidized services, such as public infrastructure

(community ICT network), are not uncommon in Canada and simply denote a service recognized to provide community benefits and warrant additional financial supports. Language dissemination is an example of this, as intangibles such as language cannot be monetarily valued.

6.26 Youth and Elders

The use of connectivity and ICTs in the Ktunaxa communities is currently underway and consistently expanding. Land and/or language projects that utilize the internet and other ICTs may act as a bridge between youth and tradition by promoting the project using mainstream media (e.g. the internet and related tools including First Voices, Facebook etc). When the internet and ICTs are used as a venue for the promotion of culture, youth may consequently develop stronger community ties and links to tradition and promote Aboriginal culture within the larger context of today's society. Other identified uses related to both land and language which promote a connection between youth and Elders include combining the two groups in using computers and the internet, which is often the case not just between youth and Elders, but also between youth and their parents. Figure 27 indicates the interests of each group (youth and Elders) and how those interests can be combined to engage youth and Elders in land and/or language initiatives that involve connectivity and ICTs.

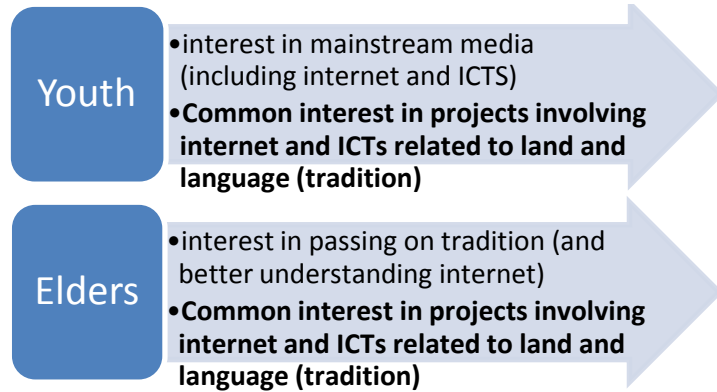


Figure 27: Illustration of Youth and Elder Common Interest in Internet/ICT.

Additionally, youth migration was mentioned previously as an issue facing Aboriginal communities today. Many youth have been drawn to urban centers as a result of employment and educational opportunities. The introduction of the KNN increased the opportunities for both employment (via the CLCs) and education (access to online courses) in the Ktunaxa communities. Full time positions were created in each learning center in which each employee engaged in further training such as website development in a health context, and weekly videoconferencing meetings to share their experiences and promote each center (Participant 57, 2009). Many internet based educational organizations (e.g. Athabasca University) in Canada can now be accessed by those residing in the Ktunaxa communities. Additional research is required to determine whether access might play a role in reducing youth out-migration and increasing youth participation in mainstream society and opportunities.

6.27 Videoconferencing

A significant number of respondents showed interest in, or had used, videoconferencing capabilities and many respondents noted how this tool can be used to avoid travel between the Ktunaxa Nation communities for meetings. One of the outcomes of increased usage of videoconferencing capabilities may be a small but significant reduction in green house gases. The Nation offices are mainly located in Cranbrook and at St. Mary's which results in frequent travel for some individuals. However, several participants mentioned having to travel other communities; and although travel seems to occur in every direction, the St. Mary's community is somewhat of a focal point or hub within the Nation. Participants employed in the area of health had utilized videoconferencing capabilities to attend meetings with the Interior Health of British Columbia and other health related conferences in Vancouver.

6.28 Summary of Uses

Main or highlighted uses in each area include; *Land*: the ability to utilize GIS capabilities in the communities which may increase collaborative projects between communities and the different Nation sectors; *Language*: the online dissemination of language enables current and future generations of Ktunaxa people to learn their traditional language; *Social*: the social uses of connectivity and ICTs are endless and act as a foundation to enable other types of use; *Education*: access to online courses and

programs provide a wide range of opportunities previously unavailable to those without connectivity; *Health*: the community health survey conducted by CLC employees examined health information relevant to Nation members and used the community webpage to disseminate this information, accessible to community members as a result of the KNN; *Economy*: the network in itself is an economic initiative that will diversify the Nations business portfolio and add to their current list of successes. Other economic outcomes of the network project include the creation of paid jobs in each learning center.

Access to connectivity and ICTs has and will continue to play a major role in both the Ktunaxa communities Nation. Residential and public access to connectivity equates to increased opportunities in education and for participation in mainstream culture and the development of indigenous cultural content online (e.g. Ktunaxamemories.ca).

6.3 Implications for Community Capacity Building and Community Development

One significant outcome of the KNN project has been an increase in both individual and community capacity. This increase is evident in the data, namely in that employment opportunities were created, community space was utilized for the project, training workshops were held, the online language programs received great participation and support, and lastly individuals made the decision to *learn* in order to utilize the network. Capacity has been increased in individuals that received formal training and also in those

who made the effort to better understand and utilize computers and the internet to further their knowledge and capabilities. Community capacity has been increased as a result of the efforts of local individuals working toward the common goal of engaging community members in the use of internet and ICTs. Although the Nation may not have been fully prepared to take on the unexpected challenges associated with network implementation, capacity related to connectivity and ICT has been built in the communities and in the Nation as a result of the project. Additionally, the capacity of the Nation to engage with and be successful in multiple stakeholder projects has been increased. The experience gained as a result of this project has created capacity and better prepares the Nation for future projects and challenges.

Connectivity and internet are tools that can be utilized by individuals to enhance the ease by which a task is completed, to create opportunities and further livelihood outcomes, or to revitalize language and tradition. In order to understand the current state of connectivity in each Ktunaxa community it was necessary to develop the Network Narrative. Community members that have not yet received connectivity in their homes are ready and expectant and have already begun to utilize the internet and other tools in band offices and learning centers. Additionally, the general feeling throughout the Nation seems to be one of anticipated success for the KNN project.

In the western world, one result of the introduction of the internet has been the digital divide. Whether the digital divide should be classified as a new inequality or simply as

yet another extension of pre-existing inequalities is a question yet to be answered. The argument could be made that rural, remote and Aboriginal communities have continually been the last to receive access to new technology and that broadband is no exception. However, as the Government of Canada has recognized, the current social problems experienced in many Aboriginal communities are likely the result of a legacy of historical policies of displacement and assimilation (The Royal Commission on Aboriginal Peoples, 1996). Today, new policies that promote healing and focus on the future are needed and should promote equality in access to the internet, health care services, educational services and economic opportunities as is the case for individuals in urban centers. The argument can be made that today telecommunications are a necessary service such as road construction, rather than a luxury such as satellite television. Telecommunications may potentially provide access to additional health care, education and economic opportunities in rural remote communities, reducing the current disparities that exist (rural/remote vs urban) in access to services. Universal access to information is a long standing idea that becomes more complicated as the way we, as a society, change how we access and exchange information.

6.4 Policy Implications

The Canadian Radio Television and Telecommunications Commission (CRTC) regulations have changed over the past decade as a result of the efforts of individuals associated with a rural, remote community ICT network called K-Net, in north western Ontario. The

introduction of telecommunications, specifically the internet, and related tools in mainstream society have impacted rural, remote and northern communities (many of which are Aboriginal) by increasing the disparities between these localities and that of urban centers. This has been the case with the introduction of most new technologies historically. The disparities created have been acknowledged and addressed (to some extent) by the CRTC as a result of a process initiated by individuals representing K-Net. The CRTC regulates and supervises telecommunications within Canada via the Telecommunications Act (1993) which “ensure[s] that Canadians have access to reliable telephone and other telecommunications services at affordable prices” (CRTC 2008). Ideally, the provision of services in rural and remote areas should be mandatory to ensure that no rural/urban gap in services exists. However, what is written in policy is often not the case in reality, as is evidenced by this research. Rural communities historically receive new technologies much later than urban centers, receive a lower quality of service and/or are required to pay substantially higher prices as compared with urban centers. Today as a result of the efforts of the K-Net group the CRTC requires that large telecommunications companies such as Bell provide services not only in urban centers but also in high cost service areas.

Ultimately the provision of broadband connectivity should be considered a necessity rather than a luxury within Canada. This may seem like a frivolous statement however, the result of considering broadband a necessity would be most meaningful for those in rural and remote communities. Internet services are available in all urban centers in

Canada, as 85% of the Canadian population resides in ten major urban centers located within 100 kilometres of the American border. The federal government continues to fund inventive projects to bring connectivity to the hinterlands. Establishing broadband service provision as a necessary service may increase innovative applications to established funding programs thereby creating an inspiring environment for future projects and increased recognition of the benefits of community ICT networks.

The provision of broadband connectivity in rural, remote, northern and Aboriginal communities was a policy promise under the Canadian Liberals who were in Parliament prior to Stephen Harper's Conservatives. The last liberal government recognized (acknowledged via multiple funding projects including BRAND, NSI, and CAP) the potential of community ICT networks to enable community development and community capacity building, as well as the role internet access may play in achieving livelihood goals and reducing the gap in equality between rural and urban individuals and communities. One of the previous federal programs that provided funding for broadband was Broadband for Rural and Northern Development (BRAND) which funded many First Nations communities and had a significant impact on the rural/urban divide. Established in 2001, the BRAND program was utilized by "900 communities...which decreased the proportion of unserved communities from about three quarters in 2001 to a little more than one third (37%) in 2006" (Falconer, 2009). Steps are being taken today by the Federal Government that signify that the benefits of rural and remote broadband continue to be acknowledged and warrant government subsidization.

Funding for broadband connectivity in rural communities is now part of Canada's Economic Action Plan. "As part of Canada's Economic Action Plan, the Harper government is investing \$225 million over three years for Industry Canada to develop and implement a strategy to extend and improve broadband coverage" (Government of Canada, 2009). The press release dated July 30, 2009 called for applicants that can provide low-cost coverage, create employment opportunities, "deliver within a set timeframe, and ensure a viable and sustainable business model for the future" (Government of Canada, 2009). The first round of successful applicants was to be selected in December of 2009. The increase in the federal commitment to providing connectivity services is likely due to the success of the previous BRAND program through which 90 million dollars were used to fund community ICT network projects.

CHAPTER SEVEN - Summary, Conclusions, and Recommendations

7.1 Summary

The primary purpose of this research was to explore the uses of the Ktunaxa Nation Network (KNN) with a focus on uses related to land and language and to investigate the uses of the network at an organizational level. Semi-structured interviews were conducted in the four Ktunaxa communities (St. Mary's Band, Akisqnuq First Nation, Lower Kootenay Band, and Tobacco Plains Band) involved in the KNN project. As is the case with many research projects, the reality of any given situation is often different than in written documentation. Throughout the interviews the challenges and struggles associated with network implementation became evident and led to the creation of the network narrative. However, the Ktunaxa have had great successes related to their project objectives, despite the struggles associated with network implementation. Further, the value of preserving a dying language and enabling a more level playing field at the organizational level cannot be valued monetarily and will benefit both the current and the next generation.

The review of literature informed the development of a semi structured interview guide. The research was governed by both the Human Ethics Committee at the University of Manitoba and the Researcher Ethics Guide of the Ktunaxa Nation. The case description of the KNN provided context through which the results of the current study should be

understood. The restorying method was utilized to shape individual experiences related to network implementation into one comprehensive sequential account of how the KNN came to be (Ollerenshaw & Creswell, 2002). The data related to land and language uses were discussed in comparison to the other community ICT projects and future Ktunaxa projects.

7.2 Conclusions

The KNN project began at the proposal stage in 2001 and as of March 2010 had connected all four Ktunaxa communities and 31 unincorporated communities in the East Kootenay region. The following are conclusions that stem from the thesis research.

7.21 Examining Community Connectivity

This research revealed that connectivity differs in each of the Ktuanxa communities and was negatively affected by the events surrounding network implementation (see Chapter 4: Network Narrative). Key stakeholders reported that the goal of the KNN was to connect all Nation homes to the internet. All Nation homes had not been connected at the time of data collection (summer 2009); some only had access to connectivity via the Community Learning Center (CLC) or the band office. The KNN was designed to be a profitable business venture and the Ktunaxa Nation is on their way to reaching this goal.

7.22 Uses of the Network Related with a focus on Land and Language

The main uses of the KNN by local people were overwhelmingly social, following the patterns of adoption discussed in chapter two. The literature discussing the adoption of new technology states that most users (not including those with a hobbyist interest) first begin to use internet and ICTs for social reasons, e.g. to communicate with friends and family. The initial use presumably creates a foundation that has the potential to foster other types of use. An example of this might be an individual who learns to type and email in order to communicate his son who resides in southern BC, while working in the Yukon. Other skills related to the this type of use include web browsing, sending and receiving information, understanding how to connect to a wireless network, and creating online profiles.

The most commonly reported use of the network related to land was the traditional land use and occupancy studies conducted at St. Mary's which defined traditional and current hunting, trapping and berry picking sites as well as areas with spiritual significance.

Using GIS mapping to mark these areas enables the nation to continue with future plans for housing and business and also creates a cultural record, now digitally archived for current use and use by future generations. Using the internet and email in the management of land is a common practice in urban centers, and is rapidly becoming a necessity for resource managers in rural, remote communities. Access to the internet and email in rural areas and Aboriginal communities enables equitable participation and

in some ways levels the playing field between governments or large resource developers and small rural communities. Future uses related to land might include the integration of online land management programs such as Geoconnections and the Geoviewer that can be utilized by both Nation employees and community members to meet various objectives. Other future uses might include the development of interactive websites for youth and additional land use and occupancy studies at St. Mary's and the other communities to facilitate decision making and to assist with land claim negotiations.

The KNN was originally conceived as means through which to disseminate language via the internet. The most commonly reported uses of the network related to language were the Ktunaxa 101 and 102 online courses, and First Voices. First Voices is an online resource which enables users to hear the Ktunaxa language spoken by elders. Both are well developed and are being utilized in the local high school in Cranbrook, in community learning centers and in residential homes. Ktunaxa is a language isolate, meaning that it is one of a kind and unrelated to any other language in the world. The Ktunaxa people have taken the initiative to combine the existing knowledge passed down from elders and apply it to modern technology, to ensure that the language survives. Having the ability to disseminate language throughout the Ktunaxa communities has always been the central objective of the broadband network. The KNN has enabled the process of language preservation to continue. Currently there are twenty-four speakers left. Language recordings have been digitized and shaped as online

courses that utilize First Voices as a tool for learning. The Nation now has a method through which to disseminate the Ktunaxa language to current and future generations.

In discussing the role of technology in language preservation, most participants expressed support for the Ktunaxa 101 and 102 online language courses. Those that felt face to face teaching was superior in method also acknowledged that the internet was necessary for dissemination and retention due to small number of fluent Ktunaxa speakers that remain. Participants that had not taken the newly created Ktunaxa 101 online class reported interest in taking the course in the future. Multiple respondents reported that more advanced online language courses were currently being developed and were in high demand. One respondent stated that the Nation was not able to develop courses fast enough for all the interested learners! The extent to which Nation members and others are motivated to utilize this technology is evident. Both uses related to land and language, as well as in other areas of use, are expected to continue to expand with time and as the KNN develops. Further, as more community members become proficient with computers and other ICTs the number of skilled individuals and the community capacity will increase.

Utilizing internet and ICTs for projects related to land and language show the intention of the Ktunaxa Nation to preserve their traditional language and culture while utilizing modern technology to engage mainstream society, on their own terms. Participants

employed by nation reported plans to continue to develop their capacity related to connectivity and ICTs and will be utilizing new tools for Nation projects in the future.

7.23 Community and Organizational Level Use

The KNN is being utilized by the Nation for both internal and external communications. Each band office is now better able to communicate with the Nation offices and with each other as result of the Groupwise system. Also, both the Bands and the Nation are better able to communicate effectively with government and other organizations. As an example, the Nupqu corporation must communicate with the bands, the Nation, the government and private enterprise on a regular basis. Nupqu is now on the broadband KNN and can send large files easily, enabling efficient communication with governments and resource developers.

Nation employees frequently reported the new VoIP system, Groupwise, as one of the more recent benefits of the KNN. The system connects all four band administration offices with the Nation offices and each Nation sector. An interactive calendar provides access to all employees schedules, which assists with planning, setting meetings, and knowing when to reach busy people. Groupwise enables four digit dialling, has eliminated long distance fees between the communities, and includes instant messaging for all Nation employees. The Groupwise system can be thought of as increasing the ability of employees to communicate with each other and also as creating an increased

capacity within the communities to communicate and work more efficiently and effectively.

The KNN has enabled many additional projects related to technology including the Community Learning Centers (CLCs), which are located in each of the four Ktunaxa communities, and provide access to the internet and other tools. Community members of all ages visit the CLCs for a variety of reasons including to surf the internet, do homework, search for health related information, and to complete online courses. The KNN is community owned and locally operated, which means network profits can eventually be reinvested in the Nation.

Reducing the digital divide in Canada may reduce other inequalities as well, potentially including access to government services, health services and educational programming.

“It is clear that extending full (broadband) internet access to remote regions is an essential means to ensure equal economic, social and cultural opportunities everywhere. It is also clear that there is little economic incentive for private sector vendors alone to extend their networks to these areas. Public sector funding must play a major role” (Falconer, 2009).

7.3 Recommendations for Future Research and for Canadian Policy

The following are recommendations that flow from this thesis work. First, the internet and ICTs offer a unique opportunity for Indigenous people to archive and digitize traditional language and culture for online dissemination. These initiatives enable community members to indicate what content they want on the web, at what security

level and with whom the information will be shared with. Initiatives related to online language dissemination should continue to be supported and further developed.

Second, the government of Canada should continue to fund community broadband initiatives but should re-evaluate or construct guidelines as to how communities, municipalities, NGO's and private enterprises relate to each other in multi-stakeholder projects. Defining roles, responsibilities, and relationships ahead of time may provide a smooth path for other First Nations engaging in the process of network implementation.

Third, the Nation should support the CLCs, provide funds to train local individuals and for learning center employees. Once training has been provided a snowball effect takes place in which friends and family of that person increase their own skills and knowledge related to computers and the internet.

The data collected for this thesis shows that new adopters of computers and the internet tend to use the technology at first for social purposes, for example to communicate with friends and family. In many cases individuals are actually learning how to use computers and the internet from friends and/or family members. A fifth recommendation is for Nation project managers of future initiatives to consider initially contacting or engaging individuals via facebook or some other social networking platform. Nation employees stated that engaging community members in community projects had been difficult in the past. Creating a Ktunaxa communities gateway that provides information regarding current community initiatives and contact information may entice individuals to become involved and would provide a new line of

communication and information exchange between the Nation and community members.

Future research might include impact assessments that report the changes that take place within a community or communities after the introduction of internet infrastructure. Baseline data detailing the skills and technological interest of local individuals prior to the introduction of a community ICT network would enable later comparison that produces evidence of impact data. However, taking account at any point of individual uses of and feelings about technology may provide a platform for comparison in the future. This type of research may assist communities in obtaining additional project and program funding. Lastly, in many cases baseline data has not been collected prior to the introduction of the broadband network resulting in an inability to assess impact.

The Government of Canada, under the Liberal Party, provided project funding directly to the community to receive internet infrastructure. The flow of funding should continue in this manner, as opposed to other funding structures in which funds flow from the government to the project management company (the entity that contracts infrastructure builders, equipment etc.). Providing funding to the community enables a stronger foundation from which to request that services be provided in a manner that meets the needs of community members and satisfies the overall objectives of a community ICT network. However, contractual documents that delineate each parties

role and responsibilities should be developed by the government of Canada, specifying avenues through which recourse can be sought, should the need arise. Experiences regarding the contracting of ISPs and management companies should be documented to provide models and best practices to communities entering the process.

Additionally, although the benefits of a network community champion are well documented by the Government of Canada, this information might be provided to new entrants. The community champion may be employed as a local technician; a local person trained to troubleshoot computer and internet problems that can in turn assist other community members. There is an obvious learning curve for the use of computers and the internet; assistance should be provided during that phase of technological adoption.

The notion that the Nation network cannot be marketed as being associated with First Nations is a sad statement of Canadian Aboriginal affairs. Today, the KNN is a successful initiative that continues to grow and now provides internet services to all four Ktunaxa communities and 31 unincorporated local communities in the East Kootenay area.

Advertising the collective successes of First Nation businesses related to community ICT may reduce the friction between First Nations and municipalities, and also provide a track record of successful ventures (an integral aspect in business relationships generally.) Many of the community ICT projects in Canada have met with great success. A collection of those successes may prove to support Aboriginal business and promote

future partnerships between various levels of government, private enterprises, and First Nations.

Lastly, a recommendation to network administrators and the Ktunaxa Nation is to continue with the current business plans to increase revenues and continue to build the existing network. The KNN project has already succeeded despite multiple challenges and is predicted to continue to do so in the future, as the network holds a license to a valuable service that is in demand in the East Kootenay's. Increased competition between providers is desirable throughout Canada in order to improve the quality of and options for services that regional monopolies may not provide. Respondents indicated a great deal of support for the KNN and believe in the continued success of this business. Additionally, the success of the KNN may provide an example or experience from which other communities can build on in making a case for service provision to the CRTC.

Land and language are of particular interest to Aboriginal communities, especially to those engaging in community ICT projects as these two components are deeply embedded in Aboriginal culture. The fact that broadband initiatives in Aboriginal communities are government subsidized is deliberate, and may be perceived as an attempt to rectify the negative experiences and outcomes of past policies of displacement and assimilation.

The Ktunaxa have embraced connectivity and ICTs to meet the goals of the Nation and to enhance the quality of life for community members by providing access to the many opportunities of the internet and related tools. The Ktunaxa experience can serve as both a model of best practices related to the uses of the network, and also as a precaution to other First Nations beginning the process of internet network implementation.

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ATTACHMENT ONE – CERTIFICATE OF ETHICS

AUG-10-2009(MON) 11:13 HUMAN

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APPROVAL CERTIFICATE

27 February 2009

TO: Heather Henley (Advisor I. Davidson-Hunt)
Principal Investigator

FROM: Wayne Taylor, Chair
Joint-Faculty Research Ethics Board (JFREB)

Re: Protocol #J2009:026
"Exploring the Uses of Connectivity and Information and
Communication Technologies: The Ktunaxa Nation Network"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement. This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- if you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to Eveline Saurette in the Office of Research Services, (fax 261-0325, phone 480-1409), including the Sponsor name, before your account can be opened.
- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval: otherwise the account will be locked.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/ors/ethics/ors_ethics_human_REB_forms_guidelines.html) in order to be in compliance with Tri-Council Guidelines.

Bringing Research to Life

ATTACHMENT TWO – SEMI-STRUCTURED INTERVIEW GUIDE

Introduction

1. Summary of the project with my contact information: provided verbally and in writing
2. Discussion of confidentiality: presentation of consent form
3. Ask permission to tape record the interview to provide notes only

Icebreaker: Can you tell me what you have heard about the nation network or about any experiences you have had with the nation network?

1. How long have you lived in the community for?

Are you a band member?

2. Do you have access to the internet now?

In your home?

3. Where do you use the internet?

-At home, at work, at school, at a CAC (community access center), when you travel, any Others?

4. Where do you use the internet most often?

-At home, at work, at school, at a CAC (community access center), when you travel, any Others?

5. In your family, who uses the internet and computers the most?

-where? For what?

-who teaches who?

6. Are there any groups in your community that use the internet and computers more than others?

-teenagers? Adults? Elders? Kids?

7. Do you use the internet and broadband ...for individual and personal use?

-For school work and related assignments? (take online courses?)

-To do your job as an employee?

-To run my own business?

-Any others?

Traditional Knowledge and Language

8. Have you used the internet to communicate with friends and family?

-for example, with email, msn, yahoo chat, skype?

-in the Ktunaxa language?

-What computer or internet tools did you use to do this?

9. Have you visited the FirstVoices website?

-What did you like or dislike about it?

-Did you use any of the online language tools/games?

-(If yes, which ones?)

10. Have you used the internet to share cultural knowledge?

-for example, the Ktunaxa Creation Story can be seen on the Nation website, traditional ecological knowledge, or related to traditional activities?

11. Are there any other ways the internet is being used related to language and culture?

Social Sector

12. Have you used the internet to get news and weather information?

13. Is there community news online?

-do you think this is useful? Do you read it often?

-what type of information does it include?

14. Are there any popular computer or online games that people like to play?

15. Are there any other ways the internet is being used for communication or social purposes?

16. Is the Ktunaxa Network being used for education?

-are people doing homework on the computer?

-are there any online courses available?

-if no ask, if there were is that something you would interested in?

-are there other types of classes you would like to see available online?

17. Is the Ktunaxa Network being used for health?

-how is it being used?

-what is your experiences with this type of health provision?

-do you find this to be a useful service?

- are there any aspects you especially like about the services being offered? Or would like to change?

Lands and Resources

18. Have you used the internet to visit the website of the Ktunaxa Nation lands and resources agency?

-what was your experience using the website?

-did you find the information provided online useful?

-is there other information you would like to see provided on this site?

19. Do you know of any ways that computers and internet are being used by the lands and resources agency?

-If yes,

How do computers and the internet facilitate mapping?

-GIS?

-Ethnobotany?

-Fire Ecology?

-to record traditional land uses and practices?

-Sustainable development?

-Any others?

20. Do you think computers and the internet have helped people working for the Ktunaxa Nation to communicate better?

-more efficiently, quickly?

-with regional or national governments, and other organizations?

(for example, by increasing the ability to send and receive large files, to have greater access to information, more quickly)

-has having better access to the internet improved communications abilities in this sector?

21. Are there any other ways you know of, or would like to see, the internet and computers being used by the lands and resources sector?

Economic Investment

22. Have used the internet for personal banking?

-If yes... for you do you prefer to do banking online or in person?

-do you know of any businesses in the communities that might access the internet to buy or sell products? Or do any banking?

23. Have you or other you know used the internet to buy or sell anything? for example like on e-bay or online shopping?

-Is this something that would be of interest to you in the future?

24. How has the internet been used to create economic opportunities in the communities?

-Are there other ways you would like to see it used for this purpose?

-Are any businesses benefitting from having greater access to the internet?

25. Have you ever, or do you know anyone, who has found out about local employment using the internet?

-do people use the internet for job hunting in the area?

General

26. What internet tools do you use?

Email (hotmail, yahoo etc.)

Web surfing (Explorer, Mozilla Firefox)

2-way video on the internet (Skype, MSN etc.)

Chatting (msn, etc)

Personal web page (Myspace, Facebook etc)

Downloading music (limewire, I-Tunes etc)

Multi point audioconference (Skype, go to meeting)

Sending large items (videos, maps)

Watching streamed video (webcasts)

Online document sharing (Google Docs)

Any others?

27. Are there other ways you would like to use the internet?

-Or computer and internet tools or applications you would like to have available to you?

28. Do you have current antivirus software such as Norton installed on your computer?

-what type?

-do you find that it works? (keeps your computer free from viruses?)

29. If you have a problem with your computer what do you do?

-do you have friends or family look at it?

-take it to a store?

-are there many businesses close by that will do this? Is it expensive?

30. Have you noticed any changes in people, or in the community generally, related to the Ktunaxa Nation Network?

-people using computers a lot? Too much?

-people meeting at community access centers?

-talking and communicating more or less?

31. Have you completed any computer skills training programs?

-other skills development programs? (A + training?)

-would you like to?

-do you think people are interested in computer training programs? Or other types of training programs?

32. Which TWO uses of the internet are most important to you?

Exploring the Uses of Connectivity and Information and Communications Technologies:
The Ktunaxa Nation Network in British Columbia, Canada

Additional Information Sheet

Interview No. _____

Please circle the appropriate answer:

1) Age: 16-20 21-25 26-30 31-35 36-40
41-45 46-50 51-55 56-60 61-65 66-70
71-75 76-80 81+

2) Gender: Male Female

3) Band Member? Yes No

4) Workforce Status:

a) Employed – Current Occupation

b) Not currently in the workforce

specify: _____

c) Student

d) Unpaid work

specify: _____

specify: _____

Please add any additional comments you would like to make here:

If you would like to be formally recognized in the study report, please provide your name below (please print).

If you would like the final report to be sent to you by mail or email please provide your information below.

Do you know of anyone else I could contact that might be interested in participating in this study?

A draw for a Nintendo Wii will be held June 2009.

Thank you for participating in the study!!!!!!

If you would like to enter your name in a draw for a Nintendo Wii please fill out the form below.

Name: _____

Contact Information: _____

What time is best to contact you: AM / PM

The Draw will be Held on April ____, 2009.

ATTACHMENT THREE – Ktunaxa Nations Code of Ethics for Researchers

Code of Ethics for Researchers Conducting Research concerning the Ktunaxa Nation
Ktunaxa Nation's Code of Ethics for Research
(adopted November 1998)

PURPOSE

1. The purpose of this Code is to ensure that, in all research that involves or relates to the Ktunaxa Nation, the Ktunaxa Nation is able to protect its people, culture and history and to ensure that appropriate respect is given to them.

APPLICATION

2. This Code applies to all persons conducting research projects that relate to the Ktunaxa Nation, including its treaty negotiations, who wish to consult with members of the Ktunaxa Nation and use their oral history, cultural heritage resources, the Traditional Use Study Library, the Ktunaxa Nation archives or other cultural information. This Code applies equally to researchers working on behalf of the Ktunaxa Treaty Council and to those working for other groups, agencies or organizations both within and outside the Ktunaxa Nation.

PRINCIPLES

3. Researchers must familiarize themselves with the Ktunaxa Nation Council (KNC), the Ktunaxa Treaty Council, the Elders Group and the KNC's member bands and observe their respective governing rules and protocols concerning communications within the community, such as approaches required to access the relevant information and knowledge.

4. All requests for information, use of cultural heritage resources, use of the Traditional Use Study Library and the KNC library, resources and interviews with community members or groups must be addressed in writing to the Ktunaxa Treaty Council Administrator or another individual designated by the Ktunaxa Treaty Council. The request must set out the aims, scope and anticipated results of the research project, including the potential impacts and any possible risks. The Administrator or other designated individual will provide details of the request to the Elders Group, the Ktunaxa Treaty Council, the KNC and any other appropriate group or person for their review. After receiving any comments and advice from the Ktunaxa Treaty Council, the KNC and any other group or person who has been requested to provide advice, the Elders Group will approve or deny the request. (Note: Cultural heritage resources include moveable heritage resources, sacred or heritage sites and documentary heritage resources.)

5. If approval is given by the Elders Group for the research project to proceed, researchers must consult with the Elders Group and any other groups or individuals which the Elders Group directs them to contact in order to determine who are the appropriate community members or groups to approach for the particular types of information being sought.
6. After consulting with the Elders Group and anyone else that the Elders Group has directed them to contact, researchers may approach individual community members or groups for interviews. Where researchers intend to interview an individual or group, they must provide them with information about the purpose and nature of the research activities, including the potential impacts and any possible risks, prior to seeking their consent. No individual may be interviewed alone or as part of a group unless that individual has given his or her informed consent.
7. Where appropriate, researchers must ensure that a representative cross-section of community experiences and perceptions is included in their research.
8. Researchers have an obligation to inform participants that they have the right to indicate that some or all of the information they are providing is to be treated as confidential. If a participant indicates that certain information is to be treated as confidential, the researcher must request that the participant identify the purposes, if any, for which that information may be used.
9. Researchers must abide by any requests for confidentiality made to them by participants.
10. No pressure may be applied to induce participation in research.

Participants must be informed that they are free to withdraw from the research at any time.

Researchers must fairly compensate participants by providing suitable financial honoraria and reimbursing any of the participants' expenses.

13. Researchers must give credit in their research report to all participants.
14. Researchers have an obligation to assess the potential impacts on and any possible risks of the project to the Ktunaxa Nation or its members and to inform the Elders Group, the Ktunaxa Treaty Council and the KNC of those impacts and risks. Wherever possible, conflicts between interests within the community must be identified and resolved in advance of commencing the project.

15. Research must support, to the extent possible, the transfer of skills to individuals in the community and increase the capacity of the community to manage its own research.

RESEARCH RESULTS

16. Researchers have an obligation to provide the Elders Group, the Ktunaxa Treaty Council and the KNC with an opportunity to review the research results and provide comments before the final product is completed.

17. Researchers must provide one copy of the final product of the research project to:
a) the Elders Group;
the Ktunaxa Treaty Council; and
the KNC.

IMPLEMENTATION

18. This Code must be included in all research contracts with individuals, groups, agencies and organizations conducting research authorized by the Elders Group, the Ktunaxa Treaty Council, the KNC or member bands.

19. Every person to whom this Code applies is required, prior to commencing their research, to sign an agreement stating that they have read and understand the Code and that they agree to be bound by it.

20. It is the responsibility of the Ktunaxa Treaty Council to monitor the implementation of the Code and to make decisions regarding its interpretation and application as well as compliance with its provisions.

REVIEW

21. The Elders Group, the Ktunaxa Treaty Council and the KNC will review this Code at least once every calendar year.

22. This Code must be reviewed at the time a Ktunaxa Nation treaty or self-government agreement comes into effect in order to determine what changes are required to the Code.

AMENDMENTS

23. From time to time, the Elders Group, Ktunaxa Treaty Council and the KNC (or their successors) may by mutual agreement amend this Code.

COPIES OF CODE

24. An up-to-date copy of this Code, including any amendments that have been adopted, maybe obtained from the Ktunaxa Treaty Council office.

ADOPTION

25. This Code comes into force once it has been approved by the Elders Group, the Ktunaxa Treaty Council and the KNC.

ATTACHMENT FOUR - GUIDELINES FOR INFORMED CONSENT

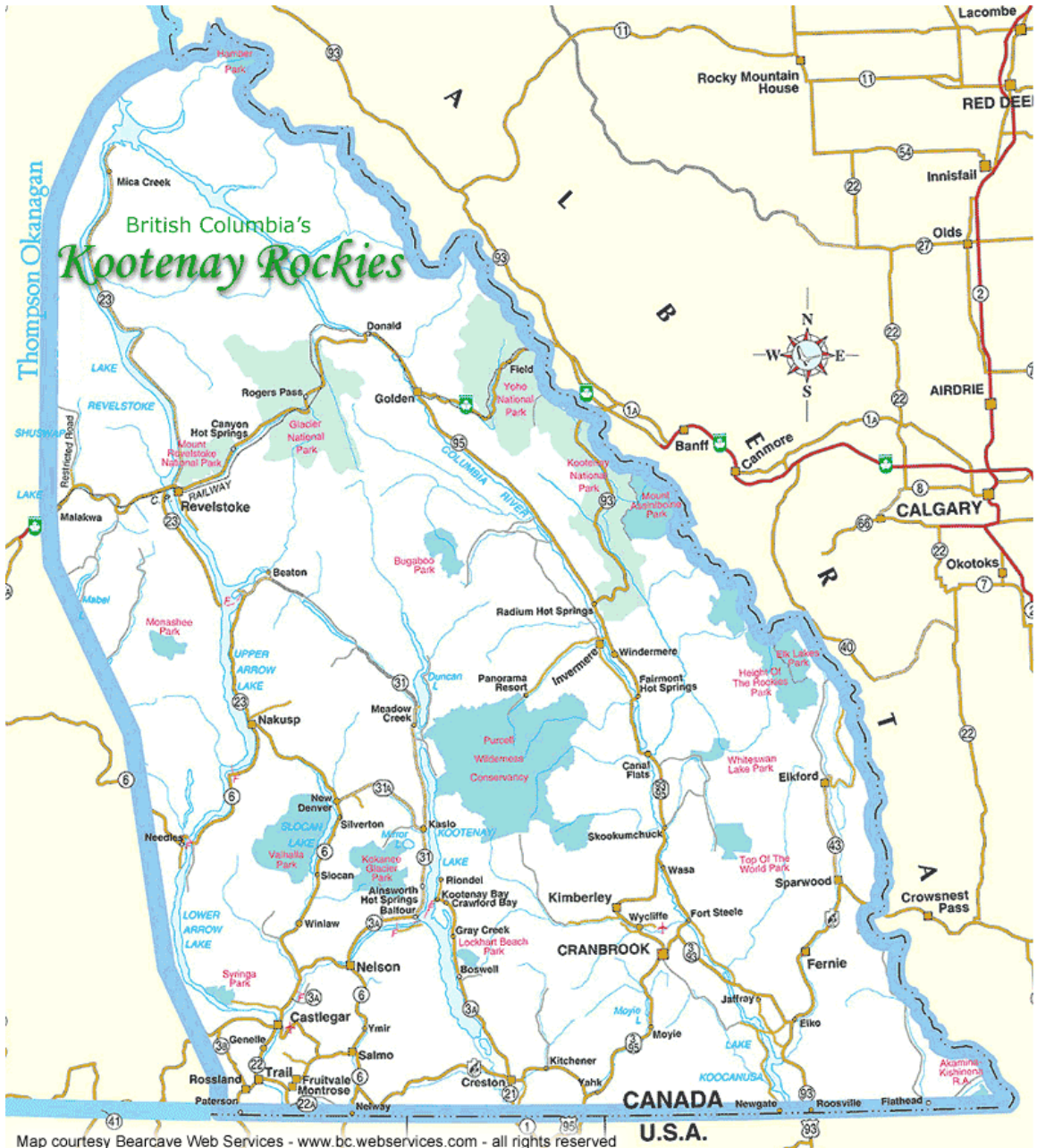
Research Project Title: Exploring the Uses of Connectivity and Information and Communications Technologies: The Ktuanxa Nation Network in British Columbia, Canada

Researcher: Heather Henley

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

1. The purpose of this research is to examine the access to and uses of the Ktunaxa Nation Network. Additionally, the researcher will provide information to the Ktunaxa Nation about other uses in different communities.
2. The requested interview would include a conversation including predetermined questions lasting approximately one hour in length.
3. There is no risk.
4. I would like to use a hand held tape recorder during the interview to be used only to create notes of the interview. In other words, not to be replayed by any other person.
5. Confidentiality will be ensured. Names are not recorded (unless requested) and data will be kept in a locked cabinet.
6. Once the report has been drafted and revised an executive summary of the project and its findings and recommendations will be presented to interested individuals for verification.
7. Each person that participates in the study will be invited to enter their name in a draw for a Nintendo Wii.

ATTACHMENT FIVE - MAP OF BRITISH COLUMBIA'S KOOTENAY ROCKIES SHOWING CRANBROOK AND SURROUNDING AREAS



ATTACHMENT SIX – POSTER FOR THE 2009 ICT SUMMIT (FEBRUARY 19-22, 2009 - VANCOUVER, BC)
2009 THEME: COMMUNITY, TOOLS, CULTURE
HOSTED BY: THE FIRST NATIONS TECHNOLOGY COUNCIL



The poster features a dark background with a wavy orange and green banner at the top. The main title '2009 Summit' is in yellow, and 'COLLABORATION' is in large green letters. Below this, the theme 'Community Tools Culture' is written in yellow and green. The date 'February 19-22, 2009' is in yellow. Logos for the First Nations Technology Council and PCNA are present. Several circular inset photos show people at the summit, including a man speaking at a podium, two men shaking hands, and a group of people at a table.

2009 Summit
COLLABORATION
One Conference * Coming Together * Join the Family
Community
Tools
Culture
February 19-22, 2009
FIRST NATIONS Technology Council
PCNA
Coast Plaza Hotel * Vancouver

ATTACHMENT SEVEN – Participant Overview

(Gender, age, community member status, community, employment, computer at home, internet at home and interview type).

	Gen der	Age	Band Member	Community	Computer At Home	Internet At Home	Interview Type
1	M	51-55	No	Cranbrook	Yes	Yes	Key Informant
2	M	36-40	No	Cranbrook	Yes	Yes	Key Informant
3	F	51-55	No	Cranbrook	Yes	Yes	Other Use
4	M	36-40	Yes	Cranbrook	Yes	Yes	Key Informant
5	F	21-25	Yes	Aqam	Yes	Yes (NN)	Community Member
6	F	21-25	Yes	Cranbrook	Yes	Yes (Shaw)	Key Informant
7	M	26-30	Yes	Akisqnuq	Yes	Yes	Key Informant
8	F	46-50	Yes	Aqam	Yes	Yes (NN)	Community Member
9	M	51-55	Yes	Tobacco Plains	No	No	Community Member
10	F	51-55	Yes	Tobacco Plains	Yes	Yes (NN)	Community Member
11	M	51-55	Yes	Tobacco Plains	Yes	Yes	Network Narrative
12	F	31-35	Yes	Tobacco Plains	Yes	Yes	Community Member
13	M	21-25	Yes	Tobacco Plains	Yes	No	Community Member
14	F	16-20	Yes	Tobacco Plains	No	No	Community Member
15	M	21-25	Yes	Tobacco Plains	Yes	Yes (Telus)	Community Member
16	F	46-50	Yes	Tobacco Plains	Yes	Yes (Telus)	Community Member
17	M	26-30	No	Radium Hot Springs (Akisqnuq)	Yes	Yes	Other Use
18	M	46-50	Yes	Akisqnuq	Yes	Yes	Community Member

19	M	56-60	Yes	Akisqnuk	No	No	Other Use
20	F	21-25	Yes	Akisqnuk	Yes	No	Other Use
21	F	31-35	Yes	Akisqnuk	No	No	Community Member
22	F	31-35	Yes	Aqam	Yes	Yes (NN)	Community Member
23	F	51-55	Yes	Akisqnuk	Yes	Yes (Telus)	Other Use
24	F	12	Yes	Akisqnuk	Yes	Yes (Telus)	Other Use
25	M	21-25	Yes	Aqam	Yes	Yes (Shaw)	Other Use
26	F	46-50	No	Akisqnuk	Yes	Yes (Telus)	Community Member
27	F	51-55	Yes	Akisqnuk	No	No	Community Member
28	F	46-50	Yes	Akisqnuk	No	No	Community Member
29	M	26-30	Yes	Akisqnuk	No	No	Community Member
30	F	51-55	No	Aqam	-	-	Network Narrative
31	M	51-55	No	Cranbrook (Aqam)	-	-	Key Informant
32	F	31-35	Yes	Aqam	Yes	Yes (NN)	Community Member
33	F	31-35	Yes	Aqam	Yes	No	Community Member
34	M	56-60	No	Aqam	Yes	Yes (NN)	Community Member
35	F	21-25	Yes	Aqam	Yes	Yes (Shaw)	Community Member
36	F	81+	Yes	Tobacco Plains	Yes	No	Key Informant
37	M	31-35	No	Cranbrook (Aqam)	-	-	Key Informant
38	M	31-35	No	Cranbrook (Aqam)	-	-	Key Informant
39	F	46-50	Yes	Aqam	Yes	Yes (NN)	Community Member

40	F	61-65	Yes	Aqam	Yes	Yes (NN)	Community Member
41	F	61-65	No	Cranbrook (Aqam)	Yes	Yes	Other Use
42	F	61-65	No	Creston (L. Koot)	Yes	Yes	Other Use
43	M	36-40	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
44	F	31-35	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
45	F	46-50	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
46	F	26-30	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
47	F	46-50	Yes	Cranbrook (Shuswap)	Yes	Yes (Shaw)	Other Use
48	F	26-30	No	Kimberly (Aqam)	Yes	Yes	Key Informant
49	M	26-30	Yes	Aqam	Yes	Yes (Telus)	Other Use
50	M	16-20	Yes	Aqam	Yes	No	Community Member
51	M	41-45	No	Cranbrook	Yes	Yes (Shaw)	Network Narrative
52	F	46-50	Yes	Aqam	Yes	Yes (NN)	CM and Key Infor.
53	M	51-55	No	Aqam	Yes	Yes (NN)	Key Informant
54	M	26-30	No	Cranbrook	Yes	Yes (Telus)	Network Narrative
55	M	36-40	No	Cranbrook	Yes	Yes (Shaw)	Other Use
56	M	36-40	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
57	F	26-30	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
58	F	61-65	Yes	Lower Kootenay	Yes	Yes (Shaw)	Community Member
59	M	36-40	No	Cranbrook	Yes	Yes (Shaw)	Key Informant
60	M	51-55	No	Cranbrook	Yes	Yes (Shaw)	Network Narrative

61	F	61-65	Yes	Cranbrook	Yes	Yes (Telus)	Network Narrative
62	F	46-50	Yes	Aqam	Yes	Yes (NN)	Other Use
63	F	46-50	Yes	Akisqnuk	Yes	Yes (Telus)	Network Narrative
64	F	51-55	Yes	Invermere (Shuswap)	Yes	Yes (Telus)	Other Use
65	F	51-55	No	Invermeme	Yes	Yes (Telus)	Other Use