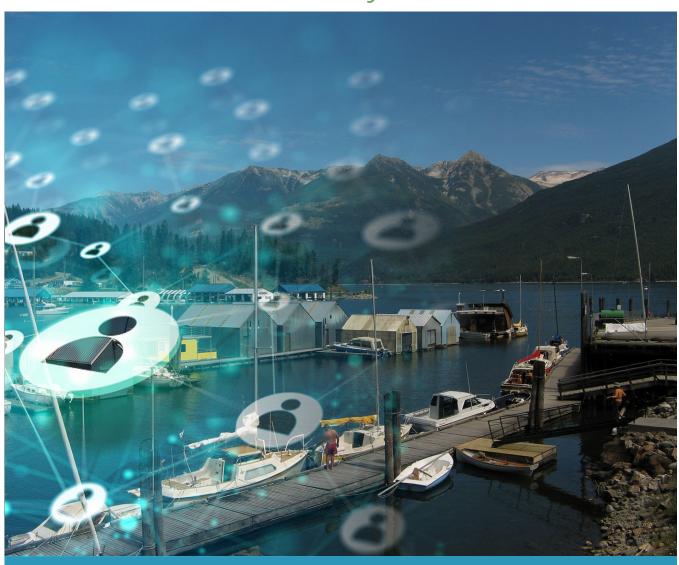
DIGITAL READINESS: AN EVALUATION OF RURAL BROADBAND MODELS IN BRITISH COLUMBIA -2021 APPLIED RESEARCH PROJECT

# Kaslo infoNet Society



APPLIED RESEARCH SINNOVATION
Selkirk College



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### **EXECUTIVE SUMMARY**

Connectivity is now considered to be a critical service, a foundational need to actively participate in the economy and society. Rural communities, including local government, community groups, and individuals are increasingly playing active roles in improving rural connectivity. The overarching goal of the *Digital Readiness* project is to better understand the different models of community involvement in connectivity that exist and the related benefits and challenges in order to inform other communities. As part of the *Digital Readiness* project, the project team conducted two evaluations of existing examples of community-led connectivity initiatives in rural BC.

This report presents the results of the evaluation of Kaslo infoNet Society. The Kaslo infoNet Society (KiN) is a rural community-controlled non-profit society that was formed in 1996 to build a community access network for Kaslo and its neighboring communities in the Regional District of Central Kootenay in south-east BC. (Kaslo infoNet Society 2021) KiN is dedicated to improving local access to connectivity and is demonstrating an innovative approach to connectivity technologies to future-proof rural community networks.

Through the completion of a detailed desktop analysis and conduction of interviews with key case study individuals, information about the need for connectivity in the North Kootenay Lake communities and the fulfillment of those needs by KiN were identified, alongside some of the barriers and challenges KiN faced. These include:

#### Need for Connectivity:

- Maintaining community viability
- Retaining youth and professionals
- Increased connectivity demands during the ongoing COVID-19 pandemic

#### • KiN's Role in Connectivity and the Community:

- O Building and operating a robust and reliable community access network using innovative technologies and infrastructure to service Kaslo and the North Kootenay Lake communities
- Connectivity advocacy and community championship

#### Barriers and Challenges:

- Permitting and policy challenges
- Funding and cost-related challenges
- Geospatial challenges

Based on the analyzed data, we were able to identify that KiN has been successful due to the combination of four key success factors:

Leadership

Funding

Community Partnerships

Community Focus

What KiN has accomplished is unique and special, as rural communities are each unique and special. Each of the above defining variables contributed to KiN's success as a community organization, with a special emphasis on maintaining strong leadership and community focus. Through our exploration of rural connectivity in British Columbia, our research supports the idea that a non-profit is the most promising connectivity model for a community with similar demographic and geographic conditions. These considerations, in addition to the innovative technologies KiN is piloting, could be adapted to fit any rural community looking to undertake their own connectivity initiative.

### 1. INTRODUCTION

Connectivity is now considered to be a critical service, a foundational need to actively participate in the economy and society. However, rural communities in British Columbia (BC) continue to face challenges with connectivity. Rural communities, including local government, community groups, and individuals are increasingly playing active roles in improving rural connectivity. The overarching goal of the *Digital Readiness* project is to better understand the different models of community involvement in connectivity that exist and the related benefits and challenges in order to inform other communities. As part of the *Digital Readiness* project, the project team conducted two evaluations of existing examples of community-led connectivity initiatives in rural BC.

This report presents the results of the evaluation of Kaslo infoNet Society. The Kaslo infoNet Society (KiN) is a rural community-controlled non-profit society that was formed in 1996 to build a community access network for Kaslo and its neighboring communities in the Regional District of Central Kootenay in south-east BC (Kaslo infoNet Society 2021). Initially, KiN provided the community with basic Internet services, and at the time, their dial-up internet service was the only way people in the local telephone exchange could connect a local call while avoiding high toll charges. In 2006, KiN began creating a wireless high-speed community access network for North Kootenay Lake communities that has since evolved into a robust and reliable 300-megabit symmetrical fibre-optic network (Kaslo infoNet Society 2021) (KIN1 2021). KiN is dedicated to improving local access to connectivity and is demonstrating an innovative approach to connectivity technologies to future-proof rural community networks.

This report provides a short overview of the evaluation approach, followed by a presentation and discussion of findings.

This report and evaluation have been used to support the creation of an early-stage policy model for supporting communities pursuing connectivity initiatives (Breen et. al, 2021a).

### 2. EVALUATION APPROACH

The evaluation of Kaslo infoNet Society piloted an evaluation approach developed as part of the *Digital Readiness* project. The details of the evaluation approach are documented and available as a separate Evaluation Process report (Breen et. al, 2021b). The overarching evaluation approach identified 20 specific metrics relating to the technological, social, political, economic, and physical aspects of connectivity.

Metric data was collected from two types of sources. First, secondary data sources were reviewed. Community profiles (Columbia Basin Rural Development Institute 2020) and census data (Statistics Canada 2016) were examined to identify and understand the technological, social, political, economic, and physical characteristics of Kaslo and North Kootenay Lake communities. The BC Community Information Tool was also used to further develop an understanding of these factors, as well as connectivity (Province of British Columbia 2021). The National Broadband Internet Service Availability Map was used to determine elements of internet service provision, such as communities served, reported service speeds, types of technologies in use, and service providers in the area (Government of Canada 2021).

Next, primary data was collected through key informant interviews<sup>i</sup>. Interviewees were identified based off of their involvement with the case study organization, the case study community, or their high-level knowledge of connectivity, especially as it pertains to rural communities. Eight interviews were conducted with three types of interviewees: internal interviewees (3/8), local external interviewees (1/8), and big picture interviewees (4/8). Interviews conducted with individuals from within KiN (internal) and the service area (local external) facilitated the development of knowledge on KiN's operations, the impact they have had on the communities they serve, and the relationships KiN has with local government. Local external interviewees included representatives from local government and individuals involved in community economic development. Big picture interviews were conducted with connectivity experts, industry professionals, and representatives from high-level government to provide insight into the circumstances surrounding rural connectivity in BC and Canada, including obstacles and possible solutions.

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<sup>&</sup>lt;sup>i</sup> Selkirk College Ethics Approval REB 2021-016.

A transferrable evaluation framework was developed by the broader project to compile and analyze the quantitative and qualitative secondary data that was collected during this project against 20 pre-determined metrics (Breen et. al, 2021b). Interviews were transcribed and data was matched to the evaluation metrics and summarized. A similar process was followed for the secondary data, where a desktop analysis was conducted for each of the communities served and information was categorized under the appropriate metric for each community. Following that, all information for each metric was again compiled and summarized.

As with any research, there are limitations to this evaluation, primarily as a result of the short duration of the project and that it occurred over the summer when many people were on vacation. Given that there were a limited number of interviewees and an unequal number of interviewees in each interviewing category, some perspectives may have been missed. Additionally, there is limited information available pertaining to connectivity and KiN's operations in the small North Kootenay Lake communities due to their low population density and the unincorporated status of some of the smaller service areas. Additionally, while interview data was triangulated against secondary sources, we acknowledge that there is limited information available related to some metrics.

### 3. FINDINGS

For the Kaslo infoNet Society's evaluation data was available for 19 of the 20 metrics. Of these, analysis revealed that 17 have a critical influence on the workings of KiN. Table 1 provides an overview of the metrics, rationale and importance, and a short summary of the data.

Table 1: Metrics Overview and Summary of Findings

Metric	Summary of Findings	Critical Influence
<b>Demographics</b> Determine potential client base and user population. Speaks to market size.	Kaslo and North Kootenay Lake have a combined population of 2311 persons, 968 of which reside in Kaslo. Kaslo has experienced a 1.22% decrease in population between 2011-2016. Additionally, the median age is 56, which has increased by 1.33% between 2001-2016 (Statistics Canada 2016). This indicates an aging and declining population.	YES
Population Density Determine potential client base and user population. Speaks to market size.	Kaslo's population density is 321.9 people per sq kilometer, while the population for the North Kootenay Lake area is 0.2 people per sq kilometer (Columbia Basin Rural Development Institute 2020).	YES
Consumer Income Levels Indication of the purchasing power of clients/users. Speaks to equity and accessibility.	The median household income in Kaslo was \$44, 096 in 2016, which has seen an increase of 1.36% between 2001-2016 (Statistics Canada 2016). Most inhabitants at Kaslo are above the low-income cut-off.	No
Community Digital Capacity Identify existing communal digital literacy. Speaks to market need.	Residents of Kaslo have standard digital literacy and connectivity needs (KIN2 2021). By having access to robust and reliable connectivity, KiN is providing their customers with the opportunity to improve their own digital literacy.	No
Organization Capacity Determine current level of human capacity within organizations.	KiN is led and operated by highly skilled, experienced, and motivated individuals (KIN1 2021) (KIN2 2021) (KIN3 2021) (LE1 2021). Their dedication and advocacy are invaluable assets to KiN and the community.	YES

Metric	Summary of Findings	Critical Influence
Terrain and Landscape Determine constraints on infrastructure options and physical challenges.	Kaslo is remote and mountainous and is situated at the delta of the Kaslo River, which empties into Kootenay Lake (Visit Kaslo 2020). The Kaslo area, like many rural communities, has many unpaved roads, making the burial of fibre easier (KIN1 2021).	YES
Number and Types of Businesses Determines potential business clients and user base. Speaks to market size and need.	There are 99 business listings in the Kaslo Chamber of Commerce directory, in a variety of industries, including trades, hospitality, and tourism (Kaslo Chamber of Commerce 2021).	YES
Community Impact Determine who benefits and impact factors. Contribute to understanding of challenges, barriers, cons.	KiN has brought a robust and reliable community access network to Kaslo and North Kootenay Lake residents, comparable to that of major urban centers (KIN1 2021). As a non-profit society, much of its revenue is reinvested into the community through staff wages. KiN provides employment and skills training opportunities to the community.	YES
Community Needs Understand community connectivity needs.	From entertainment to remote work to staying connected, KiN's residential and business internet services have revitalized the North Kootenay Lake communities. This improved connectivity has encouraged the expansion and retention of the residents and businesses in the Kaslo area (KIN2 2021).	YES
Existing Government Activity  Determine the involvement or role of all levels of government.	KiN has received support from the Village of Kaslo in the form of a 30-year permit to place fibre anywhere within the boundaries Kaslo, which is helpful given that obtaining permits like these can be a major obstacle. (KIN1 2021). KiN has received provincial and federal support in the form of grant funding, allowing KiN to build and expand their community access network. (KIN2 2021) (BPE2 2021). Permitting and building requirements and stipulations can pose significant operational challenges.	YES
Competition Understand existing competitive landscape and determine role and level of autonomy of the case study service provider.	KiN has competition from Telus due to their ownership of telecommunications infrastructure in the Kaslo area. (KIN2 2021). Private sector for-profit enterprises like Telus have significant capital at their disposal relative to small non-profits like KiN, however KiN is able to compete with them directly on capability, capacity, and price (KIN1 2021) (KIN3 2021).	YES
Funding Determine sources and amount of funding. Speaks to financial capital.	Since 1996, KiN has received funding from Network BC (Connecting Communities), Connecting Canadians federal grants, Columbia Basin Broadband Corporation (CBBC), Northern Development Initiative Trust (NDIT), and Regional District Central Kootenay (RDCK). Startup capital was contributed by founding local citizens (KIN2	YES

Metric	Summary of Findings	Critical Influence
	2021). CBBC has also aided KiN when applying for	
Model Profit  Determine profitability and return  on investment for the model.	provincial and federal grant funding.  KiN is a non-profit organization. KiN made approximately \$650,000 in 2020, of which \$450,000 (profit) was paid out to staff in the form of salaries (KIN1 2021). Operating as a non-profit was a suitable choice for KiN due to the small customer base and large geographical spread within their service area. These circumstances would not typically pose a strong enough business case to attract for-profit enterprises.	YES
Community Investment  Determine amount invested into community and what it is spent on.	KiN has brought benefits and investment to the community (Kaslo infoNet Society 2021). Last year, \$450,000 was paid out to local staff in the form of salaries, which would contribute to the local economy. KiN also invests in the community by investing in their staff via skills training (KIN1 2021).	YES
Existing Technology and Type  Determine type of technology used and reason behind its use.	The CBBC fibre backbone is a critical element of KiN's service delivery (KIN1 2021) (KIN2 2021). The KiN methodology is pure switched Point to Point Ethernet over Single Mode Optical fibre running on IETF Internet protocols. That combination of hardware in the control of the community makes it possible to treat the entire region as if it were on a high-performance LAN in a single building (KIN1 2021).	YES
Existing Service Quality and Type Identify services offered and the quality of services in the service area.	Before KiN existed, Kaslo had extremely limited connectivity. They were served by DSL, and interviewees reported inconsistent service throughout the Village and was topping out at 1.5mbps. Now, KiN's symmetrical fibre network services the area with reliable connectivity at speeds up to 300mbps. KiN continues to use existing wireless towers to service the more remote locations in the area (KIN1 2021) (KIN2 2021).	YES
Infrastructure  Determine infrastructure needed to support broadband operations and expansion, and associated expenses.	KiN operates a point-to-point symmetrical ethernet network, on 10G single mode fibre backbone and a 1G end point, exceeding the 50/10mbps standard. This means that it is possible to treat the entire region as if it were on a single high-performance connection contained within a single building (KIN1 2021).	YES
Price of All Available Internet Services Information on case study and competitor pricing. Will help determine competitive advantage and probability of success.	KiN's services are priced competitively. Their residential wireless and fibre package options range from \$54.95-\$119.95 per month, and their business wireless and fibre package options range from \$89.95-\$899.95 per month. The inclusion of access to KiN's VOIP calling services ranges from \$19.95-\$75.00 per month. These charges do not include installation or connection fees (Kaslo infoNet Society 2021).	YES

Metric	Summary of Findings	Critical Influence
Customer Satisfaction Determine how customers feel about their current internet services. Relates to customer retention factors and areas for improvement.	No data available.	N/A
Company Structure and Performance Gain an understanding of the case study ISP and the environment it operates in.	KiN is a small non-profit society operated by a skilled team of staff and a volunteer board. KiN is focused on last-mile connection, for which CBBC provides the fibre backbone. KiN aims to service all of regional district area D in the West Kootenays with high-speed symmetrical fibre connection (KIN1 2021) (KIN2 2021).	YES

### 4. DISCUSSION OF FINDINGS

This discussion section will address the need for connectivity in Kaslo and North Kootenay Lake communities, KiN's role in connectivity in the community, and the barriers and challenges they encountered on their way to success.

#### **Need for Connectivity**

With connectivity is now being considered a critical service, and a foundational need to actively participate in the economy and society, it is more important than ever before to connect rural communities in British Columbia. Small rural communities continue to face challenges with obtaining and maintaining sufficient connectivity service and infrastructure. Without connectivity, rural communities will struggle to navigate the diverse 21st century economy and may miss out on essential opportunities related to emergency services, health, education, business, communication, and entertainment. The need for reliable connectivity has only become more apparent in light of the COVID-19 pandemic, with numerous households, businesses, and services relying on its use to conduct their daily work and operations.

Without sufficient connectivity, remote communities experience an out migration of their population, especially in youth and professionals. This was the case in Kaslo, as indicated in the demographics section above, where we saw a shrinking population with an increasing median age. Improving connectivity in the Kaslo and North Kootenay Lake area not only increases the viability of the community, but also helps retain professionals and encourages young adults to return to their rural community after completing their post-secondary education.

#### KiN's Role in Connectivity and the Community

Kaslo infoNet Society is providing connectivity solutions to the rural communities of North Kootenay Lake by providing them not only with high-speed internet at comparable prices, but a technologically innovative and sustainable network that will help keep these rural communities viable and maintain access to connectivity services. Without KiN, other large ISPs would have had an unchallenged monopoly of the region's customers, providing a slower, asymmetrical service. For part of the KiN service area, without KiN they would have little or no access to internet, because such small communities typically do not present a strong enough business case to attract a large ISP (BPE2 2021). Rural communities often receive very little consideration from large for-profit ISPs when technologies become outdated or need repairs, due to their insufficiently sized customer base and associated profit margins. With poor or no access to connectivity, Kaslo would continue to see the out migration of youth and professionals – as they have in recent years because they do not have the same opportunities that they would in a well-connected urban location (BPE4 2021).

Over the past 25 years that they have been in operation, KiN has strived to ensure that Kaslo and the communities of North Kootenay Lake are not overlooked in terms of connectivity because of their relative size and remoteness, and they continue to expand and improve their community network. KiN is also providing more than high-speed internet.

They advocate for connectivity in a community where connection was absent or a struggle, and they are engaging modern, innovative technologies in meaningful ways that will keep their communities viable for years to come.

Before KiN existed, Kaslo had extremely limited connectivity. They were served by DSL using outdated and impaired copper wiring for service delivery, and interviewees reported inconsistent service throughout the Village and was topping out at 1.5mbps. Now, KiN's symmetrical fibre network services the area with reliable connectivity at speeds up to 300mbps (KIN1 2021) (KIN2 2021). The KiN methodology is pure switched Point to Point Ethernet over Single Mode Optical fibre running on IETF Internet protocols. That combination of hardware in the control of the community makes it possible to treat the entire region as if it were on a high-performance LAN in a single building (KIN1 2021). The difference in both technology and service delivery has made a very real difference to the rural and remote communities in KiN's service area.

Through leadership and vision, community-mindedness, forward-thinking, and dedication, KiN has become not only successful, but a valued community champion. By designing, building, and operating the last mile of community network, KiN has ensured that the communities surrounding North Kootenay Lake are connected at competitive speeds, capacity, and prices. KiN has also, in their policy, mandated that they cannot be bought out, which ensures their own sustainability as well as the continuity of the services that they provide (KIN1 2021).

#### **Barriers and Challenges**

KiN has encountered barriers along the way but has found ways to overcome them, or persevered right through them. However, these barriers should be considered carefully by communities who are considering creating a not-for profit community telecommunications society.

Some of these barriers include permitting or policy challenges, funding or cost-related obstacles, and geospatial issues. For example, permitting and infrastructure building policies come with an extensive set of compliance requirements that any connectivity organization must meet in order to build their infrastructure. Another challenge is the mandated timeframe in which an organization must build their infrastructure as a stipulation of their grant funding. It can take quite some time for supplies to arrive if they are ordered internationally, which limits the amount of time left available to actually build the infrastructure. This becomes even more of a challenge as winter approaches and the ground begins to harden and freeze (KIN2 2021). If this time sensitivity is to be resolved, it must be done by negotiating with structural and financial regulators to extend the allotted window of time where an organization is permitted to build.

### 5. CONCLUSIONS

The overarching goal of the *Digital Readiness* project is to better understand the different models of community involvement in connectivity that exist and the related benefits and challenges in order to inform other communities. Some of the success factors of KiN's approach to connectivity and key takeaways of this project are discussed below.

Based on the analyzed data, we were able to identify that KiN has been successful due to the combination of four key success factors: their strong and experienced leadership, strategic community partnerships, appropriate funding, and community focus.

Leadership: KiN's social capital and leadership is a large contributing factor to their success. Their leadership team possesses a unique and extensive collection of skills, including electrical, construction, engineering, business, and network operation experience. Some of KiN's leaders also had experience with permitting requirements and international shipping and purchasing practices form their previous career experiences which was extremely helpful to KiN. In addition to voluntarily contributing their time, the initial founders also contributed a significant amount of startup capital before KiN was able to secure grant funding. The hard work and dedication of KiN's staff and volunteer board should also be recognized.

**Partnerships:** According to interviewees, a critical partnership that KiN has is with the Columbia Basin Broadband Corporation (CBBC), whose fibre backbone connects KiN's last mile services to the internet exchanges in Vancouver and

Calgary. In addition to lending KiN their infrastructure, CBBC has helped KiN coordinate grant funding applications on occasion, so that they can continue expanding their community network and bringing strong connectivity to these rural communities. Additionally, KiN's close cooperative relationship with the Village of Kaslo has proved to be an asset.

**Funding:** KiN has received multiple funding opportunities from municipal, provincial, and federal sources. Some of these sources include Network BC (Connecting Communities), Connecting Canadians federal grants, Columbia Basin Broadband Corporation (CBBC), Northern Development Initiative Trust (NDIT), and Regional District Central Kootenay (RDCK). As mentioned above, startup capital was also contributed by founding local citizens (KIN2 2021). Consistent and generous funding has allowed KiN to establish itself and the expansive network that services the North Kootenay Lake communities.

Community Focus: Throughout KiN's history, the non-profit organization has maintained its community focus by dedicating itself fully to the community and evolving to fulfill the community's needs at the given time. In 1996, when students required connectivity for their studies, the original founders of KiN connected them. When the community was later faces by high toll charges imposed by a larger telecommunications company, KiN adjusted its focus again to subvert these. Now, when the North Kootenay Lake communities need reliable connectivity, KiN build a robust and innovative network to serve the communities and help keep them viable. KiN's standing as a non-profit is also a reason that the organization has been able to become successful, given the spread and small population of the North Kootenay Lake communities do not typically present a compelling enough business case to attract larger telecommunications providers. This versatility, dedication, and non-profit standing have made a significant impact on the community and have helped to make KiN the success it is today.

What KiN has accomplished here is unique and special, as rural communities are each unique and special. Each of the above defining variables contributed to KiN's success as a community organization, with a special emphasis on maintaining strong leadership and community focus. Through our exploration of rural connectivity in British Columbia, our research supports the idea that a non-profit is the most promising connectivity model for a community with similar demographic and geographic conditions. These considerations could be adapted to fit any rural community looking to undertake their own connectivity initiative.

It is worth noting KiN's innovative approach to connectivity technology and infrastructure. While unique and innovative, the research indicates that the above factors were more influential on their success. This technology is accessible, affordable, and deployable in any rural community, and far more easily deployable in rural areas because there is little or no existing infrastructure to contend with in those areas (KIN1 2021).

Potential future research could include a longer exploration into the rural case study community, so as to overcome the time limitation and the vacation-related absences that are typical in summer. This would allow the conduction of more interviews, especially at the higher two levels (local external, big picture), to help ensure that no perspectives were missed. Additionally, there is limited information available pertaining to connectivity and KiN's operations in the small North Kootenay Lake communities due to their low population density and the unincorporated status of some of the smaller service areas. Exploring the circumstances of these smaller communities could potentially fill in any potential knowledge gaps.

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