County of Minburn No. 27

Broadband Discovery

August 13th, 2021

Contents

1 DEFINITIONS

Term	Definition
AVL	Automatic Vehicle Location
Backhaul	An ISP will connect many last-mile connections to a high-bandwidth backhaul network. All users share the capacity provided by the backhaul and it becomes a chokepoint for data if not sufficiently sized.
Canadian Carrier	means a telecommunications common carrier that is subject to the legislative authority of Parliament; (entreprise canadienne)
CRTC	Canadian Radio-television and Telecommunications Commission
DAQ	Delivered Audio Quality
DSL	Digital Subscriber Line, high-speed delivery of information over copper twisted pair cables.
FTTH	Fibre to the Home
Hub-at-home	Fixed access-point that connects over licensed mobile spectrum to provide internet connectivity
ISED	Innovation, Science, and Economic Development
ISP	Internet Service Providers
Licensed links	Licensed point-to-point radio links are carefully selected to avoid interference and guarantee high availability
NBD	National Broadband Database: this data is from the Canadian Government and presented in geographic hexagons.
PoP	Point of Presence for an ISP
PTP	Point to Point
PTMP	Point to Multi-Point
Telecommunications Common Carrier	means a person who owns or operates a transmission facility used by that person or another person to provide telecommunications services to the public for compensation; (entreprise de telecommunication)
The County	County of Minburn
Unlicensed links	Unlicensed point-to-point radio links uses shared frequencies no allocated to specific locations. These links are subject to interference and less reliable than licensed links.
VSAT	Very Small Aperture Terminal
Wireline	Data connections that are hard-wired using cables, e.g. phone cables
Wireless	Data connections that use wireless links

Table 1: *Definitions*

2 EXECUTIVE SUMMARY

The objective of the discovery document is to confirm the existing state of broadband within the County of Minburn.

To accomplish this objective, this discovery document describes the following:

1. The state of technology infrastructure within the County of Minburn that support broadband services.
2. The existing ISPs and their anticipated coverage areas based on tower locations.

Key conclusions are as follows:

1. The majority of County residents and businesses are underserved by current Internet services, with the rural area of the County not meeting Canadian Radio- Television and Telecommunications' (CRTC) basic standards for broadband internet
2. Broadband is important to people and businesses. In fact, broadband is now considered an essential service by the CRTC. Internet speed, reliability, and affordability is a key factor people and businesses use when determining where to locate. The federal government has established year-over-year grant funds which ISPs and municipalities across Canada compete for. Successful grant funding submissions thus far in 2021 have been awarded to ISPs and municipalities that have demonstrated shovel-ready projects. The County has no shovel-ready projects, and we see little movement from ISPs to deploy broadband within Minburn County in 2021 and 2022.

A pre-requisite to position the County for future grant funding and delivery of Broadband internet, depends on establishing a policy that states priorities and methods, and a strategy which details a 10-year plan with year-over-year actions for cellular and broadband. With clearly established priorities, the strategy will be appropriate to the geography and economy of Minburn to bridge the divide in the County between today's broadband services to what it needs to meet Canadian Basic Service standards, and to prepare for the next 5 to 10 years. This approach will support the broadband development needed to attract and retain residents and business.

3 THE IMPORTANCE OF BROADBAND

> "*Broadband is connectivity, transmitting all kinds of data beyond web pages or streaming videos. Whether it is used for doing homework on-line, having a business meeting using video conferencing or remotely managing farm sensors from across the field or across the globe, broadband connectivity increasingly impacts our lives."*
> - Understanding Community Broadband, The Alberta Broadband Toolkit.

Broadband is important to people and business. Internet speed, reliability, and affordability is a key factor people and businesses use when determining where to locate.

As part of this study, a variety of residents, agricultural producers, families, and businesses were contacted. Below are some of the ways that broadband connectivity benefits County and rural populations in general.

1. *Large business operations:*
    - Broadband connection must be available 24/7/365 and be of high quality.
    - Local examples include grain elevators, where many utilize off-site servers, telephone systems, and video conferencing in their day-to-day operations.
    - This business market for broadband is expected to grow by 35% to $120 billion in 2021 alone.

2. *Remote working and Learning:*
    - Businesses and municipalities, including ATCO Electric and Strathcona County require that employees working from home have internet that allows them to work as efficiently from home as if they were sitting in the office.
    - Various factors will drive an increase in work from home culture, including cost savings, employee preferences, and climate-change policies.
    - Education is now available to people of all ages and backgrounds online. Having the ability to sufficiently connect will be of profound importance to families and those in the workforce.

3. *Leisure and Connectivity:*
    - Entertainment, news, and conversations have migrated from the television, newspaper, and telephone to the internet, and the demands for adequate internet speed and capacity will only grow.

4. *Retail Ecommerce:*
    - Ability to support customers and suppliers beyond their local economic base and provide products and services worldwide; this allows businesses of all sizes to market to and operate from locations in rural areas.
    - Global ecommerce sales are expected to increase from $3.4 trillion in 2019 to $4.9 trillion in 2021 to $6.4 trillion in 2024 (eMarketer, 2021).

5. *Reduce chokepoints and provide infrastructure for current and future technologies:*
    - Recent events and changes have increased the demand on internet capacity, including remote learning, work, and streaming.
    - Upcoming technologies, including autonomous vehicles, 5G wireless, internet of things, and Artificial Intelligence (AI) will further drive the need for fast and reliable internet and the hardware required to provide that.
    - Towers used for broadband will be vital to facilitate ancillary technologies, while also providing the potential for increased cellular and GPS coverage.
    - Technology requirements of streaming services, video conferencing software, and email servers, will require faster speeds; in other words, today's speeds will not be able to maintain status quo over the mid to long-term.

In other words, Broadband has become an essential component for many people and businesses. In fact, the CRTC has listed Broadband as an essential service. While further investigation is needed to better determine the needs and preferences of County residents, it is reasonable to surmise that adequate internet service is becoming a determining factor to where people and business decided to locate.

4 COUNTY REQUIREMENTS

The County of Minburn has no broadband policy or long-term strategy. Both are necessary to ensure year-over-year broadband planning and alignment with existing and future broadband grant funding.

Rural Broadband Requirements:

1. *Availability*
    - Providing enhanced coverage that aims to support current broadband standards along with consideration for future needs.
2. *Affordability*
    - Service offerings enhanced or newly developed to remain comparable and competitive with local service providers for business and residential broadband.
3. *Quality*
    - Adherence to industry standards and best practices for design, implementation, and operations of infrastructure and networking options.
    - Currently, acceptable residential broadband is considered 50Mbps DL/10Mbps UL.

Future Policy:

Ideally, a Council policy on broadband would confirm broadband requirements, establish the importance of Broadband to the County and the direction it wished to follow. In particular, it would list broadband priorities for people and businesses and map the County's strategic interests in achieving greater connectivity. It would also establish high-level guidance for the County's role with broadband delivery. A more detailed broadband strategy would follow, which would drive the County towards future shovel-ready projects necessary for grant funding submissions.

5 EXISTING STATE OF BROADBAND ACCESS

The current state of broadband in the County of Minburn is inadequate: the only areas within Minburn that have stated a 50/10Mbps service level are at Vegreville and Mannville; reference Figure4. Penetration of wireless ISP sites in the County is common along Highway 16, but much less-common away from there.

Current Speeds:

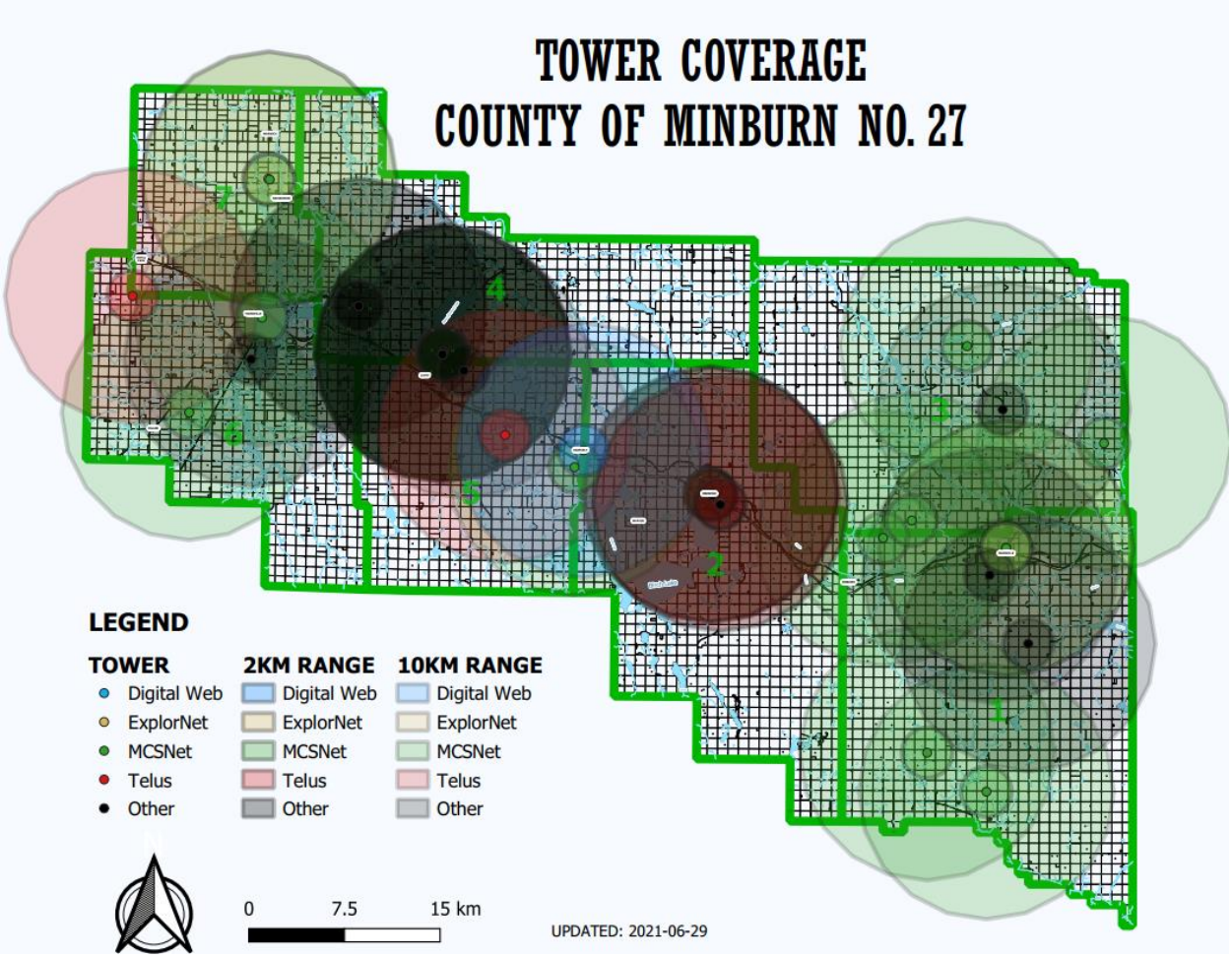
As outlined in Table 4, the County undertook a small survey of available residents and businesses to establish a sample of current internet speeds. Due to poor coverage in the Wapasu area and north of Minburn, residents were locked out of the speed test and unable to provide their results. The Vegreville areas seems to have better speeds than those areas north and south of Innisfree. Based on these findings and conversations with residents and businesses, its apparent that the broadband is not up to par with industry standards.

Location	Download Speed	Upload Speed	Provider
Warwick area	28.00	8.00	MCSNet
North of Vegreville	17.00	18.00	MCSNet
North of Vegreville	13.50	4.50	MCSNet
NE of Vegreville	24.00	5.60	MCSNet
Inland	33.00	33.00	Xplornet
SW of Vegreville	1.00	0.80	CCI Wireless
North of Innisfree	6.10	2.80	Telus SmartHUB
SE of Vegreville	15.10	1.50	Xplornet
Wapasu	Unable to Connect	Unable to Connect	MCSNet
North of Mannville	Unable to Connect	Unable to Connect	MCSNet

Table 4: *Sample of Current Internet Speeds – June/July 2021*

❖ ***Tower Coverage:***

The County has provided the following data on tower locations and approximate coverage areas. It is important to note that this information is anecdotal and would require further study to determine accuracy and completeness:



❖ ***The Last Mile:***

Last-Mile refers to the internet connection to a business or household. To extend internet to a rural property, an ISP will connect the many individual connections to a 'backhaul,' which is the connection to the internet source. All users share whatever the capacity the backhaul can handle. This often becomes a chokepoint for data when not sufficiently sized.

5.1 Last-Mile Solutions

In the County of Minburn, most of the connections are ISP Wireless and TELUS Smart Hub data connections.

Backhaul

High speed, gigabit backhaul in the County is shown in Figure 1, which shows hexagons from the National Broadband Database (NBD). The hexagon would contain at least one high-speed

backhaul connection from either Shaw, TELUS, or Axia. The costs of access to the high-speed connection are not shown on the map, but generally exceed $100k.

The resolution of the hexagon is poor and shows rural areas covered that may not be covered.

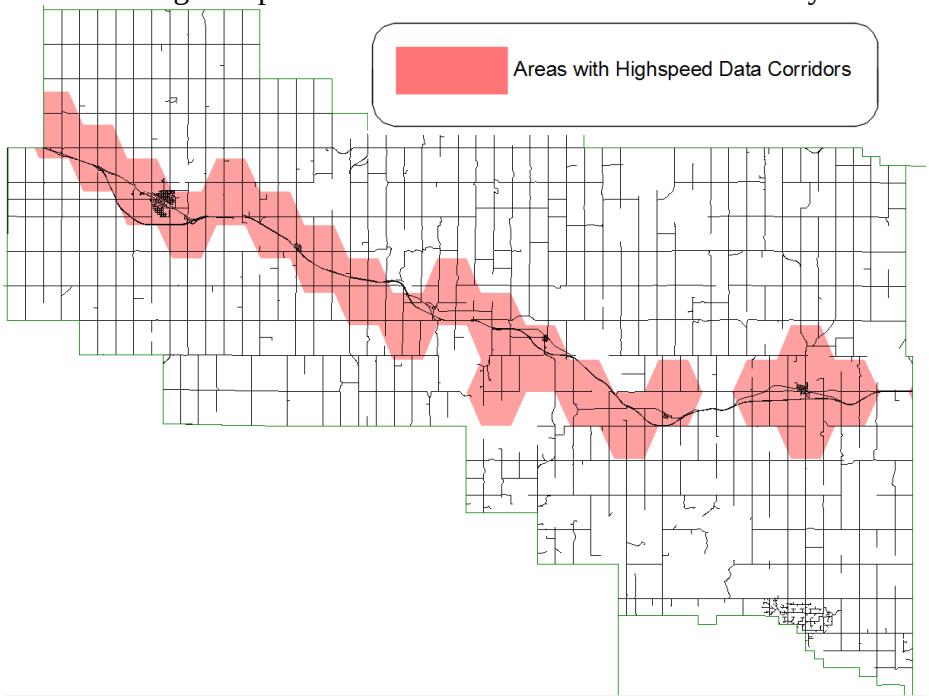


Figure 1: *County of Minburn Mile Gigabit Backhaul*

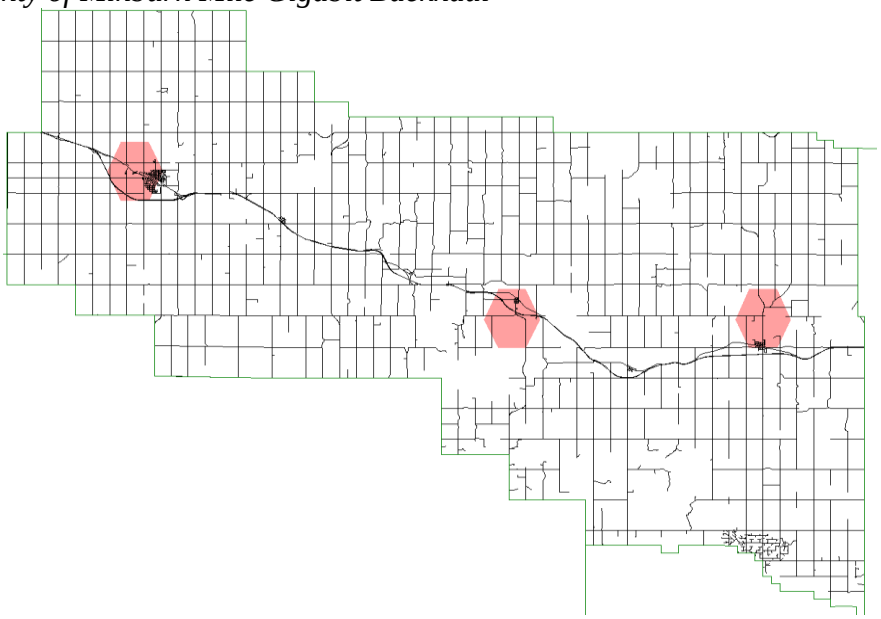


Figure 2: *SuperNet Points of Presence for Gigabit Backhaul*

5.2 Last Mile Connectivity

*Note: *The figures in this section are extracted from data available as part of the national broadband data base.*

The last-mile delivery methods vary from fibre, coaxial, and copper cables (digital subscriber line) to ISP wireless (Home Hubs and Wireless access-point); the County only has two locations which offer 50Mbps downlink and 10 Mbps uplink: Vegreville and Mannville.

The County is shown as being completely served for 25Mbps downlink and 5 Mbps uplink using wireline and wireless delivery methods, reference Figure 3.

Officially, the federal government shows 50Mbps downlink and 10 Mbps uplink service at the locations in Figure 4.

A further investigation of where 50Mbps downlink and 10 Mbps uplink may be offered is shown in Figure 16. However, without sufficient backhaul, internet service will not be able to achieve these data speeds.

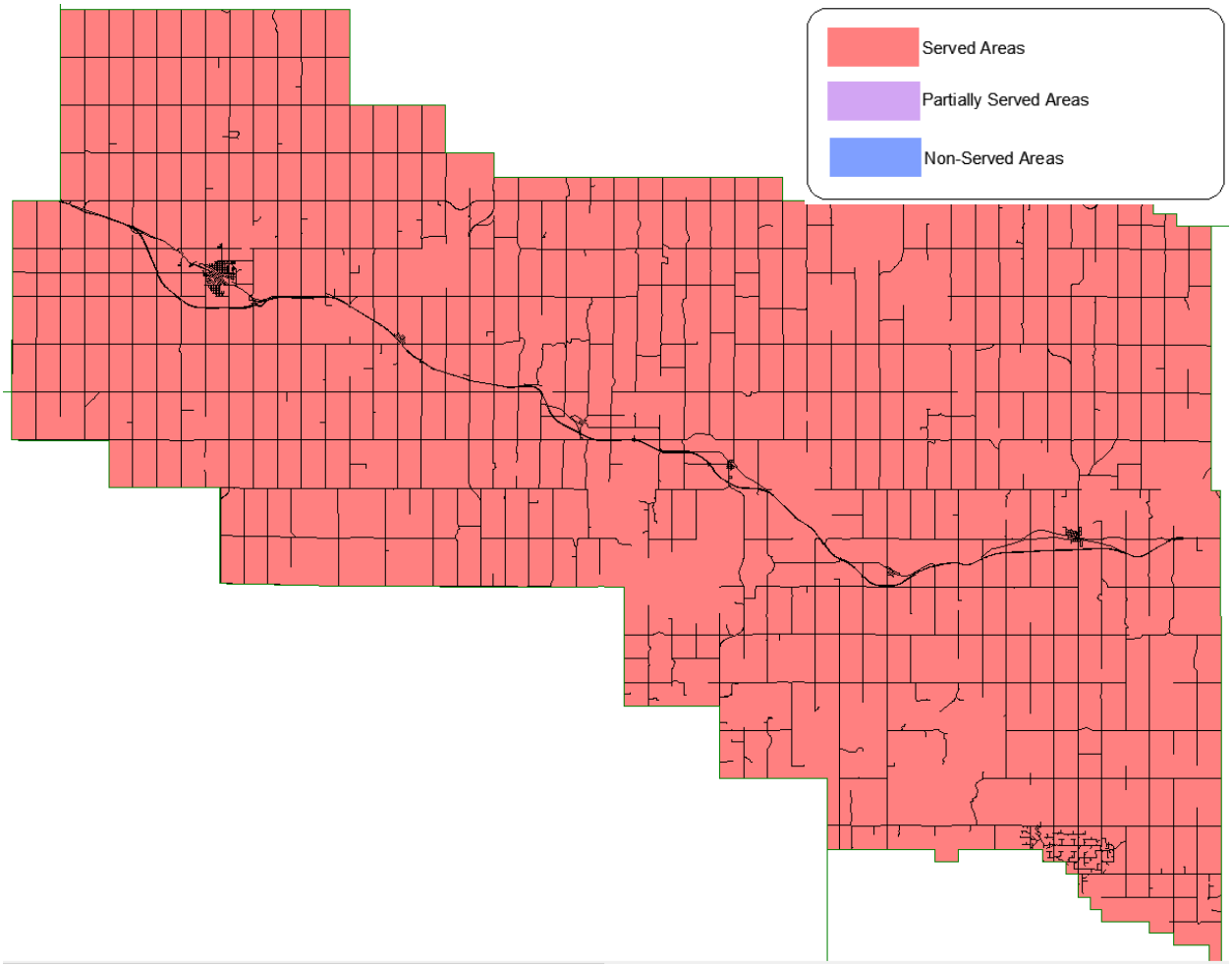


Figure 3: *Canadian Broadband Served Areas of 25Mbps Down, 5 Mbps Up*

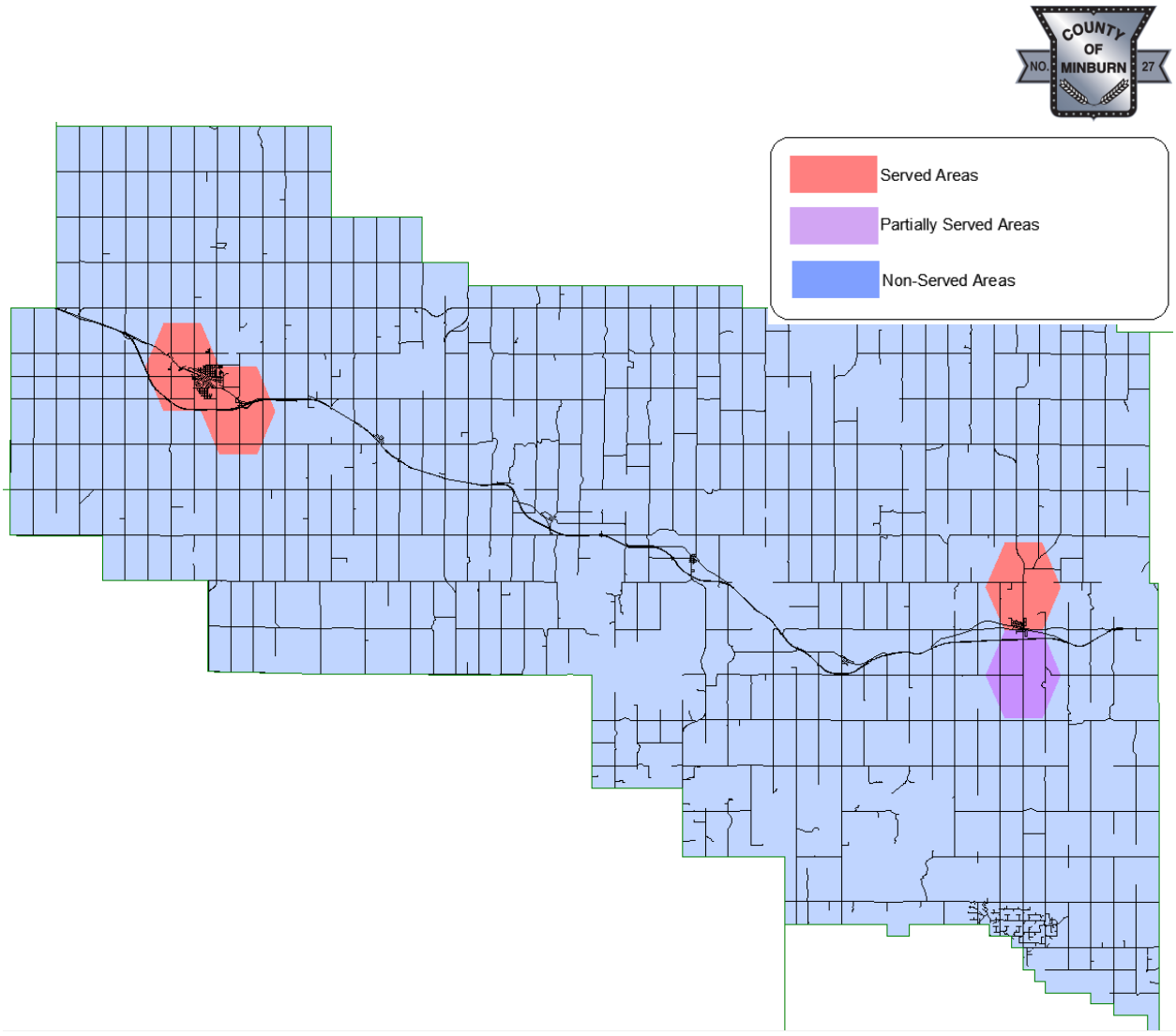


Figure 4: *Canadian Broadband Served Areas of 50Mbps Down, 10 Mbps Up*

5.3 Internet Service Providers (ISPs) in the County:

The following ISPs provide Internet in the Count of Minburn:

1. TELUS
2. Bell
3. Xplornet/Corridor Communications
4. Digital Web
5. MCS Net
6. Wire IE
7. Shaw

Some ISPs publish their coverage on the web and/or have registered their coverage areas with the National Broadband Database (NBD), including TELUS, MCS Net, Xplornet, Shaw, and Digital Web.

Of these ISPs, TELUS, Xplornet/CCI use licensed digital backhaul; reference Figure 8. No licensed backhaul within Minburn was found for MCS Net and Digital Web. Information was not available where the ISPs had data backhaul fibre/VDSL/DOCSYS ground connections.

Some ISPs were only discovered by searching at licensed links; these include 3CIS, Wire IE. It is likely they service targets clients like Cenovus or Alliance.

TELUS, Rogers, and Bell are registered as mobile wireless carriers with the NBD.

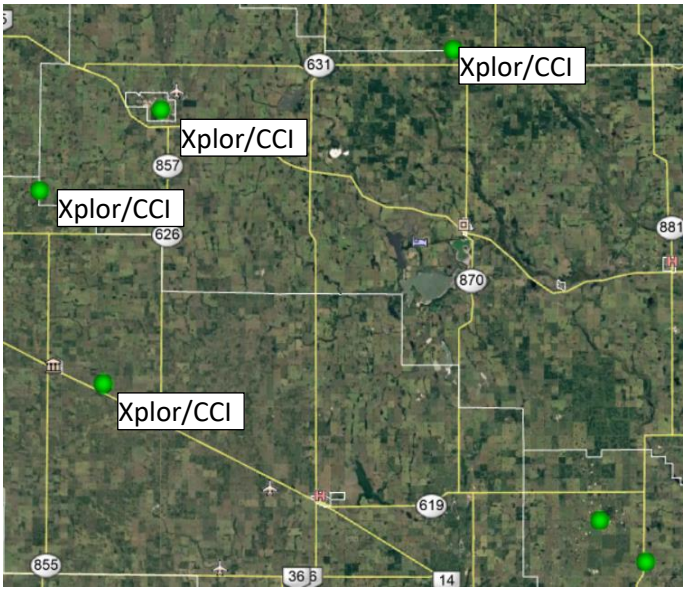


Figure 5: *Licensed Point-to-Point under 26GHz, excluding TELUS*

5.4 MCSNet

No licensed links were found for MCS-Net, meaning its internet services is subject to interference due to operating on open frequencies. MCS-Net offers both business and residential internet. Several towers have been placed by MCS-Net, as shown in Figure 7, which is probably incomplete due to the ISP not making this information readily available.

MCS-Net currently has started a project to provide fibre connections from its tower-sites in East Vermilion to Axia high-speed backhaul.

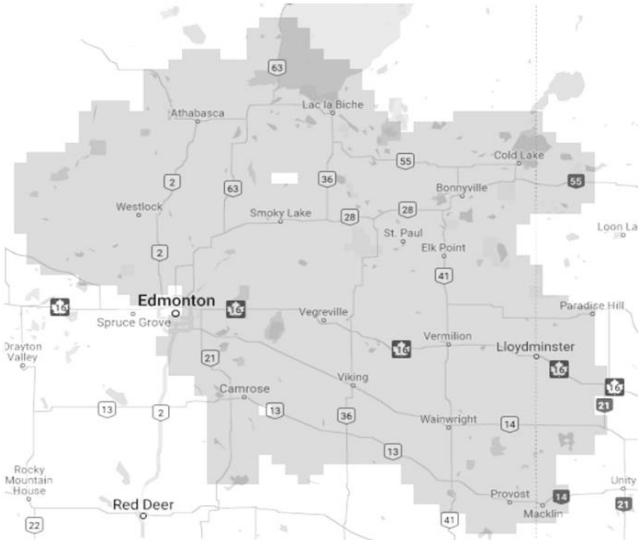


Figure 6: *MCS-Net Coverage, published by MCS-Net*

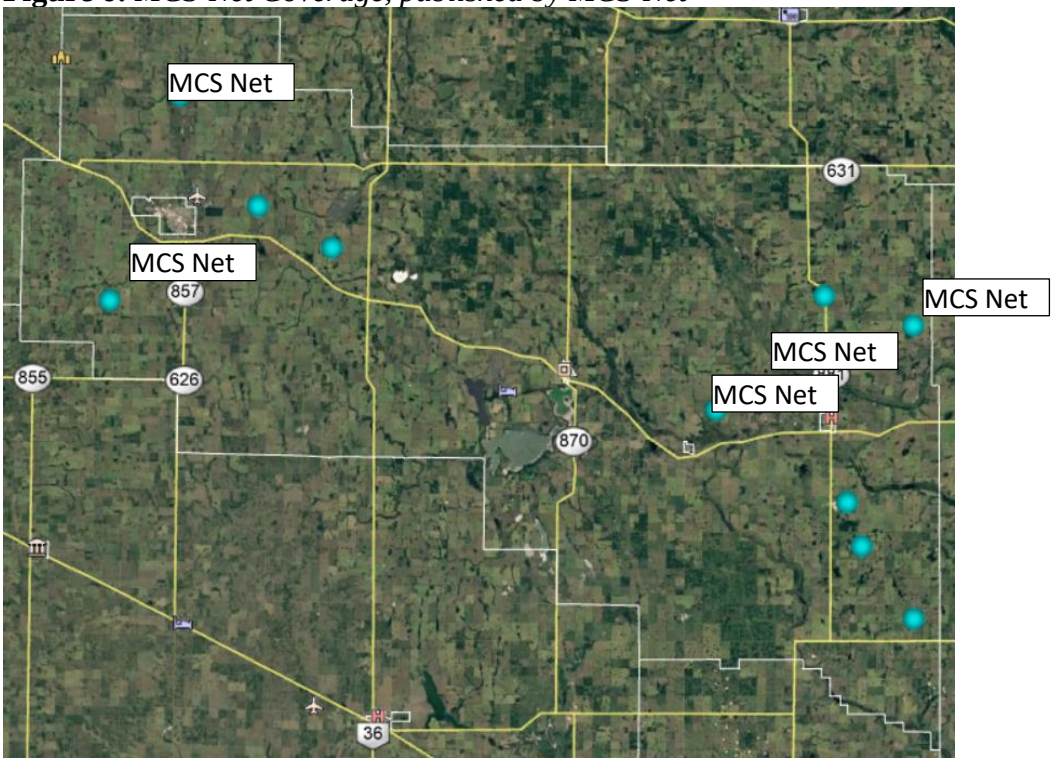


Figure 7: *Tower-Map Provided by County*

5.5 Xplornet/CCI

Xplornet/CCI has several licensed links; they offer both business and residential internet. Figure 8 shows CCI's coverage as provided to the NBD, while figure 9 shows the same for Xplornet. Since the recent merger of these two companies, these maps can be combined, making the advertised coverage area County-wide.

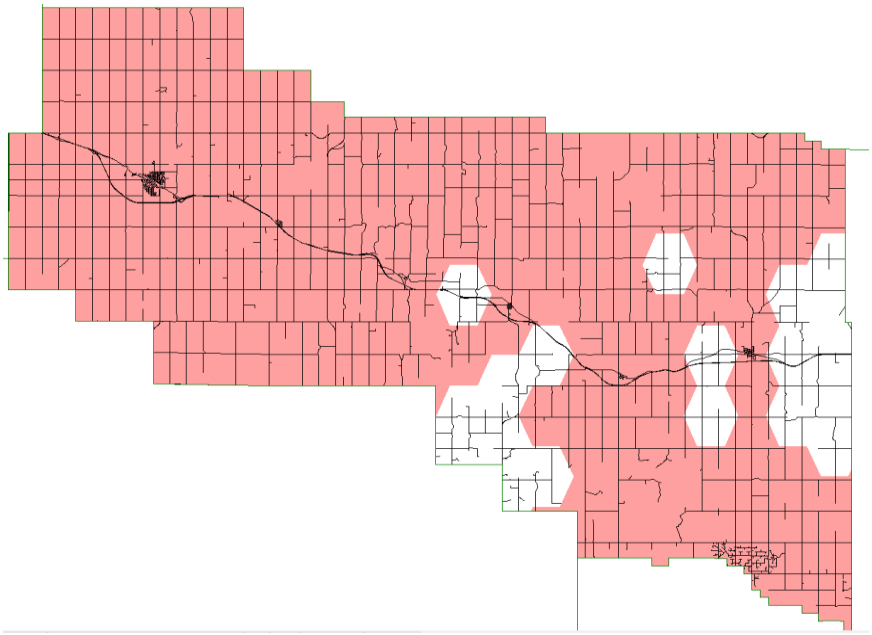


Figure 8: *CCI Coverage*

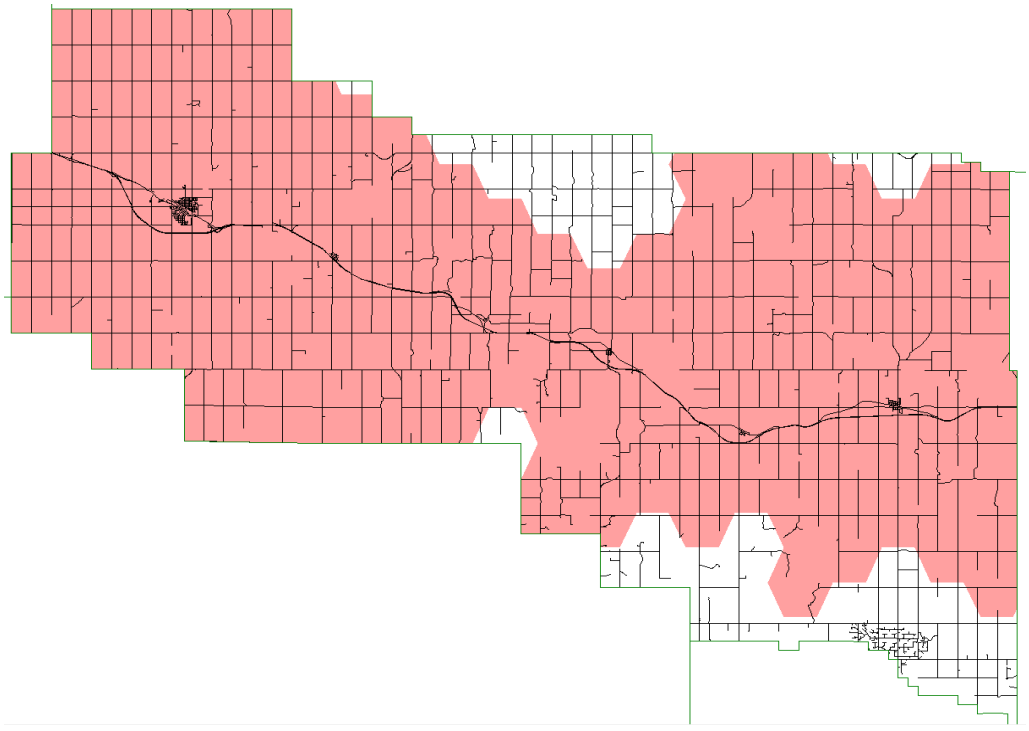


Figure 9: *Xplornet Coverage*

5.6 Digital Web

Digital Web offers both residential and business internet. Digital Web likely uses few, if any, licensed wireless backhauls.

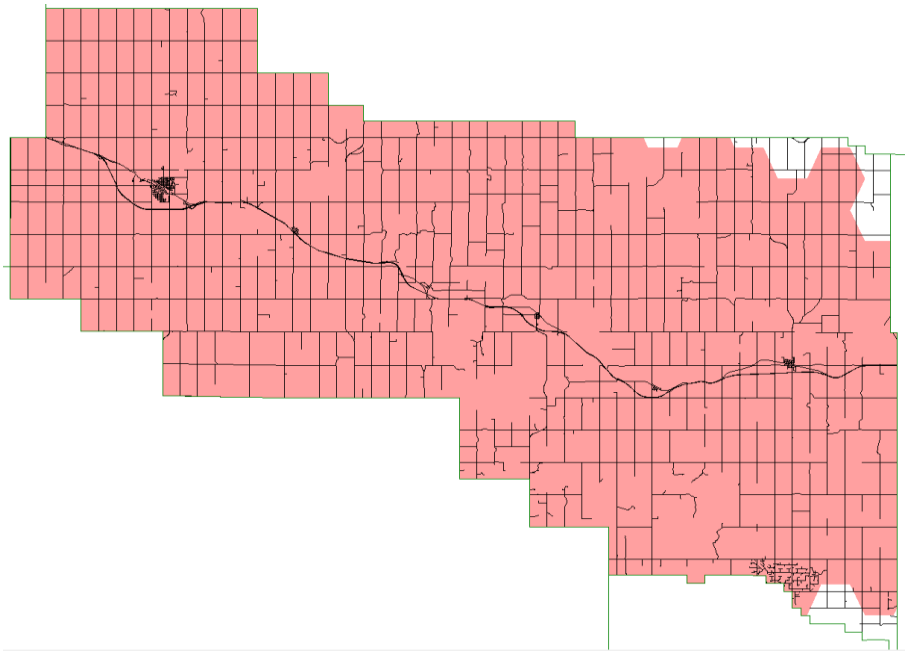


Figure 10: *Digital Web*

5.7 TELUS

TELUS offers hub-at-home service internet. As far as can be determined, TELUS only uses licensed frequencies.

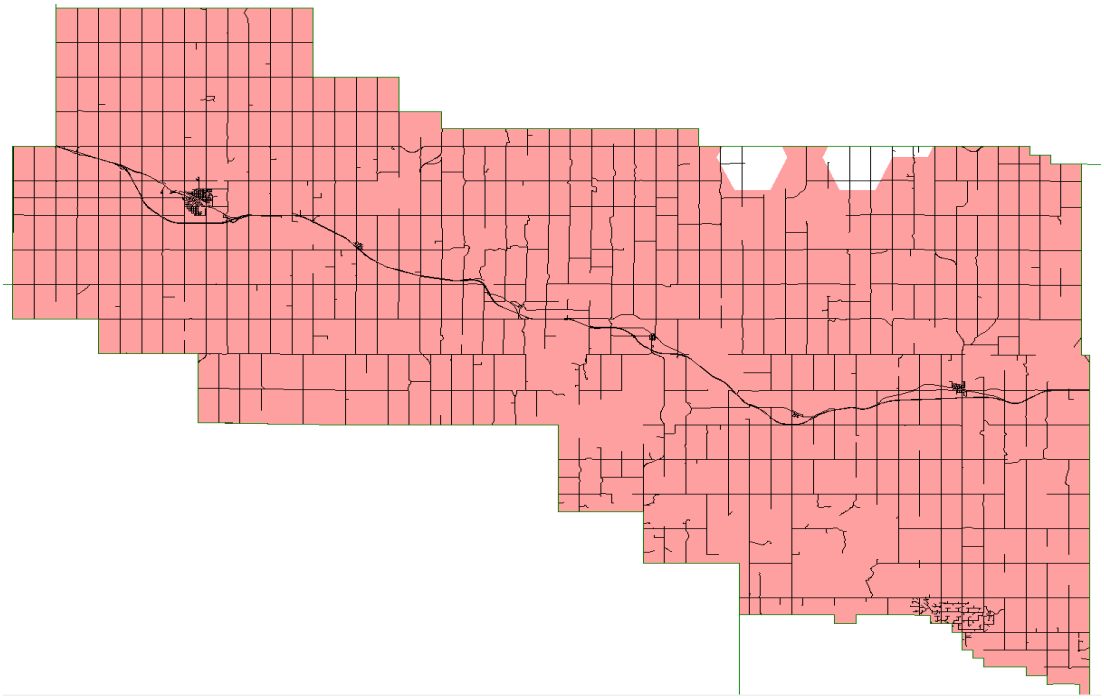


Figure 11: TELUS Fixed Wireless Coverage

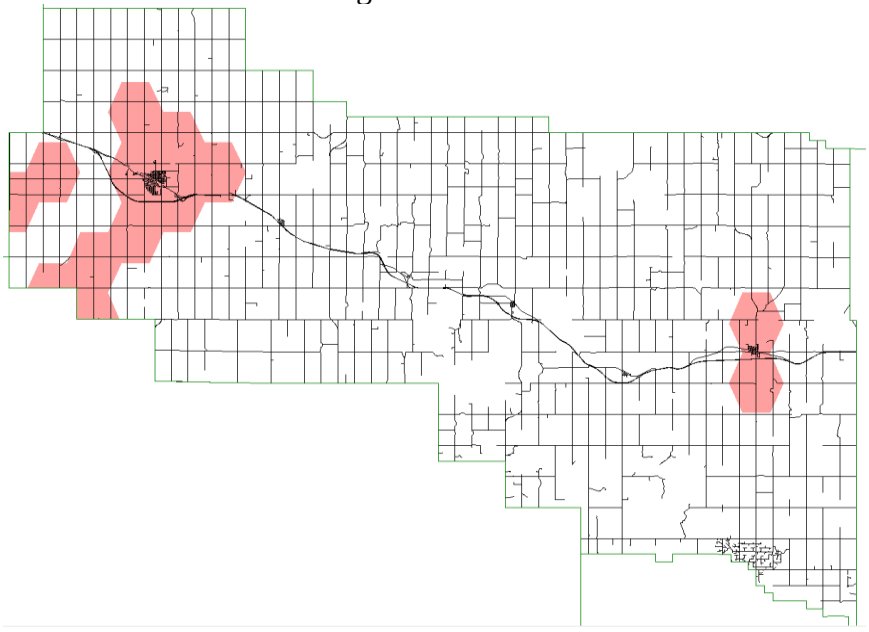


Figure 12: *Digital Subscriber Line from TELUS*

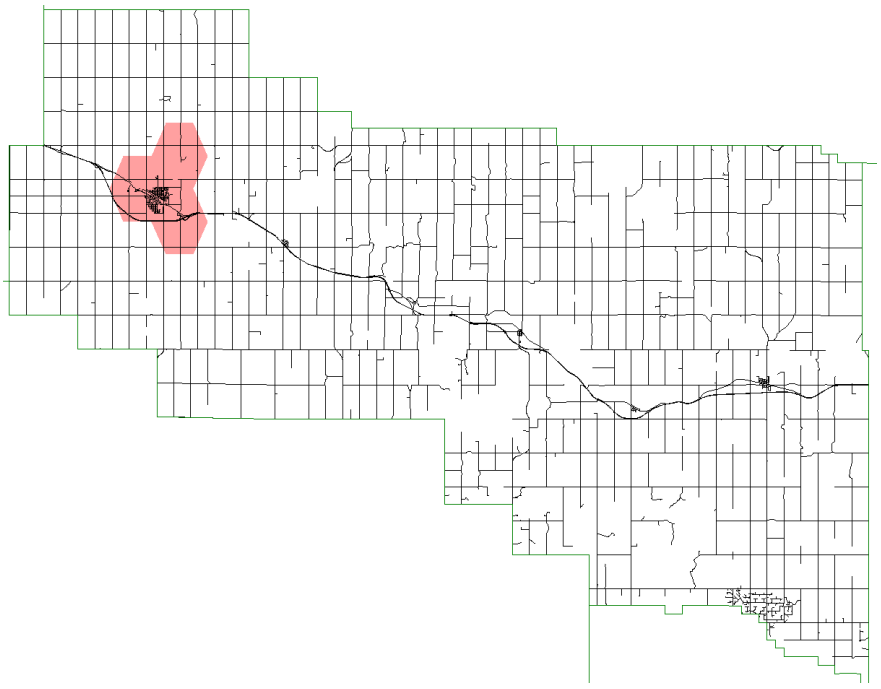


Figure 13: *Fibre to the Home (TELUS)*

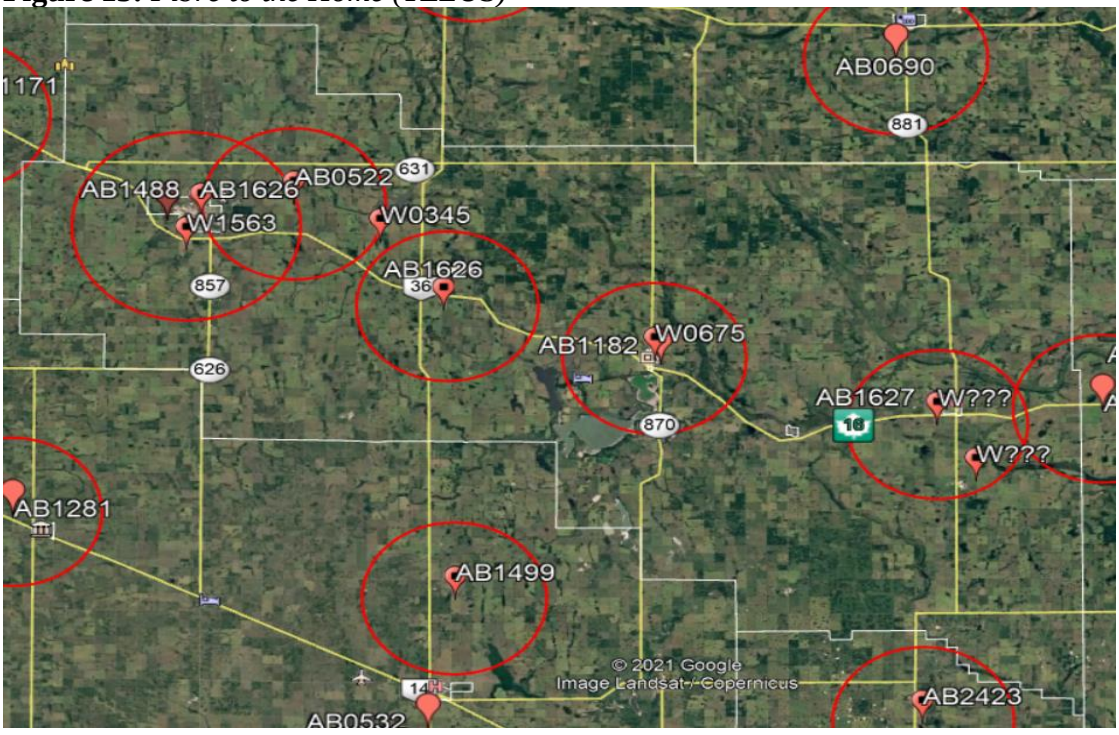


Figure 14: *TELUS Tower Assets*

5.8 SHAW

SHAW offers internet over coaxial cable and has a published service area around Vegreville.

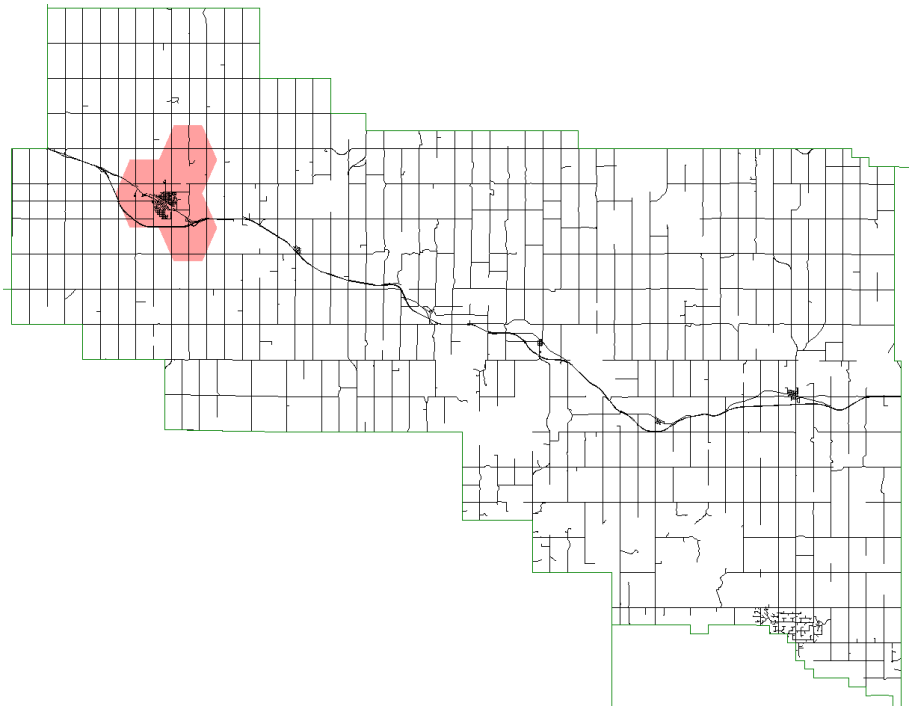


Figure 15: *Coaxial Cable (Shaw)*

6 LAST MILE CHALLENGES

Broadband data is limited because it relies on information provided by ISPs, which can be dated. However, current data has been obtained through other methods and is reproduced in this section.

Figure 16 shows where the ISPs should be able to provide 50/10Mbps. The ISPs often advertise their networks as offering 50/10Mbps, but rarely deliver those speeds, largely due to some or all of the following factors:

1. Over-subscription of last-mile sites
2. Last-mile coverage is unlicensed and subject to interference
3. Backhaul sites are over-capacity
4. Backhaul sites have reduced capacity caused by interference.

The ISPs will need the following upgrades to their networks:

1. Additional last-mile sites closer to users
2. Increased backhaul at the last-mile wireless site
3. Increased access to data off high-speed data corridors
4. Tighter sector antennas
5. More licensed backhaul to reduce interference
6. Use of licensed last-mile frequencies; currently only TELUS, Rogers, and CCI/Xplornet have this capability in the County.

Approximate 50 Mbps downlink, 10 Mbps uplink coverage was projected from the existing ISPs in the County and shown in Figure 16. Information was pulled from Industry Canada and coverage plots from existing ISP and cellular networks. Some tower locations will be +/-1km from their actual locations. The plots shown are based on typical coverage for the Cambium 450i product to support QPSK and 16QAM; these modulation levels were assigned to 10-25Mbps download and 50Mbps download, respectively. A formal coverage study was not done. Instead, a 10km contour was used for QPSK and a 5km contour was used for 16QAM; taller sites' coverage radials were increased 40%. These contours were developed from a formal point to point analysis on flat earth Northeast of Vauxhall.

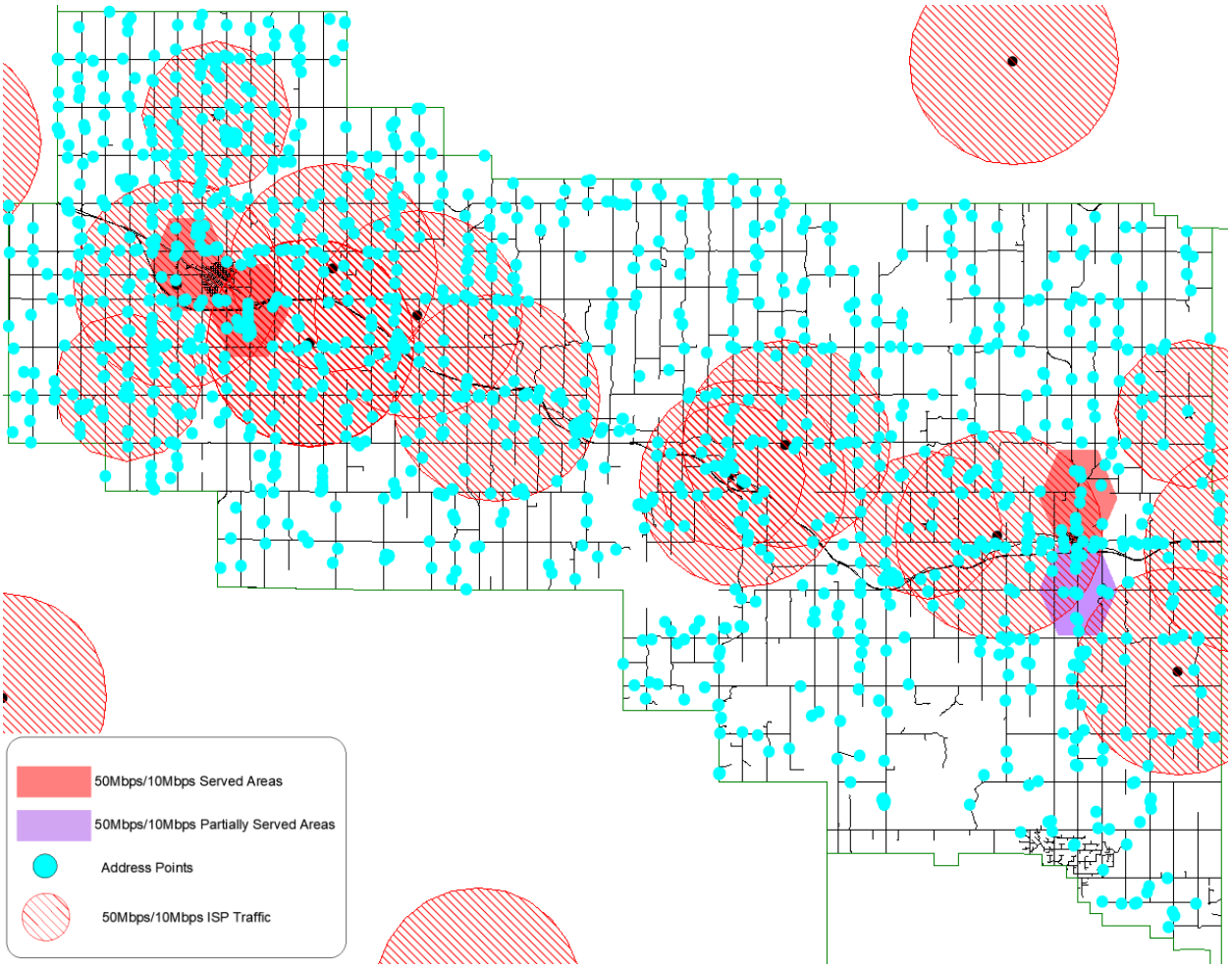


Figure 16: *Areas of Poor, Projected Last Mile Coverage at 50Mbps Down, 10 Mbps Up*

6.1 The TELUS Advantage

TELUS enjoys a significant amount of fibre and tower infrastructure in the County, including:

1. Fibre along Highway 16
2. Over 15 significant tower assets providing coverage in the County
3. Fully licensed spectrum

7 FUNDING OPPORTUNITIES

There are several grant funding and debt-funding opportunities available to Minburn County.

The ones immediately available are:

1. Federal Grants:
    - The County of Minburn can partner with an ISP to apply for the Universal Broadband Fund (UBF) and CRTC Broadband Funds. Applications are closed as of June 2021 but are expected to recur annually.
2. Canadian Infrastructure Bank (CIB)
    a. The County of Minburn can apply for debt financing using the Canadian Infrastructure Bank. The CIB "*Growth Plan"* has allotted $2 billion for broadband initiatives alone.
3. Provincial Funding
    a. As part of Alberta's Recovery Plan, the Alberta government will invest up to $150 million to expand and improve broadband in rural, remote, and Indigenous communities.

Other grant funding and debt funding programs are further described in Appendix A. The information is provided for greater context and the potential that government may renew some of the programs.

8 BROADBAND AFFORDABILITY

Sample Broadband data rate plans are compared for affordability in Table 5.

	Telus	Xplornet	Starlink	MCSNet
Data Speeds Offered	25Mbps DL Uncertain UL	10 - 50Mbps DL Uncertain UL	120Mbps DL 10-20Mbps UL	30Mbps DL 5Mbps UL
Activiation Fee	$0	$49	$650	$0 - $200
Monthly Fees	$70 - 120	$40 - $100	$130	$50 - $200
Notes:	Information is current to March 2021			
	Starlink is still in beta testing and has not released any data regarding coverage areas			
	Monthly plan pricing varies based on desired speeds and data caps			

Table 5: *Data Rate Plans*

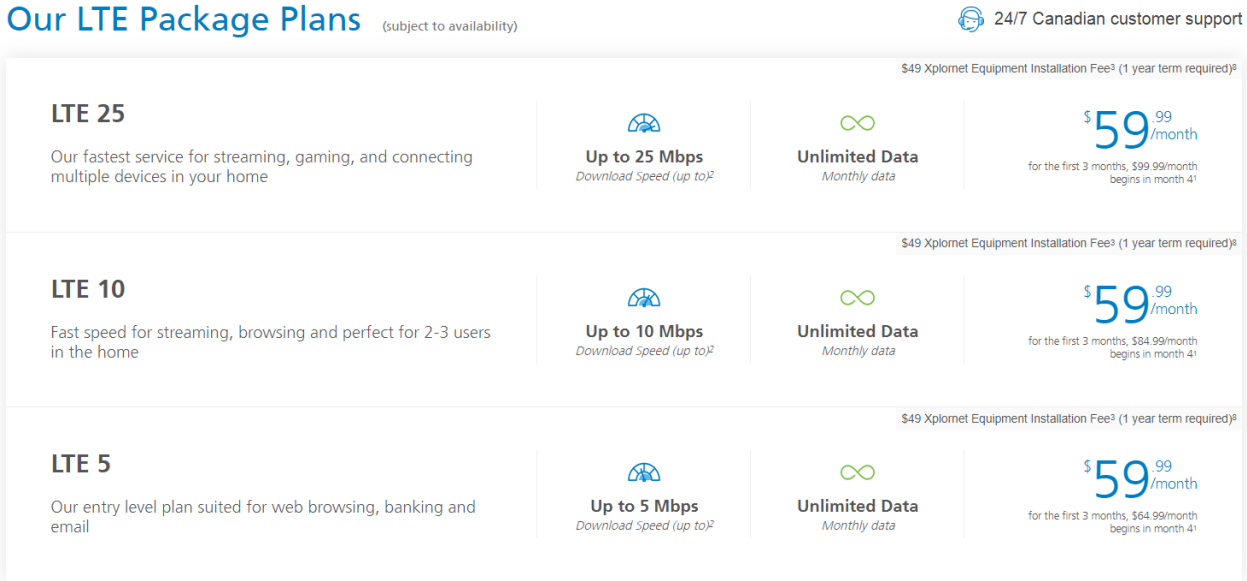
8.1 TELUS SmartHub Pricing

TELUS Smart Hubs Traffic rates have the following caveats:

1. *TELUS manages Internet traffic on small portions of our wireless network to ensure our customers have the best Internet experience possible during cell tower congestion.*
2. *This policy only impacts a small number of Smart Hub customers in communities where demand for Internet usage is greater than the available network capacity.*
3. *Only at times of congestion, a small number of customers using the most bandwidth will be affected and may notice slower speeds. This will allow us to provide both our Smart Hub and mobile wireless customers consistent and reliable Internet speeds.*
4. *We manage Internet traffic by identifying congestion on portions of our network. Only at time of congestion, TELUS will redistribute network capacity across our wireless network by temporarily reducing the speed of the few heavy Smart Hub users who occupy the most traffic bandwidth.*

Product name		Due monthly
Connection Fee		$0.00
ZTE MF279 Smart Hub ○ Black		$0.00
Wireless Internet 1TB		$115.00
	Subtotals	$115.00
	Shipping	FREE
	Taxes (GST)	$0.00
Accepted payment options	Totals	$115.00 Due monthly

8.2 Xplornet Data Plans



8.3 Starlink Data Plans

Starlink Satellite service is expected to be about $125 – 150 per month, and a $600 - $800 one-time equipment purchase and activation. The program is currently in beta testing with commercial launches in Alberta likely in 2022. For this reason, it is difficult to ascertain the overall applicableness to rural areas currently.

8.4 MCSNet Data Plans

MCSNet Plans range from $50 – $200 per month with an additional $20 - $30 per month IP address add-on option. The installation is free unless one decides to go with a 'no term' option; in which case the installation fee is $200.

MCS NET

Internet Packages

Package	Monthly Fee	Monthly Traffic
Basic	$49.95	50 GB
Advanced	$59.95	125 GB
Ultra	$79.95	600 GB
Extreme	$99.95	1000 GB
Extreme Unlimited	$149.95	Unlimited
Extreme Unlimited Pro*	$199.95	Unlimited

In some more densely populated areas, the monthly fee is $10 less
Pre-authorized payment (PAP) through bank (EFT) or credit card is required when using all packages with the exception of the Extreme packages on the No Term contract
All packages include 1 Dynamic IP Address
*Next Business Day Service Guarantee, Dedicated Support Line
Download Speeds are limited only by the radio signal. Typical users will experience speeds up to 30 mbps down / 5 mbps up.

IP Address Add-on Options

IP Addition	Monthly Fee
2 Static/Dynamic IPs	$19.95
5 Static/Dynamic IPs	$29.95

Contract and Installation Cost

Contract Term	Installation Fee
2 Year	Free
No Term	$199.95

Pre-authorized payment (PAP) through bank (EFT) or credit card is required when using the free installation option

9 CONCLUSION

This document has attempted to summarize the status and importance of broadband internet in the County of Minburn No. 27. The preliminary conclusions are:

1. Broadband is of significant value to County residents and businesses and its importance will only grow.
2. The current state of broadband is inadequate according to the CRTC's most recent objectives.
3. There are several ISPs operating in the County, but Telus has a disproportionate share of the tower and fibre infrastructure.
4. There are potential funding streams should the County decide to pursue a more comprehensive broadband strategy, probably in partnership with an ISP.

The primary barrier facing rural areas is the low return on investment to many ISPs. In other words, without significant capital support from government, private companies are having difficulty making the investments required to improve and expand internet services in rural Alberta.

Looking Forward:

Should the County see value in pursuing broadband improvements, the next step would be to commission a project that builds on the findings of this study and seeks to accomplish the following 3 objectives:

1. <u>Community Engagement:</u>
    a. Collect a wide sample of current internet speeds among County residences and businesses.
    b. Conduct an opinion survey or poll on the importance of broadband to County residents and businesses.
2. <u>Coverage and Tower Modeling:</u>
    a. Using proprietary software, model the reach of each tower in the County to confirm which areas are most underserved.
    b. Using similar software, establish ideal locations for future towers that will improve broadband access for underserved areas.
3. <u>ISP and Business Engagement:</u>
    a. Approach various ISPs and businesses regarding their appetite for municipal partnerships for broadband improvements in the County of Minburn, potentially via joint submissions to relevant grant programs.

10 REFERENCES

Number	Reference
1	Decision on the Licence Fee Framework for Fixed Point-to-Point Systems DGSO-004-19; July 2019 https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11532.html
2	ISED News release Residents in 39 communities to get access to new or faster Internet through $22.5-million investment March 15, 2018 – Calgary, Alberta https://www.canada.ca/en/innovation-science-economic-development/news/2018/03/rural-and-remote-communities-in-alberta-will-benefit-from-faster-internet.html
3	Telecom Regulatory Policy CRTC 2016-496" Canadian residential and business fixed broadband Internet access service subscribers should be able to access speeds of at least 50 megabits per second (Mbps) download and 10 Mbps upload, and to subscribe to a service offering with an unlimited data allowance; and in Telecom Decision 2018-241, the Commission defined the universal service objective by establishing the broadband quality of service that should be provided to all Canadians. Specifically, the Commission determined that fixed broadband Internet access service is of high quality if it meets a round-trip latency threshold of 50 milliseconds and a packet loss threshold of 0.25%, both measured during peak times.
4	Telecom Regulatory Policy CRTC 2018-377 However, the Commission's Broadband Fund is only one part of the wider broadband Internet funding ecosystem, along with private investment from Internet service providers (ISPs) and other government funding sources. The Broadband Fund will not be a substitute for either market forces or public funding initiatives but will work in concert with them to provide Canadians with access to a world-class communication system. The Commission has taken this into account when designing many elements of the application, evaluation, and project selection processes set out in this decision.
5	CRC TECHNICAL REPORT Capability Evaluation of Fixed Wireless Access Systems to Deliver Broadband Internet Services; CRC Unique number: 031019-TR-01

Table 2: *References*

11 APPENDIX A: GOVERNMENT FUNDING PROGRAMS

This Appendix shows broadband funding programs that have been released by the Federal Government the past 5 years.

11.1 Canadian Broadband Fund

The CRTC has established the Broadband Fund, which will provide $750 million over five years. The second series of applications closed June 1, 2020.

The County would apply to support their **fixed broadband Internet access service projects**, see below. There were opportunities for funding **transport** projects to provide high speed data traffic between communities, see below.

Stimulus funding may also be available from the Provincial and Federal Government.

11.1.1 Fixed Broadband Internet Access Service Projects

The fund requires an application that is dependent on the following criteria:

1. Eligible geographic area

   The CRTC determined that to be eligible for funding for a fixed broadband Internet access service project, an applicant must propose to build or upgrade infrastructure in an eligible geographic area, defined as a 25 km2 hexagon where there is at least one household, as per Statistics Canada's latest census data, but where no household has access to broadband Internet access service at universal service objective-level download and upload speeds (i.e. 50/10 Mbps).

   An applicant must propose to build or upgrade infrastructure to an eligible community, defined as a small population centre with a population of fewer than 30,000 residents, that is located at least 2 km away from a PoP with a minimum capacity of 1 Gbps.

2. Eligible Projects:

   The CRTC determined that to be eligible for funding, proposed projects that would build or upgrade access infrastructure must be capable of providing a minimum download speed of 25 Mbps and a minimum upload speed of 5 Mbps.

   The CRTC expects that proposed projects that do not meet the universal service objective-level speeds of 50 Mbps download and 10 Mbps upload will be scalable, meaning that speeds of 50/10 Mbps will be provided to the target community at a future date through capacity upgrades in the access or transport infrastructure. The CRTC will evaluate the scalability of each proposed fixed broadband Internet access service project in the assessment stage.

3. Eligible Applicants

   The CRTC determined that to be eligible for funding, applicants must demonstrate that

   a. they are one of the following:

      i. a corporation, either for-profit or not-for-profit, incorporated under the laws of Canada, a Canadian province, or a Canadian territory;

ii. a Canadian provincial, territorial, or municipal entity, including a public-sector body that is established by statute or by regulation or that is wholly owned by a Canadian provincial, territorial, or municipal government;

iii. a band council within the meaning of section 2 of the Indian Act, or an Indigenous (First Nations, Inuit, or Métis) government as established by a self-government agreement or a comprehensive land claim agreement; and/or

iv. a partnership, joint venture, or consortium that is composed of the parties identified in (a), (b), and/or (c) above.

b. they, or at least one member of the applicant partnership, joint venture, or consortium, are eligible to operate as a Canadian carrier pursuant to section 16 of the Telecommunications Act.

c. they, or each member of the applicant partnership, joint venture, or consortium, with the exception of applicants that are members of (b) above, are financially solvent and reliable by providing independently prepared financial statements for the last three years.

d. they, or at least one member of the applicant partnership, joint venture, or consortium, have experience deploying and operating broadband infrastructure in Canada for a minimum of three years, or they have entered into a contractual arrangement with an entity as described in (a), (b), and/or (c) above that has experience deploying and operating broadband infrastructure in Canada for a minimum of three years.

4. the CRTC determined that applicants will not be required to secure a minimum level of financial support from a government entity to be eligible for funding. However, it is part of the evaluation: the CRTC considers that this kind of interaction between communities and service providers is important and can lead to better, more efficient broadband projects for Canadians. The Commission has therefore established community consultations as an eligibility criterion, as discussed in paragraphs 216 to 224 below.
5. Applicant investment be an eligibility criterion

To be eligible for funding, an applicant must demonstrate its ability to fund its own investment in the proposed project, as follows, with further details to be provided:

a. An applicant that is not a provincial, territorial, or municipal government entity is required to file independently prepared financial statements for the last three years.
b. If an applicant is a partnership, joint venture, or consortium, the applicant is required to file financial statements as set out above for each member or partner that is not a provincial, territorial, or municipal government entity.
c. An applicant relying on credit to demonstrate its ability to fund its project must provide documentation from a third-party lender or investor indicating that it has irrevocable access to the credit required to pay for the project

6. Eligible Costs:

The CRTC determined that funding will be provided only for eligible costs, which include costs that are directly associated with project activities such as engineering and design, environmental scans and assessments, as well as the purchase and installation of equipment and infrastructure (including the provisioning of backhaul capacity and other one-time access-driven costs).

7. Consumer pricing and affordability be eligibility criteria:

the Commission determined that to be eligible for funding under the Broadband Fund, applicants with proposed projects to provide fixed or mobile wireless broadband Internet access service to customers must:

a. identify a list of various broadband Internet access service packages, with rate, speed, and capacity levels that address different customer needs, including those of low-income households. These packages must include rates that are identical to or lower than those offered by a facilities-based service provider in one of the major urban centres or communities, to be identified by the Commission, in the proposed project's province or territory for reasonably comparable speed and capacity packages.

b. commit to providing broadband Internet access service packages at a rate no higher, and at a speed and with a capacity no lower, than the ones proposed in their application, for a minimum of five years from the project completion date.

11.1.2 Transport Projects

The CRTC proposed that transport projects for new builds must offer a minimum capacity of 1 Gbps, and proposed projects that would upgrade transport infrastructure must offer a minimum capacity of 10 Gbps. If a proposed transport project contains transport links to new interconnection points and transport links that upgrade existing interconnection points, each new interconnection point must meet the 1 Gbps minimum capacity requirement and each interconnection point being upgraded must meet the 10 Gbps capacity requirement.

11.1.3 Canadian Carrier Eligibility

Canadian Carrier Eligibility, from "Telecommunications Act S.C. 1993, c. 38"

(2) A Canadian Carrier is eligible to operate as a Telecommunications Common Carrier if

(a) it is an entity incorporated, organized or continued under the laws of Canada or a province and is Canadian-owned and controlled;

(b) it owns or operates only a transmission facility that is referred to in subsection (5); or

(c) it has annual revenues from the provision of telecommunications services in Canada that represent less than 10% of the total annual revenues, as determined by the Commission, from the provision of telecommunications services in Canada.

(5) Paragraph (2)(a) and subsection (4) do not apply in respect of the ownership or operation of

(a) international submarine cables;

(b) earth stations that provide telecommunications services by means of satellites; or

(c) satellites.

(6) A Canadian carrier that is eligible to operate under paragraph (2)(c) remains eligible to operate even if it has annual revenues from the provision of telecommunications services in Canada that represent 10% or more of the total annual revenues from the provision of telecommunications services in Canada as long as the increase in its annual revenues from the provision of telecommunications services in Canada to 10% or more of the total annual revenues from the provision of telecommunications services in Canada did not

result from the acquisition of control of another Canadian carrier or from the acquisition of assets used by another Canadian carrier to provide telecommunications services.

11.2 Innovation Science Economic Development (ISED) Fee Decreases

ISED intends to implement the point-to-point fee table, as outlined in reference [1], by April 1, 2021. This will reduce the costs for ISPs to deploy last mile. Table 4 shows the fee table.

The location of the fixed point-to-point link station will determine the base rate used to calculate the licence fees. Urban, rural and remote areas align with Tier 5 service areas. Urban areas will comprise of all metropolitan and urban Tier 5 service areas, rural areas will comprise all rural Tier 5 service areas and remote areas will comprise all remote Tier 5 service areas. County is considered a rural area as shown in Figure 18.

Table A1 — Frequency ranges and base rates for fixed point-to-point links

Frequency range	Urban base rate ($/MHz)	Rural base rate ($/MHz)	Remote base rate ($/MHz)
≤ 890 MHz	2,750	2,200	1,375
> 890 and ≤ 960 MHz	138	110.40	69.00
> 960 and ≤ 4200 MHz	45	36.00	22.50
> 4.2 and ≤ 8.5 GHz	34	27.20	17.00
> 8.5 and ≤ 15.35 GHz	24	19.20	12.00
> 15.35 and ≤ 24.25 GHz	16	12.80	8.00
> 24.25 and ≤ 52.6 GHz	10	8.00	5.00
> 52.6 and ≤ 92 GHz	0.50	0.40	0.25
> 92	0.50	0.40	0.25

Table 4: Fee Table Proposed in Reference 1

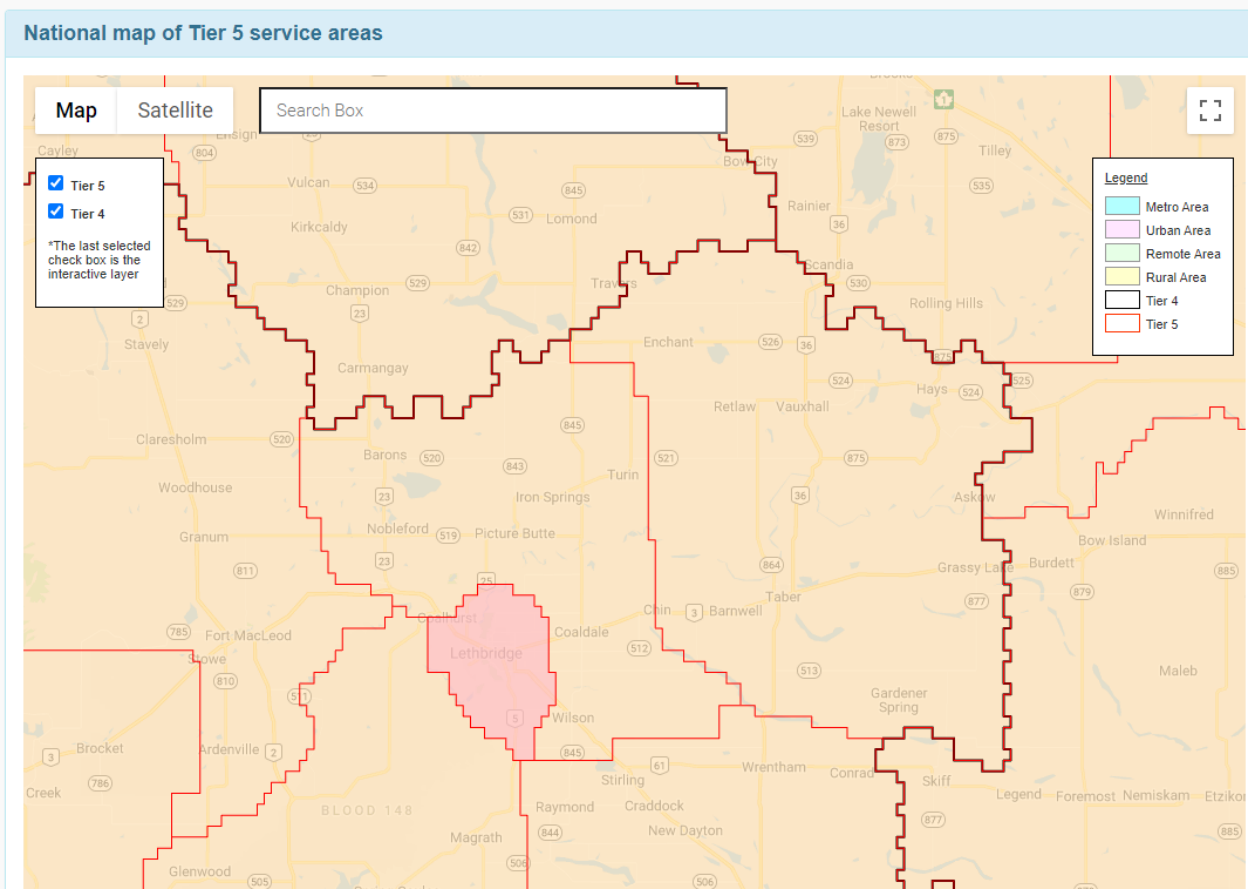


Figure 18: Rural Tier 5 Service Areas around County of Forty Mile

11.3 Universal Broadband Fund (UBF)

The UBF is a $1.7B fund announced in November 2020. The UBF contains the Rapid Response Stream and the main Universal Broadband Fund program. Differences between the Rapid Response and the main Universal Broadband Fund are described below:

Project Timelines: While both programs aimed for rapid broadband deployment, the most important difference remains the timelines of the projects. Projects under the Rapid Response Stream were intended to be deployed as quickly as possible and must be completed by November 15, 2021, whereas projects under the main Universal Broadband Fund had until March 31, 2027 to be completed.

Funding Contribution: The maximum funding contribution under the Rapid Response Stream is $5,000,000, but there were no similar caps under the main Universal Broadband Fund.

Eligible Costs: Any technology that can be used to improve household Internet connectivity is eligible under both the main Universal Broadband Fund and the Rapid Response Stream. Customer premise equipment can be considered as an eligible cost under the Rapid Response Stream, if it is required to make the access available. All other eligible costs are the same for the Rapid Response Stream and the main Universal Broadband Fund.

11.4 Connect to Innovate (CTI) Project Funding

From reference [2], the Government of Canada's $500 million Connect to Innovate program is investing in building the digital backbone of high-speed Internet networks. Backbone networks are the digital highways that move data in and out of communities. These highways carry large amounts of data that are essential for schools, hospitals, libraries and businesses to function in a digital world.