Regional Fibre-to-the-Premise and Cellular Connectivity

Prepared for:

BROADBAND INTERNET AND MOBILITY COMMITTEE

PEACE RIVER REGIONAL DISTRICT

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2.0 EXECUTIVE SUMMARY

The Peace River Regional District (PRRD) has been actively engaged in activities to advance connectivity within the region since 2019. The PRRD is characterized by rolling prairie hills and spread out, small communities. In the data set for the on-line **National Broadband Internet Service Availability Map,** managed by Innovation, Sciences and Economic Development Canada (ISED) to track the progress of the Canadian Radio-television and Telecommunications Commission's (CRTC) universal 50/10 broadband objective, the PRRD is defined as having 88 communities. Of the 88 communities within the PRRD, 84 have less than 1,000 households are therefore considered rural by the Canadian Radio-television and Telecommunications Commission (CRTC) definition.

The last update of the **National Broadband Internet Service Availability Map,** in November 2023, shows that of the 88 communities within the PRRD; 21 are reported as being 50/10 with 9 being partially fibre-to-the-premise, usually just the town centre and 12 being 50/10 using hybrid fibre coax, the access technology used by the traditional cablecos. These 21 communities represent the largest, by household count, within the PRRD. The remaining 67 communities are sub 50/10 and are either served by fixed wireless service providers with being 25/5 typical or by the telco with digital subscriber line (DSL) where 10/2 or 5/1 is typical depending on physical distance.

During 2024, there has been a flurry of funding applications for FTTP buildouts before Connecting Communities BC (CCBC), ISED's partner for the administration of the federal Universal Broadband Fund. In fact, only eight of the 67 communities, three larger ones - Kwadacha Nation, Tsay Keh Dene Nation and Kelly Lake and five very small ones, all ranches in Electoral Area B appear not to be the subject of any FTTP funding applications. The other 59 communities within the PRRD are the subject of a FTTP funding application by at least one service provider. This is an extraordinarily good development in the last three years since the PRRD undertook their last connectivity study with Valo Networks. At that time, there was minimal interest by service providers to extend broadband services and it was thought that PRRD would have to create financial incentives to entice service providers. Furthermore, in the three years since the last study, the only access network technology that is being funded is FTTP.

Since the last study, there seems to be a significant change in the presence of fibre transport facilities. In fact, according to November 2023 data set in the National Broadband Internet Service Availability Map, all but 3 communities- Kwadacha Nation, Tsay Keh Dene Nation and Kelly Lake have fibre transport facilities. Furthermore, from plans shared by several service providers with the PRRD, service providers seeking FTTP funding also have minor transport facilities included within their applications to support the reach to the very rural areas. This is good news but does not address transport resiliency issues within the PRRD as demonstrated by the recent multi-day outage of communication – cellular, 911 and internet between Hudson's Hope and West Moberly. There is hope that the new Rogers fibre transport cable being built in the area and currently delayed until yearend 2024, will address the resiliency but there are no guarantees as it is likely that the new Rogers cable is over-lashed to the

existing TELUS cable along the exposed pole line on the highway. While the focus of this report is on FTTP in rural areas, future studies will need to address communication resiliency.

Until the funding is awarded and publicly announced, the service providers treat the communities listed in their funding applications as commercially confidential. In a case where multiple service providers have applied for funding for the same community, the CCBC fund administrators must review the merits of each submission, such as size, scope and community support, and select only one service provider for funding. Depending on the community location and size, loss of funding for one community may adversely impact the service provider's business case for the remainder of the communities included in their funding application. Consequently, while it is good news that almost all rural PRRD communities are part of at least one FTTP funding application, it will remain unclear as to which service providers will receive FTTP funding for which communities until late 2024 when the CCBC administrators are expected to finalize their funding decisions. For the three larger communities – Kwadacha Nation, Tsay Keh Dene Nation and Kelly Lake, Planetworks has offered capital and operational budgets for planning purposes. For each of the local governments, Planetworks has developed a connectivity dashboard included in the Appendices which captures the status of connectivity for the area of each local government and can be used to benchmark connectivity progress in PRRD future studies.

While there has been significant activity on the broadband front, there has been minimal development since the last report to extend cellular services along unserved highways. This is due in part to funding subsidies only being available for the upfront capital (capex) and not for the on-going operational costs (opex). The cellular service providers are seeking subsidies for both capex and opex as the market is saturated and the addition of new cell sites along unserved highways means added costs without added revenues. The one exception is an activity underway by Rogers to provide coverage along Highway 97 between Chetwynd and Pine Pass. This project has been delayed but is expected to be in-service in 2025 and will provide much needed cell coverage along this corridor. For the remaining major highway corridors, Planetworks conducted a coverage analysis of the major corridors and identified coverage gaps and capex and opex budgets to address those gaps.

2.1 RECAP OF RECOMMENDATIONS FROM PREVIOUS STUDIES AND STATUS

Summary of Valo Recommendations

In 2021, the original PPRD Connectivity report (Valo) recommended several key actions for improving broadband and cellular services in the PRRD. First, the Regional Board should authorize an Internet Speed Test Campaign, which is ongoing and gathers data from the public. Valo suggested exploring connectivity projects and leveraging funding from public and private partners as an option if all communities don't receive FTTP funding. The Broadband Internet and Mobility Standing Committee has been established, and a connectivity work plan has been developed.

Engagement is ongoing with stakeholders and service providers to assess broadband needs and communicate service gaps. Updating of PRRD policies to support broadband deployment and

investigating a 'Dig Once' policy is also ongoing. Advocacy efforts to streamline the permitting process for broadband infrastructure with the BC Ministry of Transportation and Infrastructure, (MoTI) and calls for national strategies for spectrum allocation and pricing, continue. Although spectrum availability is no longer a priority due to expected FTTP funding, these recommendations remain relevant if funding for cellular services does not materialize.

The PRRD created Function 135 to manage broadband connectivity efforts, though financial investment has not been required to date. There are ongoing projects, such as Rogers' fibre backbone along Highway 97, which has faced delays. Although some recommendations, like preparing 'shovel-ready' last-mile connectivity proposals, are no longer valid due to new service provider funding rules, the board continues to advocate for predictable funding for rural broadband. Most PRRD communities now have backhaul connections, with only a few remaining underserved, requiring future advocacy for network resiliency.

Targeted Outcomes

- ***100% of critical community assets in the PRRD will have access to Broadband Internet services.***
- ***100% of households in the PRRD will have access to Broadband Internet services that meet a minimum service level of 50 Mbps download and 10 Mbps upload to be revised on a periodic basis as standards evolve.***
- ***There will be access to mobile wireless technology throughout every major transportation corridor in the Region*.**

The targeted outcomes, defined by Valo above, and approved by the PRRD Board remain priority outcomes in 2024. In addition, there also is a desire for highway and in-community 5G mobility coverage. 5G Mobility coverage is viewed as a personal safety requirement, particularly on highways.

2.2 NEW RECOMMENDATIONS

Planetworks recommends that the PRRD monitor the progress of service provider grant applications, with agencies like CCBC and CRTC and provide yearly updates to the BIMC. Planetworks suggests obtaining regular updates from service providers on buildout activities and sharing new information as it arises. Additionally, PRRD should review connectivity dashboards to identify communities still needing FTTP upgrades and prioritize future service strategies. After FTTP projects are completed, communities should be followed up with to verify that the service provider has built the network as planned and meets or exceeds the 50/10 standard. The PRRD should also use its website to inform residents about advancements in mobile coverage technology and how these can enhance safety on unserved highways. Lastly, progress on implementing cellular services along Highway 97, from Pine Pass to Chetwynd, should be tracked.

The following is a list of recommendations resulting from the analysis.

2.2.1 FTTP: Identify which Electoral areas and communities remain in need of FTTP upgrades and identify priorities and strategies for service provision going forward

2.2.2 FTTP: Work with service providers, BC Hydro, and individual BC government departments (MoTI, WLRS, CITZ, Crown Lands) to identify and reduce permitting delays for FTTP infrastructure to advance rapid buildouts

3.0 STUDY INTRODUCTION

Planetworks was retained by the PRRD to conduct a review of broadband and a cellular connectivity in the Region. Since 2021, there have been many changes to the connectivity environment with one the most important being a pledge by the BC Government to have every at least 50/10 to every household in BC by the end of 2027 spurring a massive funding application flurry by service providers. This massive funding application flurry has now reached rural areas in the PRRD with multiple service providers vying for FTTP funding. Regional and local governments have a significant advocacy and support role to ensure that all within their regions are included in service provider's plans. PRRD has been actively involved in discussions with service providers as have many of the local governments within the PRRD and have provided many letters of support. The question that arose after all this activity is: How many PRRD communities have service providers addressed with FTTP or applications for FTTP funding since 2021?

To quantify the extent of connectivity and connectivity plans within the Region, Planetworks mined publicly available information and developed a view of regional view of broadband and 5G connectivity by community. Armed with some public data, Planetworks met with key stakeholders to corroborate the data and collect comments on the quality of local connectivity and connectivity policy. Planetworks then compiled the data into three standalone sections, each with specific recommendations and next steps and each able to be updated independently of the other in the future. The three sections include:

- Connectivity Policy
- FTTP Connectivity
- Cellular Connectivity

Because connectivity is tracked at a community level, Planetworks created individual dashboards for each of the local governments within the PRRD and included the individualized dashboards as an Appendix.

When compared to the previous connectivity study published three years ago, minor changes have occurred for policy and for cellular deployment due to lack of funding. However significant changes have occurred in 50/10 broadband with FTTP being the preferred technology offered by service providers and selected by the funders for funding. Detail regarding Policy, FTTP and Cellular Connectivity are described in the next three sections.

3.1 PRRD ACTIVITIES TO DATE

To advance broadband connectivity the PRRD has engaged in many different activities including; meeting with representatives of CCBC, NDIT, ISED and ISP's, issuing letters of support to service providers, letters of concern regarding service levels and conducted various studies, including this one. The PRRD has issued some sixteen letters since 2018 about connectivity as attached in the appendices as History – Letters of Support. PRRD has also have engaged in numerous activities to further connectivity, including but not limited to:

- Retaining Valo Networks to conduct a connectivity status study, results outlined in the report **Connectivity Strategy Infrastructure Report,** dated November 2021 and discussed later in this section;
- Creating Bylaw No. 2487 dated November 2022 to establish a Regional Connectivity Service;
- Creating Policy 0340-70, Tower Siting, dated May 2022, to establish guidelines communications towers;
- Creating a Standing Committee of the PRRD Board dedicated to connectivity entitled **Broadband Internet and Mobility Committee**, Terms of Reference passed July 2022, and which meet quarterly to review regional connectivity;
- Creating and maintaining a public facing webpage within the PRRD website dedicated to connectivity for constituents to learn connectivity activities and status being undertaken by PRRD at https://haveyoursay.prrd.bc.ca/rcs
- Partnering with the Canadian Internet Registration Authority (CIRA) in Spring 2024 to establish a PRRD Landing Page on the CIRA speed test site inside PRRD Connectivity webpage where PRRD inhabitants are able to run internet speed tests and the results for download speeds, upload speeds, latency and jitter by service provider are recorded to help build the case for better connectivity;
- Conducting an in-house cellular data coverage study, see Appendices Reference Documents and;
- Retaining Planetworks Consulting Corporation May 2024 to develop a current connectivity review, the subject of this report.

3.2 CONNECTIVITY POLICY CONSIDERATIONS

Most of the policies adopted by the Regional Broadband Committee remain unchanged since the Valo study was conducted. However, as technology changes so too do some of the narratives regarding the policies. Some new key messages include:

3.2.1 Broadband is now FTTP. While the CRTC set the Universal Service Objective goal of 50/10 in 2016 and measures progress against 50/10 until the campaign is due to complete, yearend 2027 for BC, all new access infrastructure is FTTP and scalable to speeds much greater than 50/10 with 1000/1000 available in the urban areas. There are access technologies that can deliver 50/10 or more including fixed wireless access, low earth orbit satellite, hybrid fibre coax but given the scalability, FTTP is the broadband technology standard in 2024**.**

3.2.2 Cellular is synonymous with personal safety. Most Canadians carry a cell phone. Cell phone coverage is essential to personal safety.

3.2.3 Broadband and cellular services must be affordable and accessible by all. Once the FTTP and cellular infrastructures are in place, especially if these infrastructures are built with government funding, the ISP's must have service package solutions available that remove financial barriers for low-income individuals and families to access these services. TELUS and Northwestel offer subsidies to eligible low-income households through the federal Connecting Families program to ensure affordability of internet access. TELUS Mobility under their "Mobility for Good" cell plan and Rogers under their "Connected for Success" cell plan are each launching subsidized cellular plans for eligible low-income individuals and families.

3.2.4 Telemedicine is essential to personal health in the PRRD. During stakeholder discussions, it was clear that due to shortages of doctors, nurses and other medical professionals telemedicine within the PRRD is more important in 2024 than ever before.

Previous studies occurred at a time when there was little service provider interest in extending 50/10 much less FTTP infrastructure throughout the PRRD. At that time, it looked as if the only way forward would be for PRRD to invest in telecommunications infrastructure. While this appears not to be necessary for broadband infrastructure, it may still be a requirement for the advancement of cellular infrastructure along the major PRRD highways. One of the major issues for highway coverage especially in more rural areas in the PRRD, is the availability of power. In fact, a condition for the current funding streams available through Northern Development Initiative Trust (NDIT) for cellular service providers to extend highway coverage, is the availability of power. One option for PRRD to ready certain highway segments for cellular service is to adopt a policy to support the extension of power along certain corridors and invest partially or fully to make the power extensions happen.

3.3 REFERENCES

The content of this report relies on public data collected from the November 2023 data sets behind ISED's **National Broadband Internet Service Availability Map** and other public data such as: ISED's cellular tower data; Census Canada and PRRD for household and civic counts respectively; Connecting Communities BC and other Provincial sites; the PRRD Landing Page on the CIRA site; the CRTC Broadband Fund; and the CRTC Connectivity Dashboard. In addition, Planetworks drew upon published reports, a list of which are included in the Appendix.

Planetworks corroborated the public data through discussions with stakeholders.

It should be noted that the **National Broadband Internet Service Availability Map** has defined the PRRD communities using hexagons or PHHs. It is on the basis of these PHH community definitions, that service providers can apply for and receive FTTP funding. During discussions with stakeholders, it was noted in a few cases that the definitions do not accurately reflect the communities. For example, the data set does not define an area for Jackfish Lake. It is possible for the PRRD to work with ISED and change the data but for the purposes of this report, Planetworks has used the ISED definitions for the communities which are listed in Appendices – Community List.

4.0 FIBER-TO-THE-PREMISES CONNECTIVITY

This section focuses on FTTP and addresses:

- the methodology used by Planetworks for the study
- the current technology landscape and alternatives
- FTTP cost metrics and,
- Capital and operational cost estimates to extend FTTP to the three larger communities not part of any FTTP funding application so far.

In addition, Planetworks has developed broadband connectivity dashboards (See appendix), status snapshots for each local government, as part of this report, with the objective that these dashboards can be updated annually to track progress.

4.1 PROJECT METHODOLOGY

The Planetworks team used a combination of publicly available information and stakeholder engagement discussions to gather the information necessary for this report. The emphasis on this report versus earlier studies was to determine connectivity status at the community level as a baseline that the PRRD could use against future studies to measure progress.

4.1.1 Publicly available information

Planetworks mined all publicly available data sources including: CIRNAC, Census Canada, ISED National Broadband Database, Cellular tower database, and other data bases, power, roads, highways, municipal boundaries, and the PRRD's GIS databases. The team then created a data set of connectivity information sortable by Electoral District, First Nation, communities needing FTTP, communities needing cellular, highways needing cellular, and broadband projects funded. This information was used to generate specific information and questions for stakeholders.

4.1.2 Stakeholder discussions

Planetworks focused the discussions by preparing and issuing a tailored PowerPoint slide deck in advance for each stakeholder interview. The presentation was tailored to each region, electoral district community and/or First Nation, and outlined findings by community for cellular and broadband connectivity, identified project plans for the area and identify potential funding sources and potential service provider partners.

Stakeholder discussions were held with: Each of Electoral Area Directors in the PRRD, PRRD GIS staff, the PRRD Broadband Internet and Mobility Committee, and individual service wherever possible a primary "user representative" contact from each community. Interviews were also held with selected service providers, funding agencies, and government entities.

4.1.3 Limited time frame

The project timeline meant that there was a limited window for interviews, which were conducted from June to August. The participation of interviewees was excellent, most were very happy to receive the data presented and to offer their individual perspectives on the status and importance of broadband services in their community. A few local government stakeholders were missed in this round of interviews and will be addressed as needed in follow-up updates in the future.

4.1.4 Key Messages from Stakeholders

In general, stakeholders confirmed that the data represented in the public databases reflected the local situation. There were a few exceptions which if not corrected in the data set would negate service providers from applying for FTTP funding for certain communities. One example is Tumbler Ridge which from stakeholder discussions and corroborated by community collected on the PRRD's CIRA Landing page, is not 50/10 and yet was reflected as 50/10 in the national dataset. Planetworks met with CCBC and forwarded a list of communities where the data was incorrect to the actual situation for CCBC and ISED to review.

Other messaging from the stakeholders reflected various levels of frustration regarding services to date. The stakeholders cited that the existing broadband services in the rural areas was either poor or non-existent. The same sentiment held true for cellular. Stakeholders in some of the larger communities such as Chetwynd and Tumbler Ridge expressed frustration with service providers making promises to extend broadband and not delivering, or starting broadband projects and not completing the projects. Almost all stakeholders expressed frustrations over service providers "cherry-picking" certain areas over others and being secretive about their plans.

4.2 FIBRE-TO-THE-PREMISES LANDSCAPE

The following section identifies the funders, the service providers, the technology and costing metrics for FTTP. Planetworks also offers capex and opex budgets for planning purposes for the three larger communities that are not part of any FTTP funding application.

4.2.1 Connectivity objectives

The clear objectives identified were to provide reliable, affordable, 50/10 broadband services to 98% of households in the PRRD.

4.2.2 Funding sources

The federal government established the Universal Broadband Fund and partnered with Provincial and Territorial governments to advance broadband infrastructure. The funding program in BC is branded Connecting Communities BC. Details are below.

Universal Broadband Fund

The Federal Government Universal Broadband Fund, administered by ISED, supports high-speed Internet projects across the country. These projects will bring Internet at speeds of 50/10 Megabits per second (Mbps) to rural and remote communities. The funding includes:

- up to $50 million for mobile Internet projects that primarily benefit Indigenous peoples, including projects along highways and roads where mobile connectivity is lacking
- up to $750 million for large, high-impact projects
- through a Rapid Response Stream for shovel-ready projects that can be completed quickly

The Universal Broadband Fund is part of the Government of Canada's coordinated plan to connect all Canadians: *High Speed Access for all: Canada's Connectivity Strategy*.

Connecting Communities BC

In a 50/50 funding partnership, the Government of BC and ISED Canada under the Universal Broadband Fund (UBF) launched an $830 million BC focussed program to fund eligible service providers to build FTTH to full-time Canadian residents living in unserved and under-served rural and Indigenous communities. The program is related to the $3.2 billion UBF but instead of being national, is centered on BC communities with the objective for all British Columbians to have access to at least 50/10 internet services by 2027. While the program is 50% funded by the federal government under the UBF, it is administered by the BC Government for projects in BC.

To be eligible for funding under the programs above, the service providers in addition to submitting very detailed applications which must include letters of support, must meet a variety of conditions. At present the most notable constraints of this program are:

- The application must include an experienced service provider with proof of at least 3 years' history operating the proposed technology in Canada and who must commit to operations and maintenance on an on-going basis for 5 years post project completion. If the provider ceases to operate the system, they must repay the awarded capital on a prorated basis.
- Funding is provided for up to 90% of project capital cost for First Nations and up to 75% of project capital cost for local improvement districts or incorporated areas. The balance of the project cost must come from the local improvement district, the service provider, other funding sources, or some combination of these.
- Customer Premise Equipment necessary for the service such as optical network units for FTTP are excluded from funding eligibility.
- Grants are awarded based on proposals with the most need, i.e., funding is granted to those communities with no broadband service today as a priority over those communities with partial service.
- For the Application to be considered, it must be fully complete. A qualified service provider must be identified before it will be evaluated for funding.

The CRTC Broadband Fund is another bucket of funding and seems to be used more often for complex projects crossing provincial and territorial boundaries and for servicing very remote communities. The FTTP funding for the projects in the PRRD will come from CCBC. Information regarding the CRTC Broadband Fund is included for completeness.

CRTC Broadband Fund

The CRTC Broadband Fund is a $675 Million fund derived from contributions collected from service providers having at least $10 Million in annual revenue and is administered by the CRTC. The CRTC Broadband fund addresses both the optical data transport to and the last mile within an unserved community and focuses on projects which have significant economic impediments. Like the CCBC, the funding addresses 90% of the upfront capital for a 10% match for projects to address service to Indigenous communities. It also focuses on cellular coverage to unserved highways in remote parts of Canada

4.2.3 Letters of Support from Local Governments

Telecommunications is regulated federally. The available funding for FTTP under CCBC is administered under federal funding rules in partnership with the Province. To ensure that service providers engage local governments and community leaders of the areas that they intend to service with broadband, the Funders above require proof of local engagement and support. For local governments, this comes in the form of a letter, for First Nations, in the form of a Band Council Resolution (BCR).

The Letters of Support or Band Council Resolution and the role that they play, the short turn-around times and service provider secrecy are all understandable issues and from our perspective, arise from the iterative funding process which is for a service provider to:

- develop a business case,
- apply for funding, (and get letters of support)
- evaluate what funding is awarded against the funding application,
- redo the business case based on the awarded funding, and,
- amend the rollout plans to match the revised business case.

Letters of Support are a relatively new requirement from CCBC to support their funding process and seem to have come into play for funding applications since the Valo report was written. Prior to that, service providers, being federally regulated and applying for federal funding subsidies, could submit funding applications without informing and engaging the affected local community. From our perspective, the Letters of Support provide the much-needed local community visibility and engagement.

While this requirement does force the service provider to approach the local governments for formal support, it does not obligate the service provider to share the details of their plans as this is often

viewed as commercially confidential information and the funding applications could be considered competitive with only one service provider receiving funding per community.

It is also understandable that some frustration can arise with the lack of project information supplied by the Service Providers along with their requests for Letters of Support. From our perspective, we understand the community frustrations in not understanding the detailed plans but also the service provider challenges in sharing information that likely will change during the funding process. There is no guarantee that service providers will receive funding as applied for and without funding there is no viable business case.

Consequently, secrecy arises as service providers are reluctant to share their plans and set expectations which they cannot deliver. The funding process is competitive with only one service provider being awarded funding per community. After the funding has been awarded, each service provider must revisit their business cases and determine specifically which community can be addressed and which omitted. This activity is done with the funder and applies even to those service providers that have shared detailed rollout plans with the PRRD. The rollout will likely be different to the application especially in the situation within the PRRD in 2024 where multiple service providers are applying for funding for the same communities, and each are using these same communities as the economic anchor to finance their remaining plans.

While we understand (not condone) the service provider motivations for secrecy during the funding application process, we do not understand the secrecy once the funding is awarded and announced. We believe that the service providers should be providing regular status updates to the communities on the roll out. This rollout visibility for communities we believe is essential to ensuring whole areas are built out as awarded and the situation avoided where sub-areas are cherry-picked. We recommend that the PRRD explore with CCBC how funded service providers can be forced to share their roll out plans once funding is awarded, and to provide regular status updates.

4.2.4 Eligible FTTP Service Providers

To qualify for the various government grant programs, service providers must be companies who have proof of experience delivery services for least 3 years operating FTTP in Canada. They also must commit to operations and maintenance of the service installed on an on-going basis for 5 years post project completion. If the provider ceases to operate the system, they must prove that they could repay the awarded capital on a prorated basis. The key service providers capable of providing FFTP and meeting the funding eligibility requirements for the PRRD are listed below. Note that there are many fixed wireless access (FWA) operators currently providing service with the PRRD who are not itemized in the list below, including both Peace Region Internet Society (PRiS) a not-for-profit internet society and Vincent Communications, a for-profit company serving as two examples. These FWA companies have provided service for many years, have loyal customers and are expected to continue providing service even as the FTTP is deployed by other service providers. FWA service providers are depicted in the **National**

Broadband Internet Service Availability Map data set as 25/5 although under certain conditions 50/10 or higher is possible.

TELUS

Telus Corp (TELUS) provides a range of wireless and wireline telecommunication services across all Canadian provinces and some territories. The company offers a wide range of communications products and services including voice, data, mobile, IP services, television, video and security internet, entertainment, unified communications conferencing and collaboration, security consulting and managed services, cloud and managed information technology services, home and business security and automation services, and cloud-based solutions. The company also provides a virtual healthcare IT solution, Telus Health. Telus operates under the brand names of Koodo Mobile, Optik TV, Pik TV, and GoCo. Telus is headquartered in Vancouver. TELUS currently offers DSL, FWA and FTTP broadband services to certain communities within the PRRD.

Northwestel

Northwestel, is the primary telecommunications service provider in Canada's North and is a currently a wholly owned subsidiary of Bell Canada Enterprises (BCE). The company offers a wide range of communications services and products including voice, data, television and IT cloud services. Their service area is entirely situated above 60 degrees of latitude across Canada, but they do have some service areas in northern BC and the PRRD. Northwestel operates as a monopoly service provider in their service area under CRTC regulation and charges Tariff rates set by CRTC regulation. BCE Northwestel have recently announced the intended sale of Northwestel to Sixty North Unity in June 2024, a consortium of Indigenous communities from Yukon, Northwest Territories and Nunavut. If the sale goes ahead the company will become the largest fully Indigenous owned communications company in the world. Northwestel currently offers DSL broadband services to certain communities within the PRRD. The company has recently placed applications to CCBC for FTTP service expansion in the PRRD.

Rogers

Rogers Communications is a national wireless and cable television service provider. In 2023, Rogers was granted approval to acquire Shaw Communications, which has significant telecommunications holdings in western Canada. As part of promises to the CRTC to support the acquisition of Shaw, Rogers pledged to spend $1,000M on service expansion in rural areas in western Canada, $500M of which is in BC. With acquisition of Shaw, Rogers gained HFC systems in certain communities within the PRRD.

Canadian Fibre Optic

Canadian Fibre Optics is a privately owned company headquartered in Calgary Alberta and offers services Alberta abutting PRRD. The company has recently placed applications to CCBC for service expansion in the PRRD.

4.2.5 Interim Role of LEO Satellite

There are several providers of LEO satellite for broadband internet which may provide interim services. Primarily these are: Starlink, Lightspeed, OneWeb and Globalstar. Only Starlink is a consumer service and available to residences and businesses direct. The reminder are wholesale services available to service providers and due to their pricing, are used by service providers for alternative transport measures. In the PRRD where there is fibre transport available or soon-to-be available, these wholesale solutions will have limited application. They are included below for completeness.

Starlink

Starlink is a residential service and leads the broadband LEO internet market, by a large margin with over 6,200 satellites in operation and over 3 million subscribers worldwide. The number of satellites and subscribers continues to grow at a rapid pace. The service offers broadband service with low enough latency to allow for video conferencing. Downlink speeds of up to 300Mbps is possible with 100Mbps typical.

Telesat - Lightspeed

Telesat is planning to launch a wholesale LEO service for service providers. The service providers would be responsible for the access network connectivity. A firm date for Telesat's lightspeed service launch is currently unknown, however current estimates indicate that this service will not be available before 2027.

Eutelsat - OneWeb

OneWeb offers a wholesale LEO service for service providers that provides faster broadband transport service to ISPs and larger clients such as governments. Like Telesat Lightspeed, OneWeb is not available to residential or business consumers direct. The service is available, but bandwidth is restricted to 100's of Mbps and not currently scalable to Gigabit speeds.

Globalstar

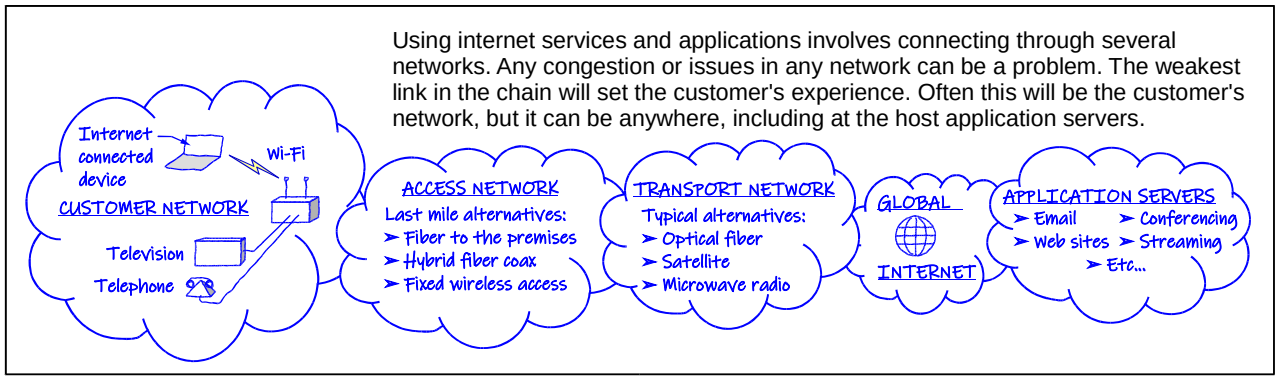
Apple Device Messaging via Globalstar See section 5.3.4 for details of this service

4.2.6 Internet Quality of Service and Chokepoints

Quality of service for internet users generally breaks down to just two factors: first, is the internet working (available); and second, is it fast enough for current purposes. Fast enough relates to data speed which is measured in bits per second (bps) and is usually expressed in megabits per second (Mbps) which is one million bits per second. The CRTC objective of 50/10 means at least 50 Mpbs down to the user and 10 Mbps up to the network.

How fast is fast enough for a user's current purposes will depend on the application being used, such as e-mail, web browsing, streaming video, video conferencing, file download or upload, etc. Each of these applications requires at least a certain speed to work well for the user. Each of these applications will

rely on a host computer or server somewhere that provides the service or application. Reaching that server involves connecting through several networks, typically: the user premises network (usually Wi-Fi); access network; transport network; global internet; and finally, the application server.



Any one of these networks or the application server may be a speed bottleneck if there is more traffic demand than the network or server can handle. Quite often, the customer's Wi-Fi network is the bottleneck because too many users and applications are trying to use the Wi-Fi at the same time, or the Wi-Fi is degraded because there is interference from neighboring Wi-Fi networks, or a combination of both.

The internet service provider's responsibility ends at the demarcation, which is usually a fiber connector in a small box, the optical network unit, inside the side of the customer's premises. The customer's network, which is usually a Wi-Fi access point radio, is the customer's responsibility. Unfortunately, it is not simple to troubleshoot and resolve interference problems—the most common issue.

4.2.7 Cost Metrics

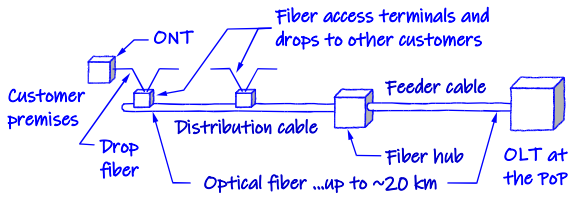
This subsection provides high-level guidance cost ranges for broadband based on 2024 dollars and current pricing for fiber transport (backbone) and last-mile fiber to the premises (FTTP). Costs for these network components are considered separately. Transport costs are those needed to lay and light fiber from an existing transport network presence to a community (cluster of dwellings, businesses and institutions). FTTP costs are those needed to extend the fiber from the end of the transport to the customer's premises in the community. FTTP without fiber transport will generally mean that internet speed performance will be limited by the backhaul. Therefore, both are needed, and one without the other can be a limitation.

4.2.8 Transport Capex

The capital expenditures (capex) for a fiber transport build in the PRRD, expressed as the average cost per meter (m), may range from $77 per meter to S175 per meter with $110 per meter as a reasonable

typical or median value. For example, a 100 km fiber build may have a one-time cost on the order of $120 million, plus 60% or minus 30%.

Fiber transport systems comprise outside plant cable, optical transport equipment (inside plant), support facilities (equipment shelter/floor space, HVAC, power, security provisions) and an allowance for remote alarms and network management.



Fiber to the premises access networks connect from an optical network terminal (ONT) on the customer's premises, through a drop fiber, then over distribution and feeder cables to reach the optical line terminal (OLT) in the point of presence (PoP).

4.2.9 FTTP Capex

The capital expenditures for a FTTP build, expressed as the average cost per passed premises (pp) away from the main population centers in the PRRD, may range from $7,000 per passing to $16,000 per passing with $10,000 per passing as a reasonable typical or median value when averaged across a large enough sample. For example, a community with 100 premises may have a one-time cost on the order of $1 million, plus 60% or minus 30%.

FTTP networks comprise outside plant cable (passive optical network) that connects electronics , referred to as Optical Line Terminations (OLTs) in the network point of presence (PoP, or central office, or head end) to electronics in the customer's premises, referred to as the Optical Network Unit (ONU) and to inside plant at both the PoP and the customer ends.

The outside plant is usually considered in two parts: (i) feeder and distribution cables that run along the streets and roads; and (ii) the drop cable (or lateral) that spurs off the distribution cable to reach the customers' premises. All of the drop cables may or may not be run with the initial build—discussed below under "Take-rate."

Inside plant at the PoP there will include optical line terminal equipment (OLT) that interfaces with the outside plant fiber and a gateway router that interfaces with the transport system. The PoP will also include support facilities (equipment shelter/floor space, HVAC, power, security provisions) and an allowance for alarms and network management. At the customer end there will be an optical network terminal (ONT) that converts the optical signal to Ethernet and in some cases to a phone line, cable television signal and Wi-Fi radio signal.

Note that if the transport cost to reach a small remote community is included in the cost per premises passed, this cost metric escalates quickly with increasing transport distance and decreasing community size.

4.2.10 Capex Cost Factors

The above cost ranges are inclusive of planning, design, procurement of goods and services, construction, installation, testing, commissioning, project management, and incremental allowances for training and spares. These may seem like wide ranges. However, a review of the following general factors will provide insight into the many factors that will come into play, pushing costs, upward or downward, toward the ends of the ranges.

- **Scale:** Bigger projects with higher volumes will have lower unit costs through economies of scale. When compared to a series of smaller projects, one big project will benefit from volume procurements, fewer mobilizations and often more competition.
- **Continuous area:** Projects in a single contiguous area or a connected set of areas will have lower unit costs than projects that have widely scattered components.
- **Schedule:** Projects that have to factor in delay and/or delay risk will have higher unit costs through, for example, added mobilizations and standby time. For delays over one year, material and labor price escalation will often increase unit costs and may result in the need to reduce scope and scale if funding cannot be increased.
- **Competition:** The amount of competition will depend on the availability or scarcity of the relevant goods and labor, and whether or not the procurement process and documentation facilitates or impedes competitiveness. Obviously, more competition should result in lower unit costs.
- **Procurement strategy:** In addition to influencing the competitive response, procurement strategies can affect the distribution of risk. Contract packaging, scope and terms that upload risk to the contractor will increase costs compared to approaches that share the risk.
- **Remoteness:** The type of physical access to reach the project area and conditions will affect the cost of moving material and crews. Short distances to large regional centers on paved highways will lower costs. Conversely, long distances over seasonal roads, or using barge or air transport, will raise costs.
- **Regulations and permitting:** The requirements for permitting vary by jurisdiction. Permits may require consultation with one or more stakeholders and different levels of assessment for environmental, heritage, archeological and cultural impacts. Depending on ownership, land use and right of way acquisition may involve negotiations and added cost. More regulatory and permitting complexity adds directly to costs and indirectly to costs through delay.

Underground or overhead cable construction: In general, installing overhead cable on existing pole line structures is lower cost than new underground conduit construction. However, the difference is not clear cut. The condition of existing pole lines, and the policies and procedures for joint-use can add significantly to cost directly and indirectly through delay. For example: a BC Hydro joint use pole line is often used to support FTTP but to in order to install the new lines service providers must first design their system, then apply for permits to attach to the joint use poles. BC Hydro currently quote 24 months as the time needed after permit application until work installing the lines can start.

This two-year delay can expose the project to inflationary pressures. In addition, the condition of existing joint use pole plants is often not well documented and must be taken to carefully survey the condition of the existing pole plant to identify and quantify costs need in order for the pole plant to support the new services.

Existing infrastructure: the presence of existing infrastructure can work for or against a project. The presence of pole lines and underground conduit that are not encumbered with complex joint-use agreements or involve costly make-ready will reduce unit costs. On the other hand, new builds with road, railway and pipeline crossings will increase construction and permit costs with underground typically impacted more than overhead especially if a “Dig-once” policy isn’t established in an area.

Surface and subsurface conditions for underground conduit construction: Conduit placement in good soil conditions can be plowed at low unit cost. The presence of stones and rock significantly increase conduit placement unit costs–the amount depends on the degree of stoniness (size and spacing of stones) and rockiness (relating to the exposure of bedrock). Every road, rail and pipeline crossing will add cost. Water crossings also add cost for horizontal directional drill shots, and if the water body is large enough, submarine cable may be required. Cable trenching will disturb the surface and may require vehicle traffic management (flagging operations). Urban areas may use horizontal directional drilling extensively to reduce the cost of surface penetration and restoration.

Source of funds: Subsidy funding is required to make the business case. Government funding programs are encumbered with significant procedural costs and delay. If more than one funding source must be tapped, there will be delay if fund approvals and releases cannot be aligned. Network component alignment can be an issue when transport and FTTP are separate projects under different funding sources. In fact, initial investments become stranded with no revenue generation capability until all networks are complete.

New or existing operating entity: Existing network operators will have potential benefits from existing supplier agreements, and network and customer management functions will have small incremental costs for existing network operations center (NOC) and back-office infrastructure.

4.2.11 FTTP Specific Cost Factors

The above are general factors that are common to all types of fiber build projects. The following are factors that are specific to FTTP.

- **Customer density:** This is a dominant cost factor for FTTP and is usually expressed in terms of the number of premises per square kilometer which relates, in turn, to the average spacing between premises. Obviously, premises that are closer together (short average spacing between customers) will have lower cost from shorter fiber route construction distances.
- **Customer take-rate:** The stated cost ranges include a drop cable to every customer's premises. This assumes a 100% take-rate. Although not universally true, new builds are tending to provide a drop to every building to minimize the future cost of adding the customer. When potential future customers

refuse access to their property, present costs go down a bit and potential future costs go up a lot. The allowance for the drop in the total cost, ranges between 500 $/pp and 1,500 $/pp, depending mainly on the drop length. Obviously, drop length is shortest in dense urban areas and longer as density decreases.

4.2.12 Operating Expenditures

Annual operating expenditures (opex) includes costs for: (i) network operations center (NOC) staffing and facilities; (ii) back office operational support systems (OSS) and business support systems (BSS) staff and facilities; (iii) maintenance (preventive and corrective); (iv) site and rights of way fees and leases; (v) joint pole use fees; (vi) energy (power consumption); (vii) internet transit fees; (viii) equipment support agreements; (ix) insurance; and (x) normal business expenses for office staff and space.

The annual opex will vary widely depending on how each of the above cost items are accomplished and on the scale of operations. Also note that higher capex can result in lower opex; for example, spending more on high quality construction will require less ongoing maintenance and spending more on equipment that is easier to provision, manage and maintain should have lower ongoing labor costs.

Estimating opex is usually based on modeling specific situations. Providing a simple metric to cover a range of situations is more difficult. Nonetheless and in very rough terms, from a range of models that cover situations similar to those encountered in PRRD, assuming a 100% take-rate and after removing outliers, the annual opex per passed premises may range from under $600 to about $2,000 for communities ranging in size from 50 to 2,000 premises. Communities with over about 500 premises, should be less than $1,000 per year per passed premises. For communities under 500 premises, annual opex can be under $1,000 but range upwards to the $2,000 mark depending on a range of factors, including the average distance between premises and the amount of transport that must be maintained.

Revenues are required to cover these operating expenditures. If all premises passed subscribe to services (100% take-rate), then at $100/month per customer, annual opex costs should be recovered (from $100 per month for 12 months = $1,200 revenue against $1000 operating expenses). If only 50% subscribe, then $100 per month will not be enough.

Subsidizing recurring costs from external sources, such as the public treasury (taxpayers) or universal service funds, is generally not considered sustainable (no long-term business case which means, if the subsidy is not maintained at a high enough level, the service will become unaffordable and fail). The exception in Canada has been subsidizing the space segment for satellite-based service to rural areas.

In theory, even if capital is grant funded, revenues should enable capital cost recovery for eventual infrastructure replacement. Most equipment will require replacement (refresh) every 7 to 15 years depending on the class of equipment and manufacturer support. The fiber cable plant should have a book value of at least 20 years and perhaps as much as 30 years. The fiber will typically have a 20-year manufacturer guarantee, but cable jacket and structural performance will degrade over time that will depend on the type of construction and exposure to damage and the elements.

4.2.13 Closing Remarks

Network development decisions should be based on life cycle costs, combining capex and recurring annual opex across a sufficiently long study period using discounted cash flow methods. The current government fiber connectivity programs provide subsidized capital and will generally favor lowering recurring costs over lowering capex.

Cost is not the only factor considered during design. Although beyond the scope of this discussion, reliability and resilience to natural disasters are also considerations during system planning and design. This can influence sites, routes and construction (overhead versus underground).

Every project will have unique aspects and many cost factors will come into play in various ways. These factors cause cost increases and decreases with an expectation that the figures will usually fall within the ranges noted. Bigger projects will tend to have unit costs closer to the typical or median values.

Extending economies of scale from projects to the entire serving area of a network service provider, it should be obvious that bigger contiguous serving areas has advantages. Mixing profitable high-density areas with unprofitable low-density areas, allows the network operator to internally cross subsidize. The amount of internal cross subsidy that can be maintained will depend on how much competition the operator faces in the profitable areas. Economies from scale will generally lead to smaller telecommunication operators eventually being taken over by larger. History shows this happened to telephone service providers, internet service providers, and cellular mobile providers. With fewer bigger operators and recognition that the service has economic and social benefits, a need to regulate emerges in order to impose, for example, minimum quality and universal service obligations. There is no real lesson here—just an understanding of how underlying forces set the industry as a whole on certain trajectories.

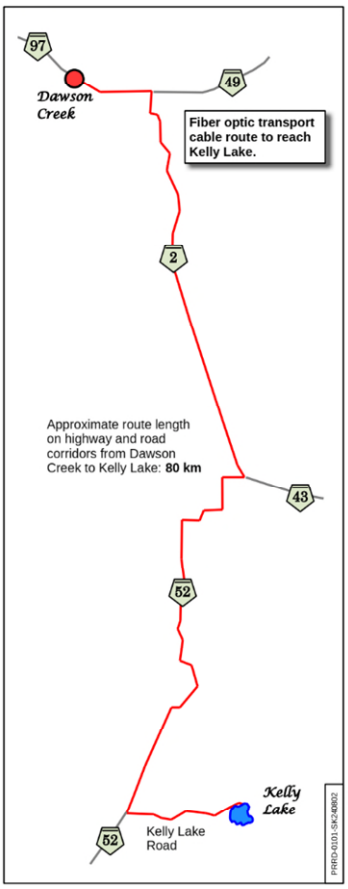
4.3 FTTP CAPEX AND OPEX BUDGETS FOR UNADDRESSED COMMUNITIES

In total, there are eight communities unaddressed by FTTP or FTTP funding applications in 2024. These include five Ranches, each with less than 20 civic addresses in Electoral B and D including: Halfway Ranch, Beatton Ranch, Boring Ranch, Brady Ranch, Simpson Ranch plus three larger communities: Kwadacha Nation, Tsay Keh Dene Nation (Area B) and Kelly Lake (Area D). We recommend that the ranches be served by LEO satellite (if not already).

The remaining three communities will need both fibre transport and FTTP last mile. High level budgets are included below. These budgets are meant for planning and discussion purposes only and will need to be revisited by the service provider as part of their planning processes for the funding applications.

4.3.1 Kelly Lake

Kelly Lake is a small community about 80 km south of Dawson Creek. The project data base indicates 59 potential customer premises (civic addresses) and a population of 80.



Transport Fiber

As shown on the sketch map, about 80 km of transport fiber placed along existing highway and road corridors would reach Kelly Lake from Dawson Creek. A rough order of magnitude (ROM) estimate of the total cost for fiber transport to Kelly Lake in 2024 dollars is $9 million with low and high error bounds at $6 million and $14 million (90% probability range). Refining the estimate and narrowing the low and high error bounds requires additional engineering.

Access Fiber to the Premises

A ROM estimate of the total cost for a fiber to the premises access network build for broadband internet in the Kelly Lake community in 2024 dollars is about $650 thousand with low and high error bounds at $450 thousand and $950 thousand (90% probability range). This estimate assumes and considers that: (i) the cable would be overlashed on existing power pole lines; and (ii) service is extended to all premises (i.e., allows for 100% take rate).

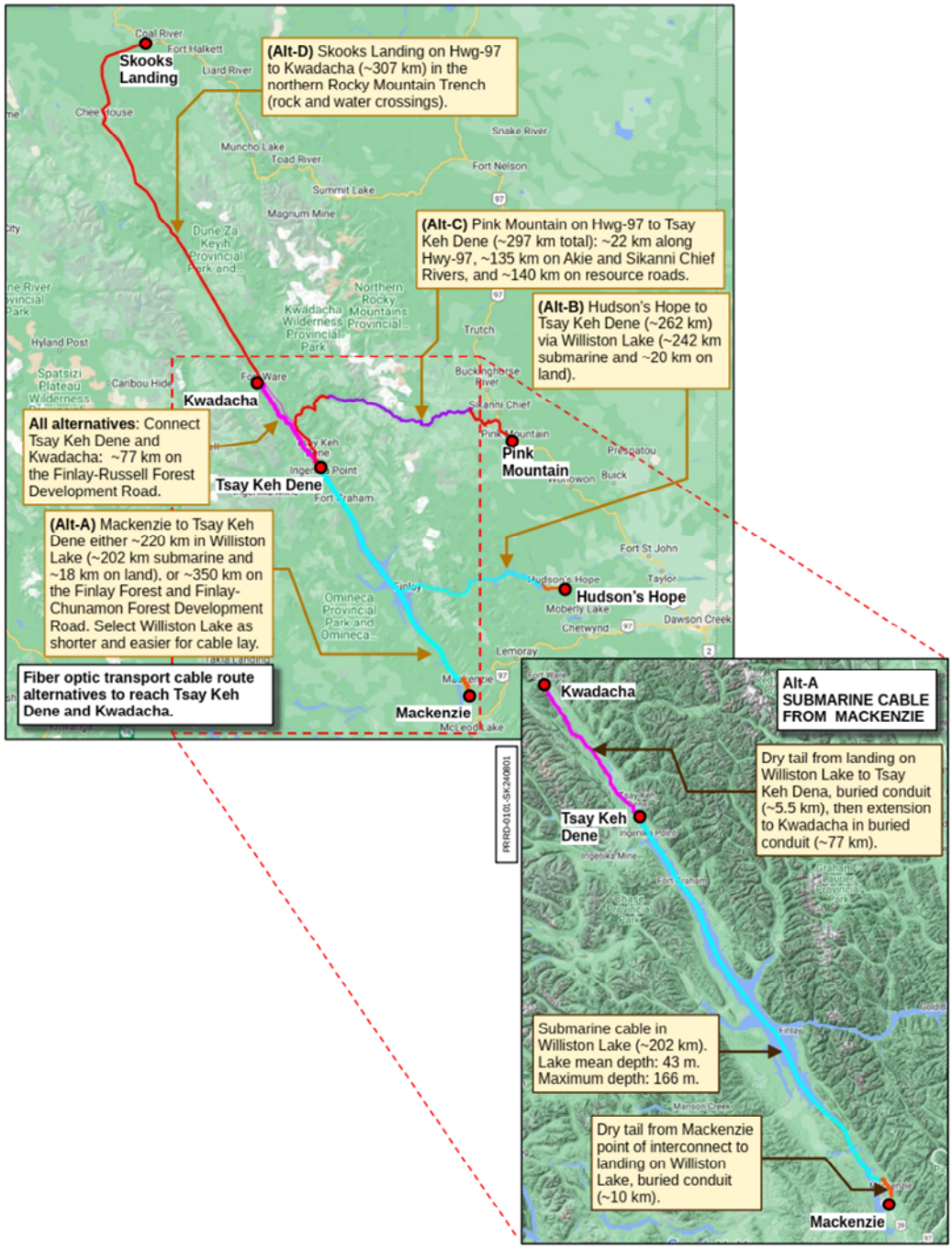
4.3.2 Kwadacha and Tsay Keh Dene First Nations

The Tsay Keh Dene Nation and Kwadacha Nation are located on the Finlay River. The Finlay flows into Williston Lake in the northern Rocky Mountain Trench. The two communities are connected by the Finlay-Russell Forest Development Road (about 77 km). The communities are remote. Therefore, the transport fiber will be the dominant cost. The obvious transport solution is for the two communities given their proximity to the share a transport fibre link. Currently both communities have different telecom incumbents – Kwadacha with Northwestel and Tsay Keh Dene with TELUS. For the communities to share a common fibre link, it is likely that one of the communities may need to change its telecom incumbency. This issue is outside the scope and is flagged for completeness.

Given the proximity of the two communities to each other, and excluding any potential regulatory issues, it would be cost effective for the two to share the same transport fiber, and logical to develop the costs for both jointly.

Transport Fiber

Map View



As shown on the map view, a range of potential fiber transport routes were reviewed. Note that a route to the west was not considered as it would involve traversing a mountainous region with no obvious

path to follow. Of the alternatives considered, (A) with submarine cable in Williston Lake from Mackenzie, was selected as a basis for a rough order of magnitude (ROM) cost estimate. As shown on the map view, this alternative is the shortest. There is an existing barge and water transport operator on Williston Lake (Cho Cho Industries). This alternative should be the lowest cost and benefits from path diversity to the internet from Mackenzie to Edmonton and to Vancouver.

A ROM estimate of the total cost for fiber transport to both communities in 2024 dollars is $34 million with low and high error bounds at $24 million and $55 million (90% probability range). This estimate considers that the submarine cable will have a low cable lay cost but overall, there will be high costs for mobilization, cable landings, remote area construction, and stretch span optical transport equipment with high power Raman pump amplifiers. In addition, the submarine cable route will typically have long lead times and high costs associated with permitting. Refining the estimate and narrowing the low and high error bounds requires additional engineering.

Access Fiber to the Premises

A ROM estimate of the total cost for a fiber to the premises access network build for broadband internet in each community in 2024 dollars is shown on the following table. This estimate assumes and considers that: (i) the cable would be overlashed on existing pole lines; (ii) service is extended to all premises in the community (i.e., allows for 100% take rate); (iii) construction is in a remote area; and (iv) permitting costs should be low (under First Nation control).

Table Rough order of magnitude (ROM) cost for fiber to the premises access network build. Refining the estimate and narrowing the low and high error bounds requires additional engineering.

	Parameter (units)	Tsay Keh Dene	Kwadacha	Total
1	Estimated population	220	242	462
2	Number of customer premises	111	126	237
3	Total distribution road length (km)	6.8	4.5	11.3
4	ROM cost estimate, typical ($M)	**1.23**	**1.26**	**2.49**
5	Cost estimate, low error bound ($M)	0.67	0.76	1.43
6	Cost estimate, high error bound ($M)	1.56	1.77	3.33

4.4 REGIONAL CONNECTIVITY DASHBOARDS

Attached in the appendices are individualized connectivity dashboards which by local government, summarize the FTTP and 5G connectivity status. Each dashboard includes individualized recommendations for next steps, mostly focussed on FTTP advancements given the readily available funding for FTTP service providers.

Dashboards are included for the eighteen governments within the PRRD for completeness including those like Ft St John and Dawson City that have both FTTP and 5G services today.

4.5 RECOMMENDATIONS AND NEXT STEPS

Planetworks advises the PRRD to monitor the progress of service provider grant applications with agencies like CCBC and CRTC and to receive regular updates from providers on buildout activities. Planetworks also recommend reviewing the appended connectivity dashboards once grant applications and activities are available from funding agencies. Additionally, Planetworks suggest that the Broadband Internet and Mobility Committee ask staff to verify that completed projects align with the service providers' grant plans and meet or exceed the 50/10 service standard. (See Section 2.2 for detailed recommendations)

5.0)CELLULAR CONNECTIVITY

The following section focuses on cellular connectivity within the PRRD. Unlike the broadband rollouts to communities, there are no funding programs to address in-community coverage, which for most of the 88 communities within the PRRD, means no in-community 5G services are available today. Mobility services are increasingly becoming synonymous with personal safety especially for people driving in remote areas. Consequently, this section focuses on highway coverage.

5.1 BACKGROUND

The CRTC has been following cellular connectivity and has a goal that by 2030, the latest generally deployed mobile wireless technology (currently LTE [long-term evolution]) should be available not only in Canadian homes and businesses, but on as many major transportation roads as possible in Canada. The **CRTC Universal Broadband Objective Dashboard** at https://crtc.gc.ca/eng/internet/internet.htm tracks the progress and states that 99.4% of Canadians by population have access to LTE or better, while 87.2% of the major transportation roads and highways are covered, and 91.7% of rural communities are covered. This is optimistic for Northern BC and the Far North.

On April 23 2024, the BC Government released a report on connectivity in which cellular was addressed as well as broadband: https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/services-policies-for-government/initiatives-plans-strategies/internet-in-bc/pdfs/2024_bc-connectivity-benchmarking-report_apr23_2024.pdf The report states that 99.12% of the population have access to LTE or better. Access to cellular can be confusing given that a significant percentage of the Canadian public have a cell phone and use Wi-Fi connections when cellular service is not available. As with broadband, population views are more optimistic than community views as the communities with the greatest populations are served first. BC does not publish a community view. In their report though, the BC Government did identify that of the 15,000 km of primary and secondary roads, some 4,800km are unserved with some 3,100km also lacking available power. Most of the unserved highway segments in the PRRD do not have power and fall into the latter category.

Cellular services have evolved over the years with 5G being the most current technology. The groups of cellular technologies are described below:

- **5G: Current panacea for cellular service.** 5G technologies currently have peak data rates of up to 1,000Mbps, with 200Mbps being typical in the urban centers currently and is purported to be scalable to 20Gbps or more. It is characterized by small cells, typically less than 5km in radius but given user densities and promised downstream data rates, smaller cell radii are necessary. Essentially, for a community to have 5G services, there must be a cell tower in town. During a recent project where we analyzed First Nations connectivity, we advocated for 5G services to be deployed in communities with limited or no broadband as an interim step to FTTP. 5G has lower latency than LTE and LTE-A.

- **4G and variants (LTE and LTE-A).** Less throughput than 5G. From a user perspective there is a minimal difference in the experience with 5G unless using applications sensitive to delay. 4G is capable of internet roaming, video streaming as well as voice.
- **3G.** Old technology is characterized by very large cell radii – typically in the order of 10's of km. 3G is good for voice services and texting.

Cellular services are competitive and mainly fall outside CRTC regulation. The CRTC decided they must be involved to ensure roaming between competing service providers for safety. By legislation, all 911 calls must be processed by a cell site regardless of which service the customer is subscribing to.

This section examines the current issues, and potential resolution activities, associated with commercial cellular coverage within the PRRD. Particular emphasis is placed on the following major road segments with low service levels:

- Highway 97 between Pink Mountain and Northern PRRD boundary (South of Prophet River)
- Highway 97 between Chetwynd and Western PRRD boundary
- Highway 29 between Tumbler Ridge and Chetwynd
- Highway 52 between Tumbler Ridge and Highway 52&97 intersection

5.2 PROJECT METHODOLOGY

5.2.1 Approach

The following methodology is used in analyzing current cellular coverage:

- Existing cellular sites are determined based on spectrum licensing information contained in Industry, Science, and Economic Development (ISED) Canada's Spectrum Management System (SMS) database. While this should be the definitive source of information, data entry by cellular carriers or retention errors by ISED are possible. A high-level review of this data indicates that it is generally correct and aligns with other sources of information and stakeholder review comments.
- Based on a simplified Radio Frequency (RF) coverage approach whereby the aggregate coverage from all carriers is used when considering coverage. This aggregate coverage should be reflective of coverage for 911 emergency calls given intercarrier agreements for emergency calls. Non-emergency call cellular coverage may be less depending on a subscriber's carrier of choice.
- Based on key RF parameters from ISED's SMS database cellular coverage is modelled based on Planetworks' RF coverage modelling tool – EDX SignalPro. Coverage modelling utilizes the National Resource Canada's digital terrain elevation database.

The following approach was used for determining quantity and locations of potential new cell sites to fill cellular coverage gaps:

- Highways with cellular gaps were prioritized to address safety concerns. Gaps identified by coverage modelling and through Stakeholder consultations

- Where possible potential sites were located nearby communities to provide in-Community coverage. This was considered a second level priority – to be addressed following fibre to premise deployment
- To the extent possible, potential cell sites were located nearby to existing highways/roadways and in areas with commercial or third-party power availability to reduce cell site capital and operating costs.

5.2.2 Coverage Versus Congestion

It should be noted that the availability of cellular service is dependent on having i) sufficient RF signal and ii) sufficient availability capacity at a cell site. As a starting point, this analysis only considers the requirement to have sufficient RF signal.

The configuration of sufficient capacity must be addressed by the service providers once the RF coverage is determined. It is possible to be in excellent coverage zones and still not have service due to capacity. Because capacity is a service provider issue to address customer demand on the network, it is a second-order issue, with cellular carriers providing additional spectrum or sites to manage demand in high-volume areas. While insufficient capacity can result in dropped calls and subscriber satisfaction issues it is typically less of an issue from a safety perspective as 911 calls have priority over other calls.

5.2.3 Key Messages from Stakeholders

The following represent key observations from the stakeholder meeting regarding cellular coverage:

- Reliable cellular coverage on highways is a major safety requirement and is considered to be essential for personal safety.
- Direct Satellite-to-Phone (e.g. iPhone 14 and newer emergency texting via satellite services) while providing some relief, does not currently satisfy stakeholder highway safety requirements.
- Stakeholders currently do not consider cellular service on the major highways outside population centers to be sufficiently reliable
- Cell phone coverage within communities is also important for safety, (many residents now are dropping landlines where in community coverage is effective) however reliable highway coverage is considered relatively more important than in-community coverage

5.3 CELLULAR LANDSCAPE

Traditionally, cellular carriers have built out their coverage footprint to differentiate themselves from competitors to increase revenue, market share and/or number of customers. However, over the last five years a number of factors have arisen which has caused coverage footprint expansion to slow, including:

- Subscriber market saturation. A significant portion of the population has cell phones and carrier customer shares are relatively stable.
- Consolidation / acquisition. A number of smaller cellular carriers have been purchased by larger carriers resulting in reduced competition (e.g. Rogers purchase of Shaw)

- Inter-roaming agreements. Carrier service partnerships reduce service level distinction between competing carriers (e.g. Bell/Telus agreement to share cell sites and infrastructure)
- Downward cost pressure. While cellular rates in Canada are high from a global perspective, the carrier's ability to further increase rates is restricted.
- Increased traffic. Within the current cellular footprint, consumers continue to use more data and expect higher data rates. Carriers tend to focus on increasing capacity (additional spectrum and in-fill sites) within their coverage footprint and major population areas to keep up with this capacity and speed demand.
- Competitive equilibrium. Canadian carriers are unlikely to take major risks to change their current competitive landscape and appear happy to maintain their status quo. The ability of external market disruptors is limited due to Canadian regulatory requirements and the relatively small Canadian market size.
- Direct Satellite-to-Phone emergency services. The promise of this technology/service has reduced pressure on carriers to address service in remote areas.

5.3.1 Funding Streams

As noted above, cellular carriers have limited incentive to make further, major investments in increasing their coverage footprint in rural and remote areas. As a result, carriers do not appear to readily allocate significant internal capital and operating funds to expansion of their existing service area.

Recently, many cellular expansion projects in remote and rural areas have been accomplished through external funding sources or pressures, including the recent build-out by Rogers along the Highway 16. Subsidies for upfront capital are available from:

- Northern Development Initiative Trust (NDIT) and Province of BC. Capital funds for cellular coverage improvement along unserved highways with access to power; and
- CRTC Broadband Fund. Capital funds for improvement of fixed and wireless broadband services within communities.

It should be noted that the NDIT and CRTC funding sources do not address ongoing operational costs associated with the expansion of the cellular service footprint. While this funding is certainly helpful, it does not address ongoing cellular site operational costs. In Planetworks' recent experience with other Clients and confirmed again during the PRRD stakeholder interviews with service providers, the service providers view that the upfront capital funding alone is insufficient to warrant new cellular site builds and require that 5-10 years of site operational costs also be externally funded. Consequently, uptake for the cell tower funds from NDIT for highway coverage within BC has been comparatively low because with almost 100% of the population having access to cell phones, the addition of new cell sites to provide cellular coverage only adds expense costs to the service providers and no new revenues. Cellular service is competitive and any activity that adds to company expense diminishes the company profitability and stock prices. Consequently, cellular service providers are looking for operational subsidies in addition to capital subsidies to provide coverage to unserved areas. This is an industry issue

and under review with the CRTC. Operational subsidies are the subject of a CRTC Telecom Notice 2023-89 Call for Comments Broadband Fund Policy Review: https://crtc.gc.ca/eng/archive/2023/2023-89.htm. Until the operational subsidy issue is resolved, a process that will likely take at least 2 years, there will be little interest by any cellular service provider to extend their coverage.

As part of promises made to support Rogers' Shaw Purchase Undertaking by investing in connectivity for rural, remote, and Indigenous communities, including unserved and remote highways in Western Canada, Rogers will expand cell service in Northern BC. They received up to $5.47 million from the Connecting British Columbia program toward the estimated $6.4-million cost of filling in cellular gaps along 68 kilometres of Highway 97 between Chetwynd and the Highway 39 junction. The route includes Pine Pass, a sparsely populated area prone to avalanche conditions. Cellular service will also be made available at the West Pine rest area and Powder King Mountain Resort. See announcements at: https://about.rogers.com/news-ideas/rogers-brings-critical-connectivity-along-highways-95-and-97-in-british-columbia/ and https://news.gov.bc.ca/releases/2021CITZ0031-000814. It is interesting to note that all of the Rogers cell sites for this new build are not yet in the ISED database.

5.3.2 Service Providers & Relationships

In the PRRD, the following cellular carriers are active and maintain their own cellular infrastructure:

- Bell Mobility
- Rogers Mobility
- TELUS Mobility

As noted above, Bell and Telus operate under a service partnership agreement, whereby cell sites in the Northern regions of PRRD are operated by Bell and those in the southern areas are operated by Telus. Bell and Telus subscribers are able to operate seamlessly on the collective set of Bell and Telus sites.

Rogers operates an independent set of cellular sites and infrastructure. Within the PRRD region, the Rogers cellular site count is approximately 30% of the Bell and Telus aggregate site count. However, Rogers has negotiated an extended roaming agreement with Bell which permits the Rogers' customers seamless use of the Bell cellular services. At the time of this report generation, it has not been confirmed whether this agreement extends to Telus' sites.

Roaming agreements exist within all three carriers to permit 911 calling across any of the cellular networks when the subscriber's home network is not available.

5.3.3 Challenges for Cellular Coverage in PRRD

The PRRD region represents a particularly challenging environment for the expansion of cellular coverage footprint due to:

- Very large geographic area
- Sparse population
- Limited commercial power footprint in remote areas

- Mountainous terrain over significant portions of the district
- Limited economic incentives (capital and operating) for mobility service providers to extend service
- Service area split between Bell and Telus within the district

While none of the above is technically insurmountable, these factors, together with the general market factors discussed above, do increase the cost and complexity of improving the cellular coverage footprint in the district.

5.3.4 Emerging Role of LEO Satellites

The use of Low Earth Orbit (LEO) Satellite networks have been playing an increasing role in remote cellular communications. Recent technology and service changes is seeing the role expanding to commercial cellular subscribers.

Since the late 1990's, remote, mobile communication has been possible using LEO satellite systems such as Iridium. These networks, however required specialized subscriber equipment and the airtime charges were considerably more expensive than terrestrial cellular services. Due to their cost usage has been typically limited to government and corporate entities.

The late 2010's saw the introduction of personal satellite communicators such as SPOT, InReach and Zoleo. While these units utilize specialized hardware (either a standalone device or a satellite modem to pair with a smartphone), the relatively low airtime price put the unit within the reach of many consumers and outdoor enthusiasts. This service is limited to data transmission comprising GPS coordinate information and short messages that can be pre-established, composed on the device or on a linked cell phone.

Recently, the use of LEO satellite services has been possible using commercially available cellular equipment. This started in the early 2020's with Apple's introduction of emergency SOS text services via Globalstar LEO satellite network on the iPhone 14, and iPhone 15 models with an installed SIM card and iOS 16.1 or later in Canada. Apple's SOS service is limited to text communications when operating outside of terrestrial cellular or WiFi service and is primarily intended for communication with emergency services such as 911 Public Service Answer Points (PSAP's). Apple IOS 18 now supports texting via satellite, Roadside Assistance and Find My via satellite.

Full details of these services were updated by Apple on July 29th, 2024, and can be found at the links below.

Use Emergency SOS via satellite on your iPhone - Apple Support (CA)

Send a text message via satellite on iPhone - Apple Support (CA)

The support of LEO satellite services on Android devices is expected to follow suit in the near future. Satellite connectivity capability has been available on Android release 15, however manufacturers have been slow to implement the necessary hardware changes to support direct to satellite communications.

A number of cellular carriers are also working on supporting LEO satellite communications without the need for specialized cellular hardware. In Canada, Rogers has signed agreements with Lynk Global and Starlink for LEO support for emergency messaging, data and voice services. While trial calls have been made using the Lynk platform, the general availability date for this service has not been formalized.

While the use satellite LEO services may ultimately address the remote communication needs of cellular subscribers, its utility is currently limited due to:

- Availability of the emergency SOS service linking users to 911 PSAP's is currently limited to iPhone 14 and newer owners
- Timeframes for general availability to a wider device and thus user population base is unknown
- The user's experience for satellite service usage is very different from traditional cellular communications
- Usage requires a clear view of the sky (i.e. may not work inside vehicles, under tree canopy, etc.)
- The availability of a satellite link may be limited, or delayed, in mountainous regions
- Future costs for the satellite service are unknown

Based on the above, it is unclear whether LEO services will be a suitable alternative to providing cellular communication service to unserved rural and remote areas. However, due to the publicity LEO services are receiving, the mere prospect of this service being available in the future has caused cellular carriers to rethink any plans that they had for cellular service to remote and rural areas.

5.3.5 Role of microcells for In-community coverage

A microcell is a cell in a mobile phone network served by a low power cellular base station, with limited capacity and power level. The are usually used to cover a limited area such as a small strip mall, a motel, a park, a transportation hub or perhaps a small group of houses. Micro cells are usually installed in areas with deployed FTTP. They are reliant on fibre backhaul to connect them to the provider's network. They are also dependant on secondary AC power being available on the pole or structure they are installed on. Even smaller coverage and capacity cellular sites are sometimes referred to as "picocells". A microcell is usually larger than a picocell, though the distinction is not always clear, and the actual hardware might be very similar in physical size and appearance.

An example microcell array is show in the diagram below, in this case the array is quite close to other cellular sites, but due to topology, tree height and foliage density the area cannot be served by the nearby cellular sites on the left.

5.3.6 Cost Metrics

The capital cost associated with the installation of a new cellular site varies considerable depending on a number of factors, including:

- Site Region (e.g. availability of local worker, resource costs in region, transportation cost, etc.)
- Site access requirements (e.g. existing roadways, new road build, helicopter access only, etc.)
- Availability of commercial power
- Tower height required
- Ground/soil conditions (Preparation and stabilization of site)
- Land acquisition cost
- Commodity Pricing (e.g., steel and concrete costs, etc.)

The capital costs for a stand-alone cellular site can typically vary between $1M and $2.5M depending on the above factors. Outliers are possible with the potential for sites to be either higher or lower than the above range. The higher budget range will be typically encountered in sites without nearby commercial power and/or road access.

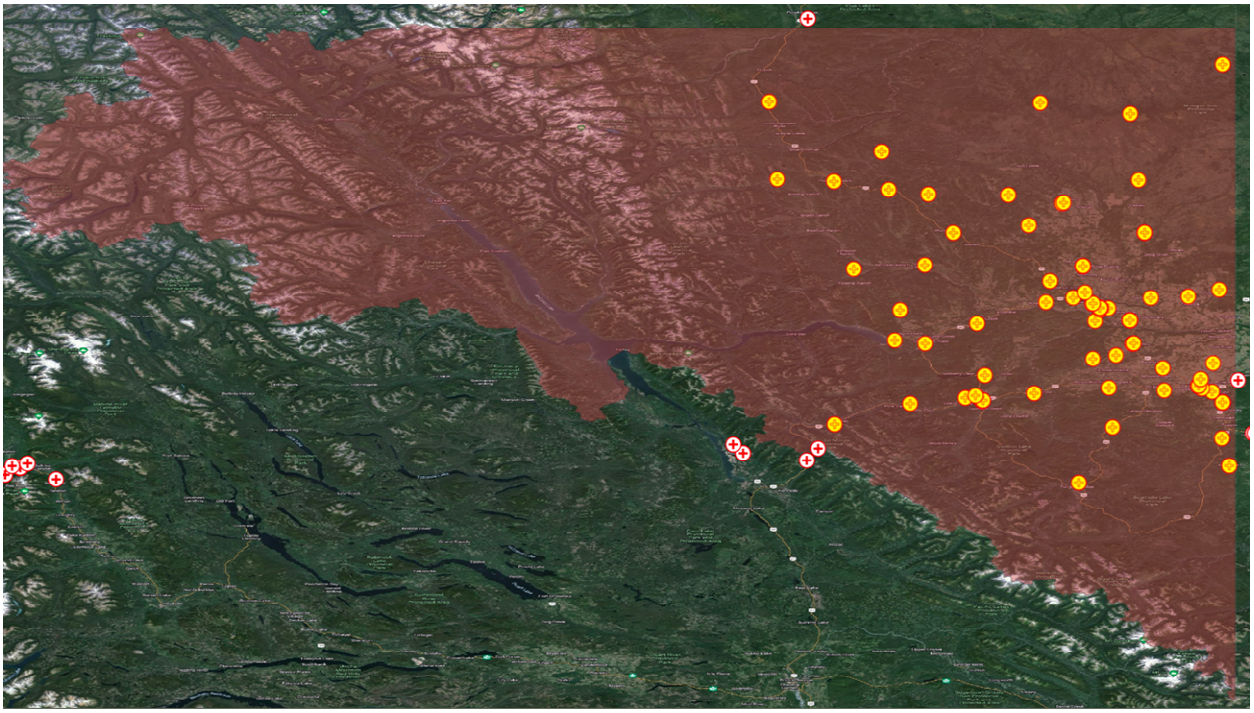
The operating costs of a cellular sites also vary by location. Factors that impact operating cost are:

- Land lease costs
- Site power requirements (generator maintenance and fuel costs for sites without commercial power)
- Site maintenance costs (snow clearing, security, etc.)
- Cellular technician travel and access costs

Annual operating costs for a cellular site can typically vary between $75k and $250k. As with capital costs, outliers are possible depending on site factors. The higher operating cost ranges are typically encountered on sites without commercial power availability.

5.4 CELLULAR CONNECTIVITY

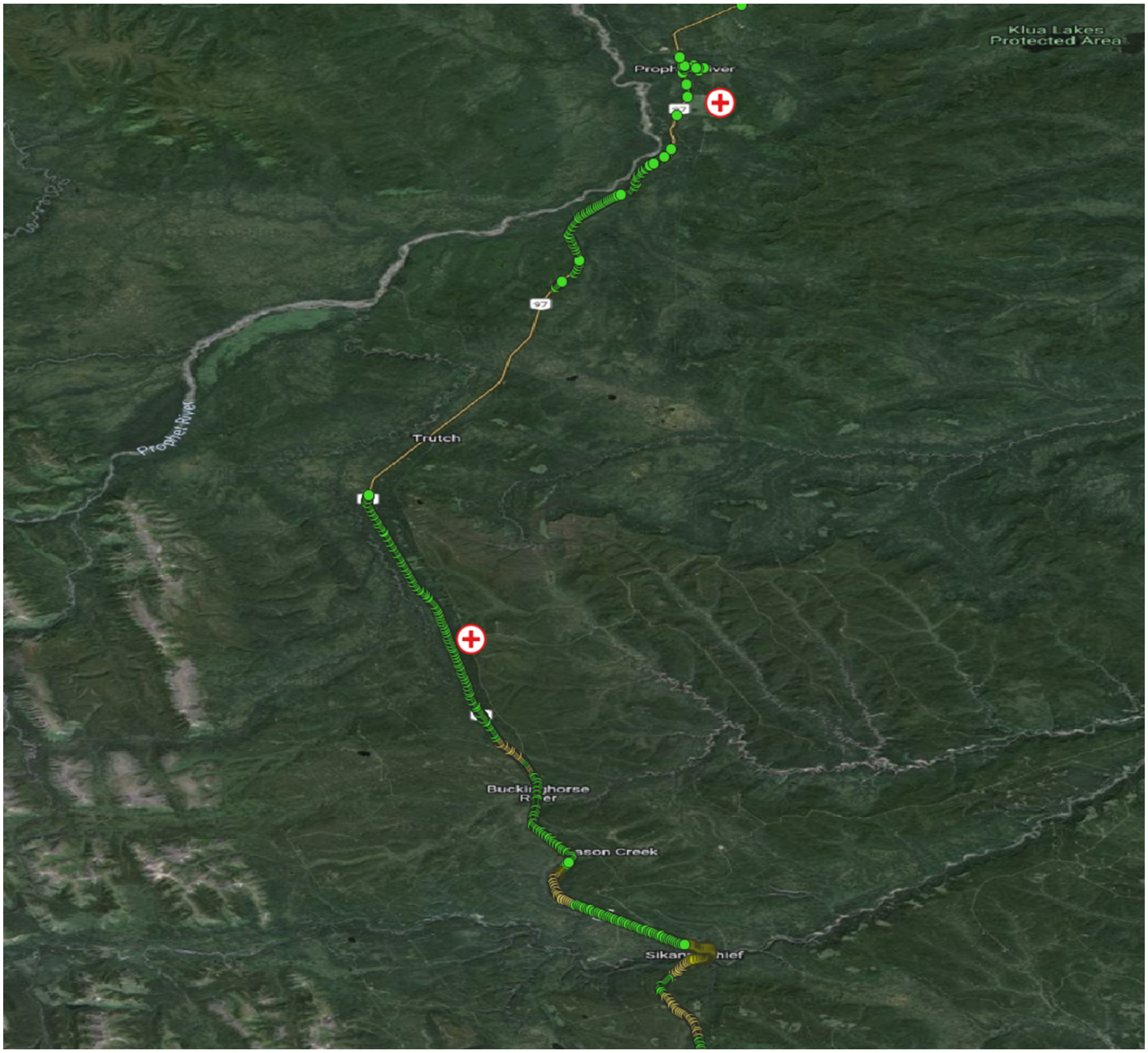
The following figure shows the existing 70 cell site locations (yellow site marker) inside the PRRD.

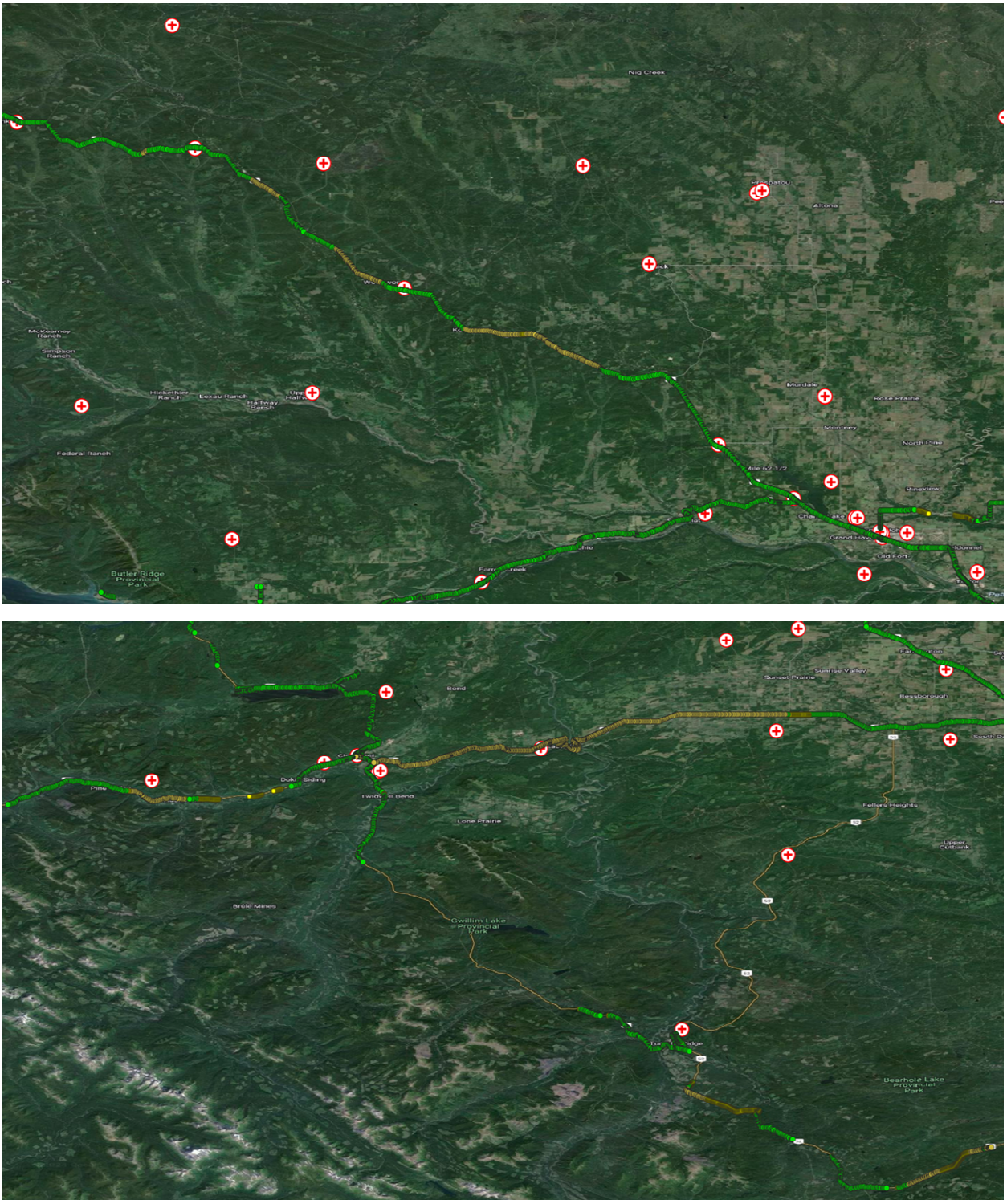


5.4.1 Regional Drive Testing

Cellular drive testing was previously conducted within, and north of, the PRRD in 2022. The following figures illustrate areas along the routes of interest which contain significant gaps in coverage. These gaps are indicated by the absence of successful test points (green or amber dots). The green dots indicate areas in which the test unit was operating on 5G or LTE services. Amber dots indicate areas in which the test unit radio was operating on older generation cellular services (GSM, UMTS, HSPA, etc.).

It should be noted that drive testing only included Telus and Bell sites and did not consider Rogers' coverage. This was a function of the drive test configuration.


Klua Lakes
Protected Area
Trutch
Prophet River
97



Note that coverage is expected on Highway 52 and the lack of test points is not indicative of service level.

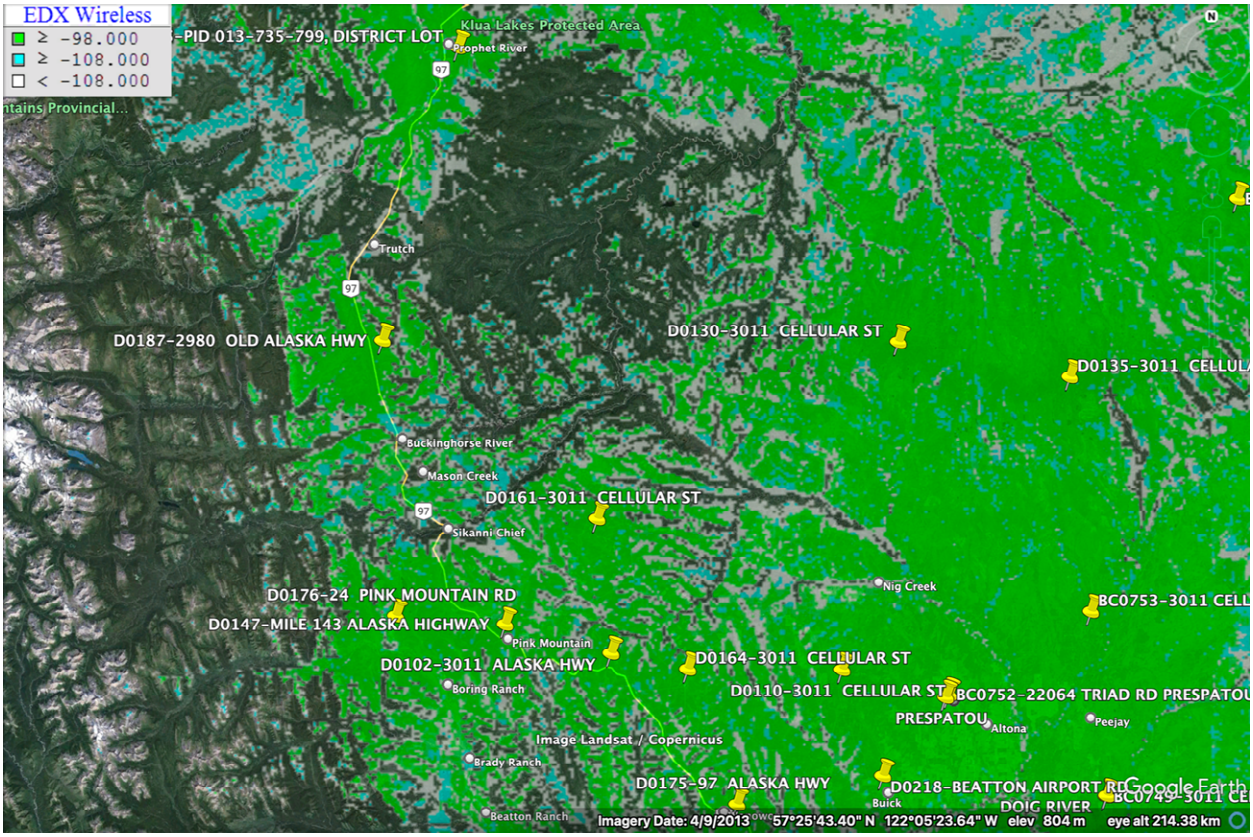
In general, the drive test results align with Planetworks' RF prediction and carrier coverage maps

5.4.2 Updated Drive Testing

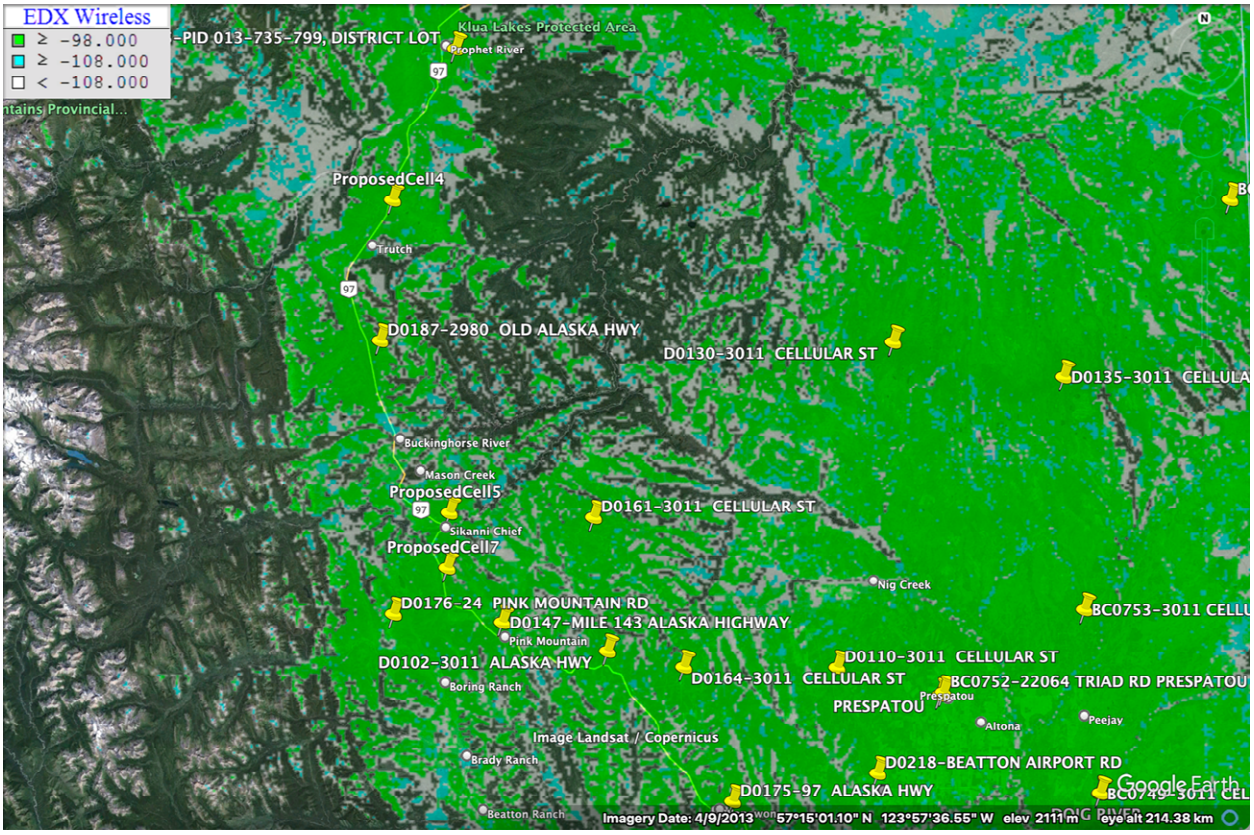
Localized, cellular drive testing is currently being conducted as part of the PRRD fire radio upgrade project. At the time of report generation this data is not fully available and is therefore not included in this report (2024).

5.4.3 Highway 97 Coverage

The following shows existing cellular coverage on the northern section of Highway 97



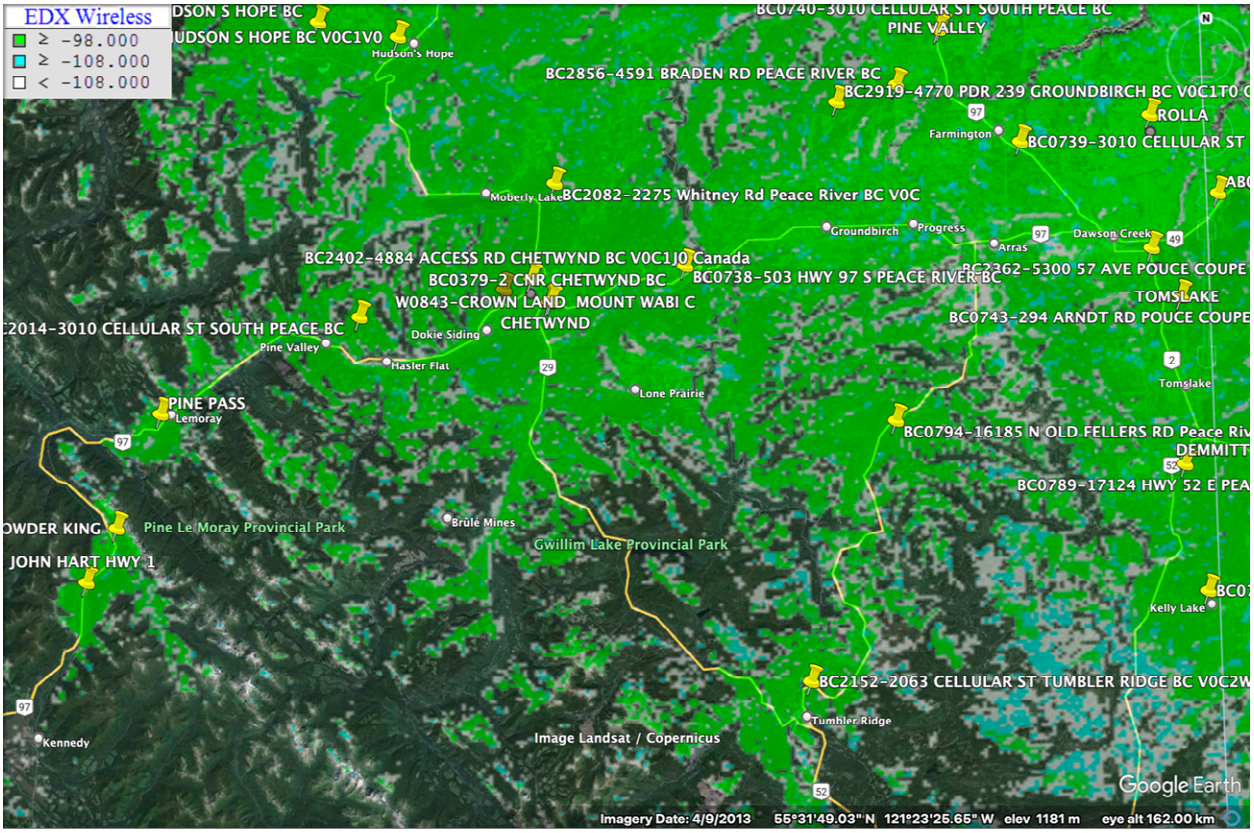
The following shows predicted coverage with three new sites located in vicinity of Trutch and Sikanni Chief. Note that additional sites would be required to close small gaps near Buckinghorse River and Mason Creek.



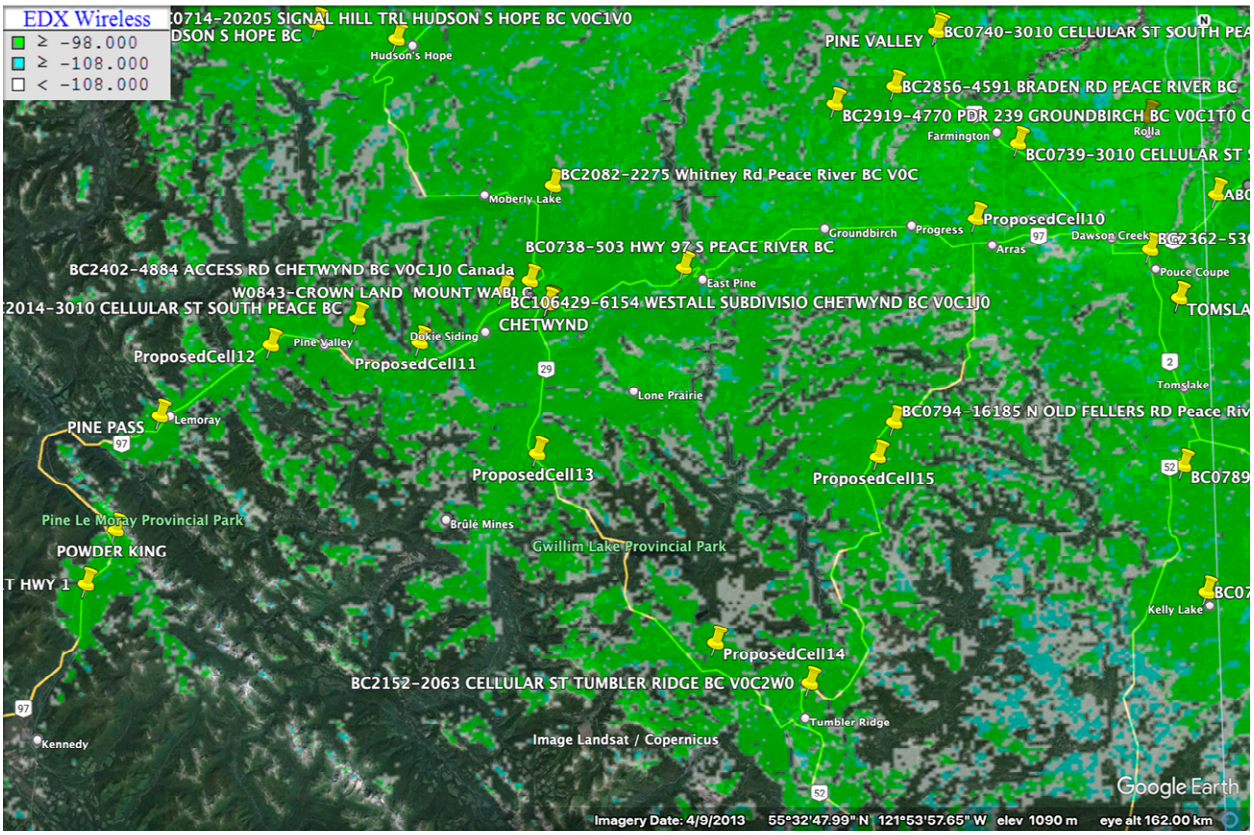
- Coverage maps
- Estimated Cell sites to fill in holes, coverage maps, capex and Opex

5.4.4 Highway 97 (West), 29 and 52 Coverage

The following shows predicted cellular coverage in the Highway 97 (west), Highway 29 and Highway 52 areas.



The following illustrates potential coverage with 6 new proposed cell sites to provide in-fill coverage. It should be noted that gaps still exist along Highway 29, 52 and 97 (west of Lemoray)



In all cases it should be noted that potential coverage could be optimized further though more optimal site selection or through additional sites.

Additionally, Rogers is in the process of building out 7 cellular sites west of Chetwynd along highway 97 which could negate the need for additional cell sites in this region.

5.5 HIGHWAY COVERAGE ESTIMATES

The following table shows potential capital and operating costs associated with the build (CAPEX) and annual operation (OPEX) for the above 9 potential cellular sites.

#	Highway Segment	Area	Budgetary CAPEX	Budgetary OPEX (annual)
1	97 (North)	Trutch	$2.5M	$250k
2	97 (North)	Sikanni Chief	$1.5M	$75k
3	97 (North)	South of Sikanni Chief	$2.5M	$250k
4	97 (West) & 52	Arras	$1.5M	$75k
5	97 (West)	Hassler Flat	$2.5M	$250k
6	97 (West)	East of Lemoray	$2.5M	$250k
7	29	North of Gwillim Lake	$2.5M	$250k
8	29	South of Gwillim Lake	$2.5M	$250k
9	52	South of Fellers Heights	$2.5M	$250k
Budgetary Totals			**$20.5M**	**$1.9M**

Opex costs range from $75K per year to $250K. The reason for the difference is power and road access. The low end represents pricing received from service providers for other projects where road access and BC Hydro power is readily available and the high end for projects where the service provider must generate their own power and where the site has no road access.

5.6 RECOMENDATIONS AND NEXT STEPS FOR ENHANCED CELLULAR CONNECTIVITY

Planetworks recommends that the PRRD remain informed about ongoing consultations from the CRTC and ISED, particularly those affecting the deployment of cellular sites along highways, and be ready to comment on relevant issues. Additionally, PRRD should monitor developments in cell phone connectivity to low Earth orbit (LEO) satellites and track the progress of Rogers' 2021 announcement regarding enhanced cellular service from Pine Pass to Chetwynd along Highway 97, providing updates on the status.

The following is a list of recommendations resulting from the analysis.

5.6.1 Advocacy: Work with both Provincial and Federal Government departments (CRTC, ISED in particular) to develop funding incentives – including both capex and opex subsidies for Mobility service providers to extend highway service

5.6.2 Advocacy: Work with Federal Government departments to develop roaming policies for mobility providers in the north

5.6.3 Work with Service Providers to discuss best approaches to In-Community coverage – microcells, towers, new technology

5.6.4 Conduct regional drive tests as new infrastructure built out; and that this data be used and analyzed

5.6.5 Investment: Consider investing in infrastructure such as extending power and developing road access, which will help reduce the operational cost of new cell sites. This may include developing towers for shared use but due to the liabilities of owning and maintaining towers, and that there are upfront subsidies available today that would cover the tower cost for the service, might be less effective than extending power and roads.

6.0 APPENDICES

COMMUNITY LIST

name	latitude	longitude	Electoral Area
Blueberry River First Nations	56.7040408	-121.1124132	Blueberry River First Nations
Beryl Prairie	56.08438	-122.043591	District of Hudson's Hope
Hudson's Hope	56.031944	-121.906943	District of Hudson's Hope
Lynx Creek	56.068333	-121.836667	District of Hudson's Hope
Taylor	56.154368	-120.679864	District of Taylor
Doig River First Nation	56.57785363	-120.4955851	Doig River First Nation
Altona	56.877525	-120.953724	Electoral B
Attachie	56.220478	-121.423331	Electoral B
Bear Flat	56.274046	-121.230744	Electoral B
Beatton Ranch	56.733301	-122.5833	Electoral B
Boring Ranch	56.95	-122.700002	Electoral B
Brady Ranch	56.833299	-122.6333	Electoral B
Buckinghorse River	57.390144	-122.84167	Electoral B
Buick	56.762466	-121.270044	Electoral B
Cecil Lake	56.305961	-120.576751	Electoral B

Clayhurst	56.186796	-120.030465	Electoral B
Farrell Creek	56.122756	-121.737926	Electoral B
Federal Ranch	56.4	-122.383299	Electoral B
Flatrock	56.26657	-120.284747	Electoral B
Goodlow	56.333645	-120.136478	Electoral B
Halfway Ranch	56.499887	-122.034821	Electoral B
Kobes	56.638899	-121.650001	Electoral B
McKearney Ranch	56.6333	-122.466699	Electoral B
Mile 62 1/2	56.408379	-121.157301	Electoral B
Montney	56.450304	-120.926493	Electoral B
Murdale	56.533233	-121.001451	Electoral B
North Pine	56.433235	-120.718103	Electoral B
Osborn	56.604199	-120.377801	Electoral B
Peejay	56.883299	-120.6167	Electoral B
Pink Mountain	57.035654	-122.507348	Electoral B
Prespatou	56.922264	-121.062581	Electoral B

Rose Prairie	56.50867	-120.783026	Electoral B
Sikanni Chief	57.234626	-122.694743	Electoral B
Simpson Ranch	56.6	-122.433301	Electoral B
Trutch	57.731386	-122.961712	Electoral B
Upper Halfway	56.517639	-122.225726	Electoral B
Wonowon	56.728834	-121.814153	Electoral B
Baldonnel	56.199898	-120.68476	Electoral C
Charlie Lake	56.297401	-120.985399	Electoral C
Charlie Lake part B	56.336792	-121.009291	Electoral C
Clairmont	56.255928	-120.899884	Electoral C
Grand Haven	56.240206	-120.898661	Electoral C
Old Fort	56.202176	-120.82327	Electoral C
Two Rivers	56.183233	-120.534753	Electoral C
Arras	55.753519	-120.525783	Electoral D

Bessborough	55.810857	-120.506356	Electoral D
Briar Ridge	55.781334	-120.042987	Electoral D
Doe River	55.999901	-120.08473	Electoral D
Farmington	55.900001	-120.499999	Electoral D
Fellers Heights	55.598611	-120.566667	Electoral D
Gundy	55.599896	-120.001379	Electoral D
Kelly Lake	55.260183	-120.042959	Electoral D
Kilkerran	55.839514	-120.271564	Electoral D
Parkland	55.916561	-120.568078	Electoral D
Rolla	55.89861	-120.142591	Electoral D
Seven Mile Corner	55.897555	-120.32426	Electoral D
Shearer Dale	56.066569	-120.084732	Electoral D
South Dawson	55.733227	-120.351397	Electoral D

South Taylor	56.106812	-120.633736	Electoral D
Tomslake	55.555385	-120.077592	Electoral D
Tower Lake	56.015487	-120.561331	Electoral D
Tupper	55.512349	-120.039441	Electoral D
Upper Cutbank	55.519842	-120.439897	Electoral D
Valley View	55.984845	-120.245578	Electoral D
Dokie Siding	55.662477	-121.734267	Electoral E
East Pine	55.716699	-121.216701	Electoral E
Groundbirch	55.779964	-120.923326	Electoral E
Hasler Flat	55.611099	-121.966949	Electoral E
Lemoray	55.5389	-122.4833	Electoral E
Lone Prairie	55.566546	-121.384762	Electoral E

Moberly Lake	55.833345	-121.758464	Electoral E
Pine Valley	55.636062	-122.114868	Electoral E
Progress	55.781707	-120.716192	Electoral E
Sunrise Valley	55.866559	-120.66808	Electoral E
Sunset Prairie	55.839743	-120.763988	Electoral E
Twidwell Bend	55.615495	-121.571497	Electoral E
Wabi Hill	55.67069	-121.532394	Electoral E
Willow Valley	55.856302	-120.871525	Electoral E
Halfway River First Nation	56.513367	-121.964969	Halfway River First Nation
Fort Ware (Kwadacha)	57.42367325	-125.6302822	Kwadacha Nation
Saulteau First Nations	55.8522192	-121.6530037	Saulteau First Nations
Tsay Keh Dene	56.89186754	-124.9631517	Tsay Keh Dene Nation
Pouce Coupe	55.714722	-120.133611	Village of Pouce Coupe
West Moberly First Nations	55.83063379	-121.8309238	West Moberly First Nations

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   Send a text message via satellite on iPhone - Apple Support (CA)

2. BC Ministry of Citizens' Services Northern B.C. Connectivity Benefits Study:
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   https://irpp.org/research-studies/conquering-the-next-frontier-in-bridging-the-digital-divide/

3. BC Government Connectivity Objective. https://news.gov.bc.ca/releases/2024CITZ0008-000613#:~:text=The%20report%20shows%20B.C.%20is,Canada%20for%205G%20cellular%20services.

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5. CRTC Universal Broadband Objective Dashboard: https://crtc.gc.ca/eng/internet/internet.htm

6. CRTC Telecom Notice 2023-89 Call for Comments Broadband Fund Policy Review:
   https://crtc.gc.ca/eng/archive/2023/2023-89.htm

7. PRRD Connectivity Strategy public facing webpage dedicated to connectivity for constituents to learn connectivity activities and status being undertaken by PRRD.
   https://haveyoursay.prrd.bc.ca/rcs

8. PRRD Connectivity Strategy public facing web page with a link to the Canadian Internet Registration Authority (CIRA) speed test.

9. Rogers Cellular service available at the West Pine rest area and Powder King Mountain Resort. See announcements at: https://about.rogers.com/news-ideas/rogers-brings-critical-connectivity-along-highways-95-and-97-in-british-columbia/ and
   https://news.gov.bc.ca/releases/2021CITZ0031-000814.

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13. Valo Networks, **Peace River Regional District Connectivity Strategy Report,** November 2021 Valo Networks Ltd. (ehq-production-canada.s3.ca-central-1.amazonaws.com)

CONNECTIVITY DASHBOARDS

BLUEBERRY RIVER FIRST NATIONS

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	1
Communities with "pending" FTTP funding applications (2024 activity)**:	N/A
Communities "unaddressed" for FTTP at June 2024:	N/A
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being within the boundaries of the community. This is an approximation.

Community List:

Blueberry River First Nations.

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A. Blueberry River First Nations is expecting FTTP to be installed by TELUS during August 2024.

Stakeholder feedback:

Verbal by interview

Key stakeholder comments:

Blueberry River First Nations has no cellular service in-community or along their access road. Cellular service is considered essential to personal safety and the Nation has recently initiated activities to look at

the capital costs to establish cell sites within the Nation. They are actively engaging Mobility Service providers.

Observations: *Blueberry River First Nations lies on the boundary between the Radio Access Network for Bell Mobility and TELUS Mobility. Both service providers could build tower infrastructure on the Nation but only one will be elected to do so. To determine which mobility service provider is appropriate, Bell or TELUS, Blueberry River First Nations will have to initiate meetings with both and facilitate a decision among the two as to who should be the lead for the tower infrastructure discussions.*

Recommendations and Next Steps:

1. *Given that TELUS is building out FTTP during summer 2024 and given the network synergies between FTTP and microcell technology for cellular service, we recommend that Blueberry River First Nations approach TELUS regarding microcell technology as an alternative, less expensive option to building tower infrastructures for in-community coverage.*
2. *We also recommend that Blueberry River First Nations continue in parallel with the above recommendation with their current plans to investigate costs to build tower infrastructures. This information is critical as it is expected that the Mobility service provider will ask for upfront capital or on-going operational expenses or both, to subsidize the infrastructure buildout.*

CITY OF FORT ST JOHN

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	1
Communities with funded FTTP projects*:	N/A
Communities with "pending" FTTP funding applications (2024 activity)**:	N/A
Communities "unaddressed" for FTTP at June 2024:	N/A
Communities "estimated" to have in-community cellular service***:	1

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Fort St John.

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A. Fort St John is fully serviced.

Stakeholder Engagement:

Stakeholder deferred their interview to others requiring more time on connectivity given that Fort St John is a fully connected and served by multiple competitive broadband service providers and multiple cellular operators.

Key stakeholder comments:

N/A.

Observations:

N/A.

Recommendations and Next Steps:

None at this time.

CITY OF DAWSON CREEK

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	1
Communities with funded FTTP projects*:	N/A
Communities with "pending" FTTP funding applications (2024 activity)**:	N/A
Communities "unaddressed" for FTTP at June 2024:	N/A
Communities "estimated" to have in-community cellular service***:	1

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Dawson Creek

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A Dawson Creek is fully serviced.

Stakeholder Engagement:

By email reply to questionnaire received by PRRD August 8, 2024

Key stakeholder comments:

Tele-health is becoming increasingly popular since Covid. It has always been difficult to find a Doctor and get an appointment, this is much harder since Covid. Many residents are finding tele-health to be a faster better option than seeing a local Doctor.

Known poor highway Coverage Locations: Highway 97S by Braden Rd, Groundbirch, East Pine, the pine pass from Chetwynd to Prince George, Highway 97N by the Kiskatinaw Bridge, Highway 29 between Hudson Hope and Fort St John, Highway 29 between Chetwynd and Tumbler Ridge, and on Road 3 between Rolla and Clayhurst

Observations:

None at this time

Recommendations and Next Steps:
None at this time

DOIG RIVER FIRST NATION

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	1
Communities with "pending" FTTP funding applications (2024 activity)**:	N/A
Communities "unaddressed" for FTTP at June 2024:	N/A
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being captured within the boundaries of the community. This is an approximation.

Community List:

Doig River First Nation

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A Doig River First Nation (DRFN) is expecting FTTP to be installed late summer 2024.

Stakeholder feedback:

Verbal by interview

Key stakeholder comments:

Doig River First Nation is concerned about lack of cellular coverage in-community and along the emergency access roads. Cellular service is considered essential to personal safety and the Nation has

initiated activities over a year ago to look at the capital and operating costs to establish cell sites within the Nation. DRFN have had discussions with mobility service providers since then; however, is focussing on the FTTP deployment for this year. Once FTTP is in place, DRFN will focus on cellular coverage and various business models including deployment of microcells, necessary to incent the service provider to provide service.

Recommendations and Next Steps:

We have no additional recommendations or next steps to offer DRFN currently.

DISTRICT OF CHETWYND

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	1 (partial)
Communities with funded FTTP projects*:	N/A
Communities with "pending" FTTP funding applications (2024 activity)**:	1(remainder)
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	1

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

District of Chetwynd

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A.

Stakeholder Engagement:

Verbal by Interview and followed by email

Key stakeholder comments:

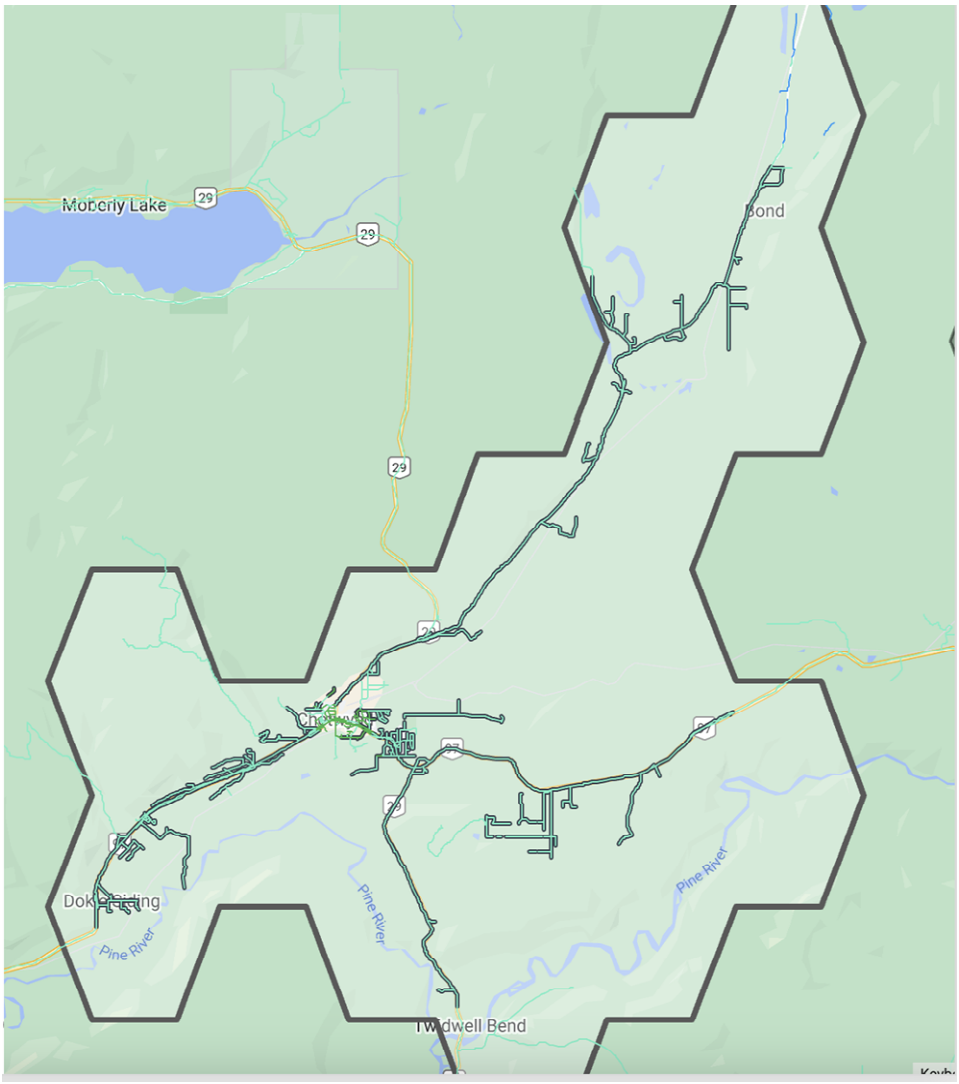
Telemedicine is a significant policy issue for the District given the chronic shortage of healthcare professionals such as doctors and nurses.

In addition to personnel shortages, the District is concerned about cellular coverage for their emergency responders. Coverage drops within 5km of the edge of town.

Other issues include frustration over the starting and stopping of the FTTP builds in Chetwynd. FTTP was deployed in certain areas several years ago and then all activity ceased.

Observations:

The District of Chetwynd is subject to a partial FTTP build. The National Broadband Internet Service Availability Map (November 2023) indicates most of the District being FTTP but certain roads and areas at the edges of the District not addressed. Chetwynd and the surrounding areas are the subject of a funded project recorded in the 2023 database and it is expected that FTTP the premise will be extended significantly. The map below as lifted from the ***National Broadband Internet Service Availability Map*** *indicates the expected FTTP footprint.*



Rogers is currently building cellular coverage along Highway 97 from Chetwynd to Pine Pass. This cellular build has been delayed due to the fibre transport project, also delayed. The transport build is expected to be completed yearend 2024 with the cellular service to follow. It is important to track the development of this corridor and see if it addresses the coverage concerns.

Recommendations and Next Steps:

1. *Given the FTTP application activity in the Area, we recommend a "wait and see" approach to determine which areas inside and outside Chetwynd are still left unaddressed for FTTP once the funding has been settled. This should be known by yearend 2024.*
2. *Once funding is awarded and the service provider is committed to proceed, we recommend that Chetwynd engage the service provider, track the service providers' FTTP deployment progress and work with the service provider to clear any roadblocks for which they have influence such as permitting.*
3. *Given the Rogers' cellular activity in the Area, we recommend engaging Rogers to track the development of their transport system along Highway 97 and following that, the development of the cell sites necessary to illuminate the Highway.*
4. *Once Rogers completes their cellular expansion, it would be good for the PRRD to conduct a "mini-drive" test of the area to measure the increased coverage.*

DISTRICT OF HUDSON'S HOPE

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	1
Communities with funded FTTP projects*:	N/A
Communities with "pending" FTTP funding applications (2024 activity)**:	N/A
Communities "unaddressed" for FTTP at June 2024:	N/A
Communities "estimated" to have in-community cellular service***:	1

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

District of Hudson's Hope

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A. The District is fully serviced with FTTP and cellular.

Stakeholder engagement:

Verbal by Interview

Key stakeholder comments:

While the core of Hudson's Hope is addressed by FTTP, the periphery of the community where the population is rural, is not served by FTTP. People in these areas have options of fixed wireless access

from PRiS and TELUS Hub which are 25/5 or Starlink. There have been no conversations with TELUS regarding the expansion of their FTTP outward to the more rural homes in Hudson's Hope.

In-community cellular is good except for an area under the tower shadowed by terrain. This is a TELUS tower.

Many people living in Hudson's Hope work for BC Hydro roughly 24km away at the GMC dam site. Between the cell site in Hudson's Hope and a cell site above the BC Hydro dam site, the cellular coverage along the road is good for the commuters.

Cellular coverage along Highway 29, one of the major highways leaving Hudson's Hope is very poor. Cell service stops on Highway 29 roughly 12km out of town and resumes again at West Moberly

Observations:

Based on stakeholder discussions, Hudson's Hope is adequately represented in the data set for the National Broadband Internet Service Availability Map.

At least one service provider has applied to serve the periphery of Hudson's Hope with FTTP.

Recommendations and Next Steps:

5. *Given the FTTP application activity in the Area, we recommend a "wait and see" approach to determine which areas outside Hudson's Hope are left to be addressed for FTTP once the funding has been settled.*
6. *Once funding is awarded and the service provider is committed to proceed, we recommend that Hudson's Hope engage the service provider, track the service providers' FTTP deployment progress and work with the service providers to clear any roadblocks for which they have influence such as permitting.*

ELECTORAL AREA B

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	31
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	26
Communities "unaddressed" for FTTP at June 2024:	5
Communities "estimated" to have in-community cellular service***:	9

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being within the community boundaries. This is an approximation.

Community list:

Altona, Attachie, Bear Flat, Beatton Ranch, Boring Ranch, Brady Ranch, Buckinghorse River, Buick, Cecil Lake, Clayhurst, Farrell Creek, Federal Ranch, Flatrock, Goodlow, Halfway Ranch, Kobes, McKearney Ranch, Mile 62 1/2, Montney, Murdale, North Pine, Osborn, Peejay, Pink Mountain, Prespatou, Rose Prairie, Sikanni Chief, Simpson Ranch, Trutch, Upper Halfway, Wonowon

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

Halfway Ranch, Beatton Ranch, Boring Ranch, Brady Ranch, Simpson Ranch

Stakeholder feedback:

Verbal by interview

Key stakeholder comments:

Connectivity remains a challenge for Electoral Area B. Given the remote location, there is concern that although almost all communities are part of at least one service provider's application for FTTP funding, there is concern that not all will be built once the funding is awarded and the service providers' readdress the viability of their business cases with the awarded funded. There is a concern that certain communities will be left and those left, will be exceedingly difficult economically for service providers.

Cellular coverage along 97 is spotty and remains a safety concern.

Observations:

*The **National Broadband Internet Service Availability Map** data defines 13 communities in Electoral B as being funded for FTTP (Nov 2023) which after discussions with the service providers are neither funded for FTTP nor part of any plans by these service providers for FTTP. This data is in error and could affect future FTTP funding applications for Altona, Attachie, Bear Flat, Buick, Cecil Lake, Goodlow, Kobes, Montney, North Pine, Pink Mountain, Prespatou, Rose Prairie, Wonowon. The data errors have been forwarded to CCBC and to ISED.*

*In the meantime, between CCBC funding announcements in January 2024, and our understanding of service provider applications for FTTP funding to CCBC in March 2024 and June 2024, all 13 communities that were listed in error as being funded for FTTP in the November 2023 database update are being addressed in FTTP funding applications by at least one service provider in 2024. Furthermore, we believe that another 13 of 31 communities recorded in the **National Broadband Internet Service Availability Map** have been either funded for FTTP in 2024 or are part of a funding application before CCBC in March and June 2024, bringing a total of 26 of 31 communities being part of one or more FTTP applications for funding by service providers and leaving just five communities unaddressed for FTTP plans. These communities are listed above. Each has less than 10 civic addresses each and can easily be addressed by LEO technology such as Starlink. According to **The National Broadband Internet Service Availability Map** data, these communities are already connected by a fibre transport line, making it potentially easier should a service provider develop a feasible business case to extend FTTP in the future.*

Recommendations and Next Steps:

7. *Given the significant activity in the Area, we recommend a "wait and see" approach to determine which communities are left to be addressed for FTTP once the funding has been settled. We recommend revisiting the FTTP funding status for each community in 2025.*
8. *Once a community is funded and the service provider is committed to proceed, we recommend that key representatives from Electoral B be tasked to track the service providers' FTTP deployment progress and work with the service providers to clear any roadblocks for which they have influence such as permitting.*
9. *Highway 97 is a critical highway corridor for the PRRD which runs through Electoral B with spotty cellular coverage north of Ft St John. Much of the highway north of Ft St John is currently served by the Bell Mobility RAN and does not have power, making the extension of cellular service costly from an on-going operational perspective due to need of generators and battery plants. We recommend Electoral B with the PRRD, initiating discussions with Bell Mobility to determine costs and interest in extending coverage.*

ELECTORAL AREA C

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	7
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	7
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	3

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being captured within the community boundaries. This is an approximation.

Community list:

Baldonnel, Charlie Lake, Charlie Lake part B, Clairmont, Grand Haven, Old Fort, Two Rivers

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

There are no unaddressed communities in Electoral Area C for FTTP. Service providers have applied for funding for all the communities

Stakeholder feedback:

Verbal by interview

Key stakeholder comments from Director Sperling:

We have fibre in Fort St John, but distribution is inequitable. For example; fibre installed on one side of some roads and not the other, fibre not run inside trailer parks (private property issue). Fibre not run in:

Old Hope Road area, Aspen Subdivision, Charlie Lake Community Hall and area. These areas have copper lines, but no fibre has been installed to date.

The local service provider has not provided maps to show their currently serviced areas even though PRRD offered to sign a non-disclosure agreement in order to obtain the information.

We have situations like our community club, which is only 200m from Fibre and is not connected even though PRRD offered to pay the total installation cost.

Observations:

*The **National Broadband Internet Service Availability Map** data defines all 7 communities in Electoral C as being funded for FTTP (Nov 2023) which after discussions with the service providers are neither funded for FTTP nor part of any plans by these service providers for FTTP. This data is error and could affect future FTTP funding applications for Baldonnel, Charlie Lake, Charlie Lake part B, Clairmont, Grand Haven, Old Fort, Two Rivers. The data errors have been forwarded to CCBC and to ISED to be cleared.*

In the meantime, from our understanding of service provider applications for FTTP funding to CCBC in March 2024 and June 2024, all 7 communities that were listed in error as being funding for FTTP in November 2023 are being addressed in FTTP funding applications by at least one service provider in 2024.

Recommendations and Next Steps:

1. *Given the significant activity in the Area, we recommend a "wait and see" approach to determine which communities are left to be addressed for FTTP and revisit. We recommend revisiting the FTTP funding status for each community in 2025.*
2. *Once a community is funded and the service provider is committed to proceed, we recommend that key representatives from Electoral C be tasked to track the service providers' FTTP deployment progress and work with the service providers to clear any roadblocks for which they have influence such as permitting.*

ELECTORAL AREA D

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	20
Communities with FTTP*:	1
Communities with funded FTTP projects*:	1
Communities with "pending" FTTP funding applications (2024 activity)**:	17
Communities "unaddressed" for FTTP at June 2024:	1
Communities "estimated" to have in-community cellular service***:	5

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Briar Ridge, Doe River, Farmington, Fellers Heights, Gundy, Kelly Lake, Kilkerran, Parkland, Rolla, Seven Mile Corner, Shearer Dale, South Dawson, South Taylor, Tomslake, Tower Lake, Tupper, Upper Cutbank, Valley View

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

Kelly Lake

Stakeholder feedback:

Verbal by interview

Key stakeholder comments:

The rural communities are not actually clusters of homes with defined community centers in this Area. It poses a problem with the ISED data as the PHH (hexagons) used to define areas is often too big or does not align with actual community boundaries. The connectivity status captured within the PHH areas determines whether the area is eligible for FTTP funding. Given the spread-out nature of the communities in this Area, there is a real possibility that the service providers will cherry-pick areas and not provide FTTP to the full area. The proof will be what the service providers actually deliver.

Concern regarding service provider secrecy was raised. The funding awards are competitive processes with sometimes multiple service providers vying for funding for the same communities. This is true in the PRRD where there has been a frenzy of service provider funding applications by multiple service providers for a few key communities. Consequently, service providers consider their applications for funding commercially confidential until the funding is awarded. The local governments need visibility as to which communities are being considered for FTTP funding applications and which are not, to effectively determine next steps.

After funds are awarded, information exchanges with local governments are required for accountability. Specifically, the providers should report on delivery of their roll-out (what, where and when). Regular project status reporting to the stakeholders (including PRRD) is recommended. As a minimum, annual reporting should be used to update the connectivity database. The need for accountability of public funding expenditures to the stakeholders was emphasized.

Observations:

It is unclear the exact status of FTTP deployments in Kilkerhan and Rolla. We were unable to meet with the service provider of record in the data in National Broadband Internet Service Availability Map for both communities to understand the true status. Kilkerhan is indicated as having FTTP in 2023. Kilkerhan and Rolla are also shown in the same 2023 dataset as being the subject of FTTP funding applications. Regardless of the confusion in the 2023 dataset, both communities are also part of FTTP funding applications by service providers in 2024 and if not already addressed, should be addressed in 2024.

Kelly Lake is the only community in this area where we were unable to verify FTTP funding plans or next steps. During the stakeholder interview, we had identified 3 communities that were not included in any FTTP plans or funding applications. We were then informed by a service provider that all three communities were addressed but when they shared their service area map, it was clear, Kelly Lake was not included in any FTTP service plans.

Kelly Lake has 36 civic addresses, making it a little large for continuous LEO service, but can be served by LEO service providers until FTTP is established. It is interesting to note that while we were unable to identify any FTTP plans for Kelly Lake, Kelly Lake is one of five communities in Electoral D with in-community cellular service, making it an excellent candidate for interim fixed wireless access services and 5G cellular.

Five communities have cellular towers within their boundaries are believed to have in-community cellular service. These include Briar Ridge, Kelly Lake, Rolla, South Dawson and Tupper.

Recommendations and Next Steps:

1. *Develop next steps for FTTP in Kelly Lake. This will involve meeting with both key members of Kelly Lake and service providers already active in the area with either funded FTTP deployments or pending FTTP funding applications. The PRRD IT team will access to specific data regarding which service providers are active in the area.*

2. *Given the significant activity in the Area, we recommend a "wait and see" approach for the remaining 19 communities, including Rolla and Kilkerhan recorded as being addressed in 2023, to determine which communities are left to be addressed for FTTP and revisit. We recommend revisiting the FTTP funding status for each community in 2025.*
3. *Once a community is funded and the service provider is committed to proceed, we recommend that key representatives from Electoral D be tasked to track the service providers' FTTP deployment progress and work with the service providers to clear any roadblocks for which they have influence such as permitting.*

ELECTORAL AREA E

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	14
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	14
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	4

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Dokie Siding, East Pine, Groundbirch, Hasler Flat, Lemoray, Lone Prairie, Moberly Lake, Pine Valley, Progress, Sunrise Valley, Sunset Prairie, Twidwell Bend, Wabi Hill, Willow Valley

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

All communities are addressed by FTTP funding applications in 2024

Stakeholder Engagement:

Verbal by Interview

Key stakeholder comments:

Significant concerns exist regarding the "cherry-picking" of areas by service providers and the secrecy of service providers plans. These concerns are compounded by the service providers' requests for letter of

support. The requested letters of support tend to on a very short turn-around timeframe and for projects which are nebulous and high-level. When the funds are awarded, information on the provider's roll-out plans are not available (which communities and when).

There is a need to press providers for more detail on plans (locations and time frames) upfront at the letter of support stage. (See observation note below regarding funding process) In the event of funds being awarded, regular meetings should be set up to get updates on progress, scope changes and any issues. Keeping up to date will get worse as the "connectivity landscape change accelerates" as the current funding programs kick-in.

Observations:

*The **National Broadband Internet Service Availability Map** data defines 3 communities in Electoral E as being funded for FTTP (Nov 2023) which after discussions with the service provider of record are neither funded for FTTP nor part of any plans by these service providers for FTTP. This data is error and could affect future FTTP funding applications for Groundbirch, Sunset Prairie and Willow Valley. The data errors have been forwarded to CCBC and to ISED to be cleared.*

In the meantime, from our understanding of service provider applications for FTTP funding to CCBC in March 2024 and June 2024, the 3 communities that were listed in error as being funding for FTTP in November 2023 are being addressed in FTTP funding applications by at least one service provider in 2024. Furthermore, the remaining 11 communities, bringing the total to 14 and all being addressed in Electoral Area E, are part of 2024 funding application activities.

Four communities of the 14, East Pine, Hasler Flat, Progress and Willow Valley have cell towers within the community boundaries and are therefore estimated to have in-community cellular service and be easily upgraded to 5G services if not 5G already.

During the stakeholder discussions, Jackfish Lake was identified as a community missing in the national database. We went back to the data and likely due to the placement of the PHH hexagons and the spread out, rural nature of the area, Jackfish as a community is missing. To correct for Jackfish Lake in the database, PRRD will have to register shape files defining Jackfish Lake with ISED.

The Letters of Support, the role that they play, the short turn-around times and service provider secrecy are all understandable issues and from our perspective, arise from the iterative funding process which is for a service provider to:

- *develop a business case,*
- *apply for funding, (and get letters of support)*
- *evaluate what funding is awarded against the funding application,*
- *redo the business case based on the awarded funding, and,*
- *amend the rollout plans to match the revised business case.*

Letters of Support are a relatively new requirement in the funding process and seem to have come into play for funding applications about 24 months ago. Prior to that, service providers, from our perspective, being federally regulated and applying for federal funding subsidies, could submit funding applications without informing and engaging the affected local community. From our perspective, the Letters of Support provide the much-needed local community visibility and engagement. It is also understandable the frustration with the lack of project information supplied by the Service Providers with their requests for Letters of Support. From our perspective, we understand the community frustrations not understanding detailed plans but also the service provider challenges in sharing information that likely will change during the funding process. There is no guarantee that service providers will receive funding as applied for and without funding there is no viable business case. Consequently, the secrecy arises as

service providers are reluctant to share their plans and set expectations which they cannot deliver. The funding process is competitive with only one service provider being awarded funding per community. After the funding has been awarded, each service provider must revisit their business cases and determine specifically which community can be addressed and which omitted. This activity is done with the funder and applies even to those service providers that have shared detailed rollout plans with the PRRD. The rollout will likely be different to the application especially in the situation within the PRRD in 2024 where multiple service providers are applying for funding for the same communities, and each are using these same communities as the economic anchor to finance their remaining plans.

While we understand (not condone) the service provider motivations for secrecy during the funding application process, we do not understand the secrecy once the funding is awarded and announced. We believe that the service providers should be providing regular status updates to the communities on the roll out. This rollout visibility for communities we believe is essential to ensuring whole areas are built out as awarded and the situation avoided where sub-areas are cherry-picked. We recommend that the PRRD explore with CCBC how funded service providers can be forced to share their roll out plans once funding awarded, and to provide regular status updates.

Recommendations and Next Steps:

1. *Given the significant activity in the Area, we recommend a "wait and see" approach for the 14 communities to determine which communities are left to be addressed for FTTP and revisit. We recommend revisiting the FTTP funding status for each community in 2025.*
2. *Once a community is funded and the service provider is committed to proceed, we recommend that key representatives from Electoral E be tasked to track the service providers' FTTP deployment progress and work with the service providers to clear any roadblocks for which they have influence such as permitting.*
3. *To incorporate Jackfish Lake into the national data, we recommend that PRRD GIS team define a shape file for Jackfish Lake and work with ISED update the community area. This can be done through the National Broadband site.*
4. *We recommend that Electoral Area E and the PRRD, meet with CCBC to review the purpose of the Letters of Support and what can be done to make service providers give communities regular updates on the rollouts once funded.*

HALFWAY RIVER FIRST NATION

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	1
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	1

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Halfway River First Nation

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

N/A.

Stakeholder Engagement:

Stakeholder engagement was not possible during the study interview period.

Key stakeholder comments:

Due to the study timing, we were unable to secure an interview time with the Nation. The information presented therefore, is based on publicly available information and conversations with service providers, has not been corroborated by the Nation and may not accurately reflect the Nation's views.

Observations:

Based on conversations with various service providers, we understand that one or more service providers have applied for funding for FTTP for Halfway River First Nation in 2024. We also understand that the Halfway River First Nation has a cell tower located within the Nation boundaries suggesting that the nation has cellular service which can be upgraded to 5G in future, if not 5G now. It is unclear without stakeholder discussions, the quality of the cellular service.

Recommendations and Next Steps:

1. *Given the service provider interest in deploying FTTP to the Nation, we recommend a "wait and see" approach to determine the outcome of the funding applications. We recommend revisiting the FTTP funding status in 2025 if a service provider has not come forward to announce to the Nation that they have been funded and are proceeding with deployment.*
2. *Once funded and a service provider committed to proceed, we recommend that the Nation track the FTTP deployment progress and work with the funded service provider to clear any roadblocks for which they have influence such as permitting.*

KWADACHA NATION

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	0
Communities "unaddressed" for FTTP at June 2024:	1
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Kwadacha Nation

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

Kwadacha Nation

Stakeholder Engagement:

Stakeholder discussions were not possible in the timeframe allocated.

Key stakeholder comments:

Stakeholder discussions were not possible in the timeframe allocated

Observations:

The incumbent service provider for basic telephone service is Northwestel. There is no fibre transport to this community and Northwestel provides basic telephone service via low-capacity satellite. Speed tests conducted on the PRRD CIRA page for Kwadacha Nation show subscribers achieving connectivity speeds of 100Mbps and greater, indicating in an environment with no broadband wireline systems, that some Nation members are subscribing to Starlink LEO services.

There are no cellular services in the Nation.

For the Nation to enjoy FTTP and 5G cellular services, they will need to secure a service provider to provide services. The service provider will need to apply to multiple funding streams – likely the CRTC Broadband Fund for fibre transport and CCBC for FTTP to secure the subsidies to upgrade the community satellite backbone to high-capacity LEO services until fibre transport facilities can be built out and then FTTP. Given the remoteness of the Nation, the transport will be costly and is estimated in 4.3.2. Under the current funding schemes, 90% of the upfront capital for the fibre transport and FTTP can be addressed by the subsidies, but the remaining 10% must be addressed by either the community or the service provider or a combination. Furthermore, it makes better financial sense if a single transport cable connecting the Nation with its neighbouring unserved Nation, Tsay Keh Dene Nation, makes the most sense.

Challenges arise extending cellular services to remote communities. Innovative business arrangements for upfront capital and on-going operational subsidies between the mobility service provider and the Nation outside the current funding streams will need to be negotiated and established before a mobility service provider will extend service. It is expected that specific funding streams to establish cellular connectivity in remote communities will become available in the future.

Recommendations and Next Steps:

1. *Given the complexity of the transport infrastructure to be designed and implemented before the access network can be built, detailed discussions with the Nation are required before next steps can be charted.*

MUNICIPALITY OF TAYLOR

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	1
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Municipality of Taylor

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

None

Stakeholder Engagement:

Verbal by Interview

Key stakeholder comments:

During the conversation, the following was confirmed:

- *The District is 50/10 with) Hybrid Fibre Coax (HFC) although performance during peak hours is less than 50/10*

- *The District has had conversations with service providers regarding FTTP. Existing service providers have no FTTP plans.*
- *There is at least one service provider which has applied for FTTP funding for Taylor although given that Taylor already is 50/10, it is likely that they will not be funded.*
- *Cellular service within Taylor is reasonable until the top of Taylor of Highway 97 where it diminishes.*

Observations:

We left this conversation with an action to follow-up with the Funders to determine when areas depicted as 50/10 using HFC technology will become eligible for FTTP funding. HFC is capable of much more capacity than 50/10 but can be subject to congestion, and lower data throughput during peak hours as experienced in Taylor, if not carefully monitored and managed by the service provider. The service provider must "node split" which involves technicians making physical adjustments in the HFC plant to alleviate internet data congestion. As a follow-up, during some informal conversations with the Funders, we learned that there are no current funding streams available to upgrade HFC to FTTP, especially for HFC plant like that in Taylor where the HFC plant is owned and maintained by a major HFC service provider. This might change in the future once the CCBC meets its goal for all BC inhabitants to have access to at least 50/10 by end of year 2027.

The District likely has cellular service. There are no cellular towers captured within the Municipal boundaries but there is one approximately 2km outside the boundaries which will partially illuminate parts of Taylor.

At least one service provider has applied for FTTP funding for the District, although given that the District is already 50/10, will likely not be funded. The District has had conversations with them.

Recommendations and Next Steps:

We have no recommendations at this time.

MUNICIPALITY OF TUMBLER RIDGE

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	0
Communities "unaddressed" for FTTP at June 2024:	1
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Municipality of Tumbler Ridge

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

Municipality of Tumbler Ridge

Stakeholder Engagement:

Verbal by Interview

Key stakeholder comments:

The biggest bone of contention is the map of speeds showing that Tumbler is 50/10. We have brought this issue with TELUS and the BC Ministry.

Limited cell phone coverage along the highway.

Observations:

*The Municipality is depicted as having 50/10 broadband coverage in the **National Broadband Internet Service Availability Map.** From 828 results runs on the PRRD CIRA page, while a few subscribers within Tumbler Ridge have 50/10, most do not. In fact, the average experience is 16.6Mbps down and 4.4 Mbps up.*

It is unclear in the data, which service provider is purporting 50/10 as none of the technologies listed in the data (fixed wireless access, satellite, DSL) are capable of blanketing Tumbler Ridge with 50/10 service. TELUS is the incumbent service provider for basic telephone and supplying DSL.

As Tumbler Ridge is shown in the data has having 50/10 service, it is not eligible for FTTP funding. The data must be updated to reflect the true situation where most of the community is sub 50/10. This will involve conversations with CCBC and with ISED. It will likely also involve independent testing by a third party to confirm that most of the community is sub 50/10. Once the data is corrected, service providers can apply for FTTP funding.

The Municipality has had multiple conversations regarding redundancy for the fibre transport route into the community. The Municipality has lost service for extended periods due damage caused to the fibre along the non-redundant route into the community. At present, there are no funding streams available for service providers to build redundant fibre routes. This funding situation may change in the future but given the safety risk associated with fibre cuts; the Municipality may need to consider some innovative business arrangement with the transport service provider to address this vulnerability now.

There is a cell tower located outside the Municipal boundaries. It provides spotty coverage to the municipality. There is no cellular coverage along the three highways leading into Tumbler Ridge, posing a safety risk to travellers.

Recommendations and Next Steps:

1. *Address the Municipality's ineligibility for FTTP funding due to its being designated as already 50/10. Meet with CCBC representatives to determine how best to update the database to reflect the true sub 50/10 performance. This may require support from PRRD and subsequent meetings with ISED and may require that the Municipality retain an independent third party to conduct speed tests.*
2. *Once the Municipality is reflected as sub 50/10 and eligible for FTTP funding, engage service providers to find a service provider willing to deploy FTTP.*

SAULTEAU FIRST NATIONS

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	*unconfirmed*
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	0
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	*unconfirmed*

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Saulteau First Nations

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

*Unconfirmed – We have learned second-hand that the Nation has FTTP. The data set for the **National Broadband Internet Service Availability Map** indicates no broadband services.*

Stakeholder Engagement:

Stakeholder discussions were not possible in the timeframe given

Key stakeholder comments:

Stakeholder discussions were not possible in the timeframe given

Observations:

*Saulteau First Nations is indicated as 5/1 in the data set for the **National Broadband Internet Service Availability Map.** We understand that this may be incorrect and that Saulteau may already be FTTP.*

Recommendations and Next Steps:

1. *Before next steps can be charted, we recommend a meeting with Saulteau First Nations to determine the accuracy of the national data and if FTTP is already in service.*

TSAY KEH DENE NATION

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	0
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Tsay Keh Dene Nation

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

Tsay Keh Dene Nation

Stakeholder Engagement:

Stakeholder interviews were not possible in the timeframe given.

Key stakeholder comments:

Stakeholder interviews were not possible in the timeframe given

Observations:

The incumbent service provider for basic telephone service is TELUS. There is no fibre transport to this community and TELUS provides basic telephone service via satellite. There are no cellular services in the Nation.

For the Nation to enjoy FTTP and 5G cellular services, they will need to secure a service provider to provide services. The service provider will need to apply to multiple funding streams – likely the CRTC Broadband Fund for fibre transport and CCBC for FTTP to secure the subsidies to upgrade the community satellite backbone to high-capacity LEO services until fibre transport facilities can be built out and then FTTP. Given the remoteness of the Nation, the transport will be costly and is estimated in section 4.3.2. Under the current funding schemes, 90% of the upfront capital for the fibre transport and FTTP can be addressed by the subsidies, but the remaining 10% must be addressed by either the community or the service provider or a combination. Furthermore, it makes better financial sense if a single transport cable connecting the Nation with its neighbouring unserved Nation, Kwadacha Nation, makes the most sense.

Challenges arise extending cellular services to remote communities. Innovative business arrangements for upfront capital and on-going operational subsidies between the mobility service provider and the Nation outside the current funding streams will need to be negotiated and established before a mobility service provider will extend service. It is expected that specific funding streams to establish cellular connectivity in remote communities will become available in the future.

Recommendations and Next Steps:

2. *Given the complexity of the transport infrastructure to be designed and implemented before the access network can be built, detailed discussions with the Nation are required before next steps can be charted.*

VILLAGE OF POUCE COUPE

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	1
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	1

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

Village of Pouce Coupe

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

See observations below

Stakeholder Engagement:

Confirmation by Email

Key stakeholder comments:

Pouce Coupe has Shaw cable and modems as well as Telus Modems and Security.

Pouce Coupe has pretty good cellular service though I have heard of "Dead Zones" over by 49 St and 56 Ave. Which is located in the area next to the water tower.

Observations:

Pouce Coupe is the subject of a pending application by a service provider to CCBC for FTTP funding. Regardless of this application, the Pouce Coupe town is shown in the ***National Broadband Internet Service Availability Map*** *data as 50/10 and therefore ineligible for FTTP funding. The likely provider of the 50/10 service is Shaw Cable TV with 50/10 service using hybrid fibre coaxial technology (HFC).*

HFC is capable of much more capacity than 50/10 but can be subject to congestion, and lower data throughput during peak hours if not carefully monitored and managed by the service provider. The service provider must "node split" which involves technicians making physical adjustments in the HFC plant to alleviate internet data congestion. During informal conversations with the Funders, we learned that there are no current funding streams available to upgrade HFC to FTTP, especially for HFC plant like that in Pouce Coupe where the HFC plant is owned and maintained by a major HFC service provider. This might change in the future once the CCBC meets its goal for all BC inhabitants to have access to at least 50/10 by end of year 2027.

There is also a cell tower captured within the community boundaries indicating that the community has cellular service and if not already, can be easily upgraded for 5G services.

Recommendations and Next Steps:

We have no recommendations at this time.

WEST MOBERLY FIRST NATIONS

CONNECTIVITY DASHBOARD

STATUS: JULY 2024

AREA SUMMARY*	Communities
Communities*:	1
Communities with FTTP*:	0
Communities with funded FTTP projects*:	0
Communities with "pending" FTTP funding applications (2024 activity)**:	1
Communities "unaddressed" for FTTP at June 2024:	0
Communities "estimated" to have in-community cellular service***:	0

* As derived from the public data in the "National Broadband Internet Service Availability Map" at https://ised-isde.canada.ca/app/scr/sittibc/web/bbmap?lang=eng#!/map, last update November 2023.

**Total includes communities announced by Connecting Communities BC (CCBC) as being funded in January and March 2024, but not yet included in the "National Broadband Internet Service Availability Map" plus those communities covered by pending funding applications made by service providers to CCBC for the March 2024 and June 2024 funding application intakes.

***In-community cell service is estimated by a cell tower being located within the community boundaries. This is an approximation.

Community list:

West Moberly First Nations

Unaddressed FTTP community list (no FTTP, no FTTP funding and not part of any pending FTTP funding application):

West Moberly First Nations during the stakeholder interview, were unaware of any plans by service providers to extend FTTP to their Nation. We learned subsequent to the stakeholder interview that FTPP for West Moberly First Nations is the subject of multiple applications for FTTP funding.

Stakeholder Engagement:

Verbal by Interview

Key stakeholder comments:

About 3 years ago TELUS installed a cell tower south and east of Moberly Lake but coverage is spotty in the community with no service in key areas. Discussions with TELUS to improve cell coverage seem to have died recently. The Nation views cell phone service as essential for personal safety (payphones are gone, land lines are being dropped to avoid paying for two services).

An extended communication outage due to an extreme weather event in the winter of 2021 was a wake-up call. Land lines and internet were out for 24 hours. Cell service was out for 3 days.

Internet options include fixed wireless access from Indigiinet and PRiS, but speeds are insufficient for today's needs. Starlink is used at the main Admin building and several other band buildings. It is a much better service than fixed wireless access but can still bog down when a lot of staff are working.

West Moberly First Nations has a three-pronged approach to delivering wired broadband services. The first step involves Rogers (Shaw) to complete their funded transport project and provide a transport drop into a Rogers' point-of-presence to be established in the Band Office. This project has been delayed primarily due to permitting issues involving BC Hydro pole access. The transport project is expected to be completed before December 2024.

Once the transport is completed, the Nation plans to build a private "Administration Network" to connect the eight Nation facilities with private fibre including the health center, daycare, and water treatment plant. They issued an RFP for the Administration Network, have retained a contractor, and are pursuing funding through an infrastructure fund with Indigenous Services Canada.

The final step would be to extend the fibre to individual premises in the Nation.

Observations:

The Nation is in the process of executing a plan that has proven successful in other communities and First Nations.

The service providers which have included West Moberly First Nations in their FTTP funding applications appear to have not formally engaged Nation. Should one of these service providers be successful in securing funding, they will need the Nation to show support with a Band Council Resolution (BCR). This FTTP activity could occur in parallel with the Nation's buildout of their Administration Network.

Finally cellular service is spotty. The Nation has tried to engage TELUS Mobility but with the recent reorganization and lay-offs at TELUS Mobility, it is unclear who they should be following up with. This is compounded by lack of funding available for in-community cellular coverage. Available funding for cellular service only addresses unserved highways with access to power.

After the stakeholder meeting with the Nation, we were able to meet with Rogers who confirmed that they had no plans for FTTP deployments within the PRRD. They do however have plans to deploy mobility services which with Rogers' transport site inside the Band Office could present an opportunity for the Nation to explore cellular connectivity with Rogers. It may require that the Nation enter an innovative business arrangement with Rogers to make this happen.

Recommendations and Next Steps:

1. *We have no recommendations regarding the Nations plans for the deployment of broadband. They are following a proven deployment process.*
2. *Given the service providers' interest in deploying FTTP for the Nation and given what appears to be minimal engagement to date with the Nation, we recommend that the Nation adopt a "wait and see" approach to determine the outcome of the funding applications. We recommend reaching out*

to specific FTTP service providers in 2025 if a service provider has not come forward to say that they have received funding for FTTP and asking are for Nation support in a BCR.

3. *Once funded and a service provider committed to proceed, we recommend that the Nation track the FTTP deployment progress and work with the funded service provider to clear any roadblocks for which they have influence such as permitting.*
4. *To advance cellular service in-community and to take advantage of the new fibre transport within the community, it may make sense for the Nation to approach Rogers to determine what level of investment, if any, that the Nation would have to make for Rogers to establish a cell site in the Nation.*

HISTORY - LETTERS OF SUPPORT

Below is a non-exhaustive list of the various Letters of Support that the Peace River Regional District (PRRD) have sent out in support of connectivity in the PRRD:

1. Minister of Citizens' Services and Minister of Innovation, Science and Economic Development
   March 13, 2018
2. Support -TELUS Connect to Innovate Program application.
   August 12, 2019
3. CRTC Canadian Radio-television and Telecommunications Commission
   To express concerns regarding the lack of cell phone coverage to the rural areas of the PRRD
   August 12, 2019
4. Northern Development Initiative Trust (NDIT)
   Support of Vincent Communications grant application to install towers and other supporting infrastructure from Charlie Lake and toward Pink Mountain.
   April 1, 2020
5. Northern Development Initiative Trust (NDIT)
   Support of Shaw Communications for development of a high-capacity fibre optic transport line for the Connecting BC Program
   November 16, 2020
6. Northern Development Initiative Trust (NDIT)
   Support of TELUS application for the Connecting BC Program - Economic Recovery Intake – TELUS Pure Fibre to Bear Flat Etc.
   November 16, 2020
7. LETTER from Petronas that supports PRRD for Connectivity Study with Valo Networks
   March 30, 2021
8. Innovation, Science and Economic Development Canada
   Support of TELUS application for Universal Broadband Fund grant to improve existing wireless connectivity in various areas, (Bear Flat, Farrell Creek, Mount Wabi, East Pine, Farmington, Septimus, Taylor, Moberly Lake, Tupper, Goodlow, etc.
   November 25, 2022
9. Sent by Tumbler Ridge to Connecting Communities BC Ministry of Citizens' Services
   Support of TELUS PureFibre connectivity
   November 30, 2022
10. Sent by PRRD to Connecting Communities BC
    Support of TELUS grant application Pure Fibre Connectivity
    April 21, 2023
11. Sent by City of Dawson Creek to Connecting Communities BC
    Support of TELUS application under the Connecting Communities BC Fund, to provide PureFibre connectivity
    April 24, 2023

12. Sent by Village of Pouce Coupe to Connecting Communities BC
    Support of TELUS application Connecting Communities BC Fund – Pure Fibre.
    August 22, 2023
13. Minister of Energy Mines and Low Carbon Innovation
    Support of Provincial Policy to allow Internet Service Providers timely access to Passive Infrastructure for telecommunication facilities.
    May 23, 2023
14. Canadian Radio-television and Telecommunications Commission (CRTC)
    Support of TELUS application to build Fibre transport - Tumbler Ridge Diversity
    June 21, 2024
15. PRRD Support to Connecting Communities BC
    Support of Canadian Fiber Optics – Grant application for Project Borealis
    June 2024
16. PRRD Support to Connecting Communities BC
    Support of NorthwesTel project in Electoral Area B along Alaska Highway
    July 15, 2024

GLOSSARY OF TERMS

50/10: The universal broadband standard defined by the CRTC as 50Mbps downstream to the home and 10Mbps upstream to the network

3G: Cellular third generation technology used for voice services

4G: Referred also as Long Term Evolution or LTE, fourth generation cellular technology that supports voice services, internet browsing and video streaming.

5G: Fifth generation cellular technology that supports voice services, high-capacity internet browsing, higher resolution video streaming and other advanced services requiring sustained high-capacity connections

Backhaul: the connection from a network location such as a wireless cell tower to the network core such as the internet.

Broadband: a high-capacity transmission technique using a wide range of frequencies, which enables many messages to be communicated simultaneously.

BCE: Bell Canada Enterprises

Capex: Capex are capital expenses incurred by the service provider to install or upgrade physical plant assets to implement connectivity projects. These funds are often subsidised or offset to some degree by government grants.

Canadian Radio-television and Telecommunications Commission (CRTC): an independent public authority in charge of regulating and supervising Canadian broadcasting and telecommunications.

Connecting Communities BC Fund (CCBC): Broadband connectivity fund with annual or semi-annual funding application intakes lead by the Province of BC in 50/50 partnership with Innovation Sciences and Economic Development (ISED) Canada for FTTH deployments

DSL: Digital Subscriber Line. Internet delivery technology using standard telephone, copper twisted pair wires

Ethernet: the traditional technology for connecting devices in a wired local area network (LAN) or wide area network (WAN). It enables devices to communicate with each other via a protocol, which is a set of rules or common network language.

Fibre To The Home (FTTH) also referred to as Fibre To The Premises (FTTP): the installation and use of optical fiber from a central point directly to individual buildings such as residences, apartment buildings and businesses to provide high-speed internet access. FTTH dramatically increases connection speeds available to computer users compared with technologies now used in most places.

Incumbent Local Exchange Carrier (ILEC): local independent telephone companies providing local telephone exchange services in specified geographical locations.

ISP: Internet Service Provider - an organization that provides services for accessing, using, or participating on the Internet.

Last mile connection: the final stretch of cable that comes into a house and gets residents connected. The main line runs into the neighborhood and then splits off into individual “drop lines” that run into neighbourhood homes.

Low Earth Orbit (LEO) satellites: a satellite that circles around the earth at lower altitudes than previous satellites which allow an improved performance for communications. LEO satellites orbit between 2,000 and 200 kilometers above the earth.

Mbps: Broadband speeds are measured in 'megabits per second', often shortened to Mbps. Bits are tiny units of data, with a megabit representing a million of them. The higher the number of Mbps (megabits per second), the speedier the online activity should be.

MPLS: Multiprotocol Label Switching - a networking technology that routes traffic using the shortest path based on “labels,” rather than network addresses, to handle forwarding over private wide area networks.

Northern Development Initiative Trust (NDIT): Agent for the BC Government currently administering Provincial funding for eligible service providers to provide cellular service along currently unserved highway segments.

Opex: Operating expenses are funds incurred by the service provider to operate and maintain the services needed to provide the service to end users. These funds are not at present subsidised by government grants.

PoP: Point-of-Presence – a location within a community where the transport network ends and the FTTH network starts. It is often a central office run by the ILEC.

Transport Fibre: the connection from a FTTH network to the ISP' network core and their internet gateway.

UBF: Universal Broadband Fund

VPN: Virtual Private Network - an arrangement whereby a secure, apparently private network is achieved using encryption over a public network, typically the internet.