County of Minburn Broadband Strategy

Version	Revision Date	Author	Reviewer	Details
1	June 7th, 2022	MS BS	MS	Reviewed by Davin G on June 9 with comments
2	June 15, 2022	MS BS RE	BS	Reviewed Davin's comments, updated coverage predictions

Contents

1 Definitions

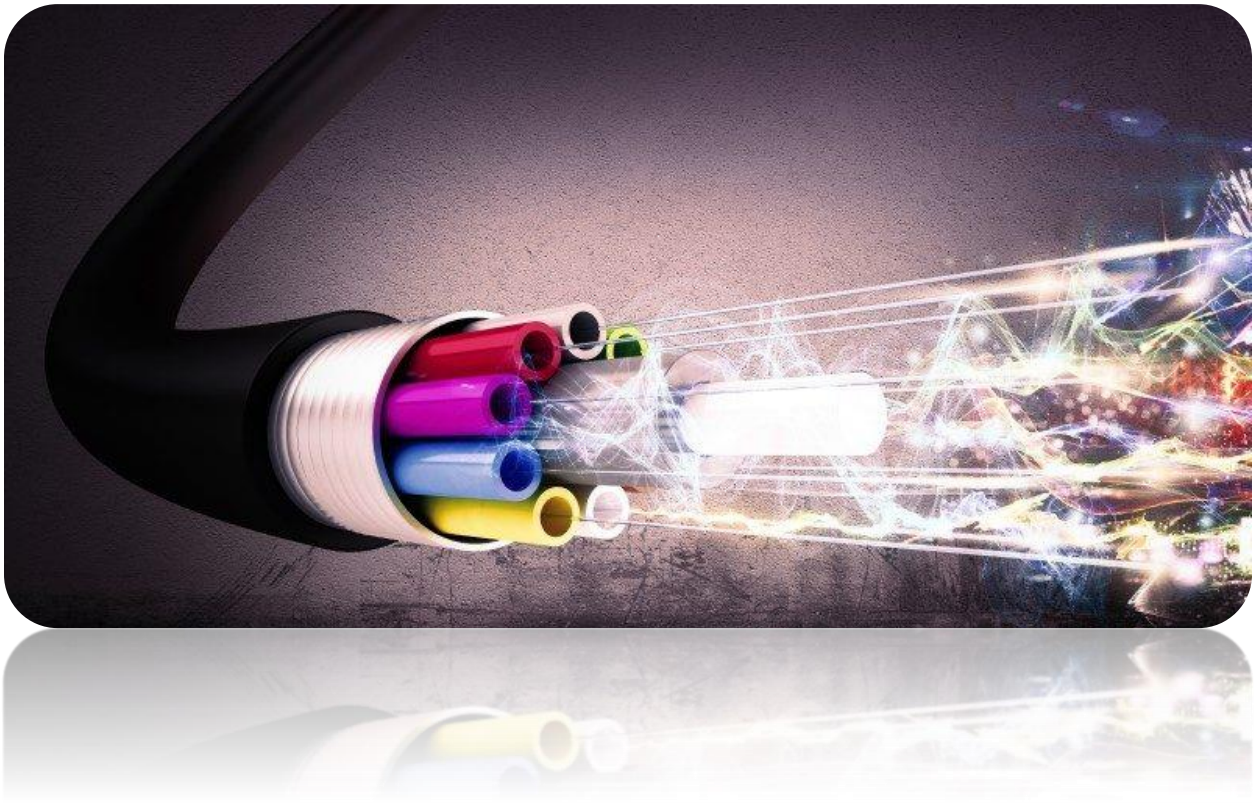
Term	Definition
AVL	Automatic Vehicle Location
Broadband	Wide bandwidth data transmission which transports multiple signals and traffic types, including internet. The medium can be coaxial cable, optical fiber, radio or twisted pair.
Canadian Carrier	means a telecommunications common carrier that is subject to the legislative authority of Parliament; (entreprise canadienne)
CRTC	Canadian Radio-television and Telecommunications Commission
ISED	Innovation, Science, and Economic Development
ISP	"Internet Service Provider" means an organization that provides services accessing and using the Internet.
LEO	Low Earth Orbit Satellite
Mbps	"Megabits per Second" means a unit of measurement for bandwidth and throughput on a network. Each megabit is equal to 1 million bits.
OAN	"Open-Access Network" means a telecommunications network architecture and business model that separates physical access to the network from delivery of services. In an OAN, the owner of the network does not supply services; these services are supplied by separate retail service providers or ISPs. OAN can include physical towers, physical network equipment such as fibre or radios, or simply conduit that is large enough to support multiple providers access.
PTP	Point to Point
Qualified ISP	An ISP that meets County of Minburn's standards set for service quality and security.
Respondent	One who responded to the RFEOI for County of Minburn Broadband Data
RFEOI	Request for Expression of Interest
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 télécommunication)
The County	County of Minburn
VSAT	Very Small Aperture Terminal

Table 1: Definitions

2 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
4	Telecom Regulatory Policy CRTC 2018-377
5	Table of Key Dates - Policy and Licensing Framework for Spectrum in the 3500 MHz Band
6	Fibre Reference Guide, Ministry of Transportation and Infrastructure First Edition January 2019

Table 2: References



3 Summary

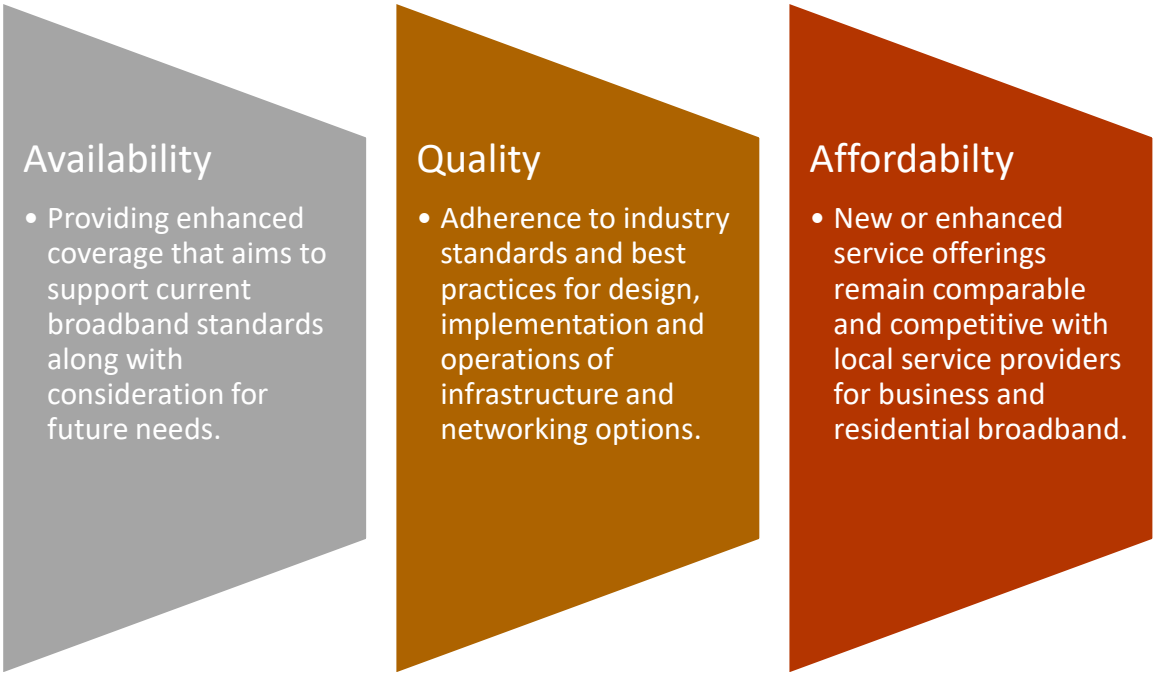
A vast majority of County of Minburn rural residents and businesses are underserved by current Internet services that are available in relation to the Canadian Radio- Television and Telecommunications' (CRTC) basic standards for broadband connectivity.

The County of Minburn must take into consideration several activities that are listed in Table 3 in-order-to keep the County, industry, and ISP's both informed and motivated to maintain industry standards and continue growth related to supporting our communities.

County investment in broadband connectivity should support municipal priorities while supporting Open Access Networks. Investment in broadband development should look to grant funding and partnerships as a priority.

4 Objectives

This strategy describes future networks and procedures that will encourage partnerships to provide broadband for County residences and businesses. These networks and procedures meet the following purposes:



The specific objectives of this strategy are as follows:

1. Partnerships with business, ISP, and other municipalities to increase the Availability of Broadband in the County; reference section 8.5.

2. Identify permit process changes and policies that may be implemented by the municipality to extend broadband.
3. Prepare the municipality for greater development of open-access broadband infrastructure.

5 Strategy Implementation

The successful implementation of the strategy relies on the joint effort of many stakeholders. The following table summarizes the recommended actions contained within this strategy, along with key departments and external stakeholders.

Timeframe: Ongoing (currently underway), Immediate (1 to 2 years), Future (3 to 5 years)

No.	**Details**	**Stakeholders** (County IT, County Planning, County CAO, Business Partners, ISPs, GOA, and/or Federal)	**Timeframe**	**Addressed Purposes**	**Required Resources** (Low, Medium, or High)
1	Review Broadband Policy	County CAO County Planning	Immediate and ongoing	All	Low *This was already done in 2022.*
2	Review development approval processes and approval conditions to support deployment of broadband through new developments	County Planning County CAO	Immediate	All	Low
3	Support future grant funding applications through endorsements (No Monetary Value)	County CAO ISPs	Immediate and ongoing	All	Medium *Expect this to occur 2022Q4*

4	Conduct service availability surveys for residences and businesses	County Planning	Immediate and ongoing	Partnerships Availability	Low *Minburn has already developed a speedtest page and broadband webpage*
5	Develop a communication approach that provides regular updates/meetings with internet service providers to communicate growth areas, infrastructure planning, and utility projects, as well as providing information on broadband service needs and gaps.	County Planning County CAO ISPs	Immediate and ongoing	Partnerships Availability	
6	Develop an advocacy approach to provincial and federal levels of government on the importance of the availability and affordability of adequate broadband services.	County Planning County CAO GOA Federal	Future	Partnerships Availability Affordability	Medium *Council involvement has been engaged.*
7	Maintain a broadband specific web page on the County website	County Planning	Immediate and ongoing	Partnerships	Maintaining *This has already been completed*
8	Compile a list of business and residential needs-by-phase and prepare business cases	County Planning County CAO Business Partners ISPs	Immediate	Partnerships Affordability	Medium
9	Coordinate and communicate broadband policies, strategies and	County Planning County CAO	Immediate	All	Low

	initiatives with other municipalities				
10	Investigate the feasibility of a Dig Once Policy.	County Planning County IT County CAO GOA Business Partners	Immediate	All	High
11	Deployment of Open Access Network Infrastructure	County Planning County IT County CAO ISPs Business Partners	Immediate and Future	All	Medium to High
12	Develop a collocate process or program to allow ISPs access to towers	County Planning County CAO	Immediate	Partnerships Affordability	Low

Table 3: Strategy Actions

6 The Importance of Broadband

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.
    - Examples include grain elevators, where many utilize off-site servers, telephone systems, and video conferencing in their day-to-day operations.
    - This market 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 consider all locations in the County for their homes.
    - 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 for 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.

7 Current State

There are a limited number of ISPs that provide rural broadband in the County.

Most of the County of Minburn does not meet the minimum standards of 50 Mbps down, 10 Mbps up; reference Figure 1. There are also limited fibre points of presence, leaving whole communities without access to high-speed corridors.

There is at least one ISP (MCSnet) in the County that has submitted applications for County-wide improvements to broadband to meet the minimum high-speed service levels. The submitted applications are in alignment with the County Policy of Open Access Networks and expanding the use of fibre.

The definitions of high-speed grow at a rate of 10x the speed every 5 years: in 2011, it was 5/1 Mbps in 2011 (CRTC Policy 2011-291-1), and 50/10 Mbps in 2016 (CRTC 2016-496). Already there is increasing pressure to again raise high-speed data rates given the emergence of at-home video conferencing, increasing at-home data-usage, and changing traffic patterns caused by at-home work. Already data plans in larger communities within Minburn offer 300Mbps to residences while those in rural County areas struggle to achieve the minimum 50/10Mbps benchmark.

Most of the rural broadband coverage in the County is, and will most likely continue to be, from Wireless ISPs especially TELUS. LEO Satellite services are expected to serve an increasing number of residences over the next 5 years. It is unexpected that fibre will be placed to rural residences in any quantity over the next 5 years except for unique situations of high density that a specific case for development is presented.

7.1 State of Wireless ISPs

Wireless ISPs today have sufficient towers to blanket Minburn County with coverage, as shown in Figure 3. They also stated they provide wireless rural wireless coverage for most of the County at 25/5Mbps, as shown in Figure 2. This is not the experience of Minburn ratepayers, especially away from the population centers; survey results are shown in Table 4 and Figure 1, which is much less than 50/10 Mbps.

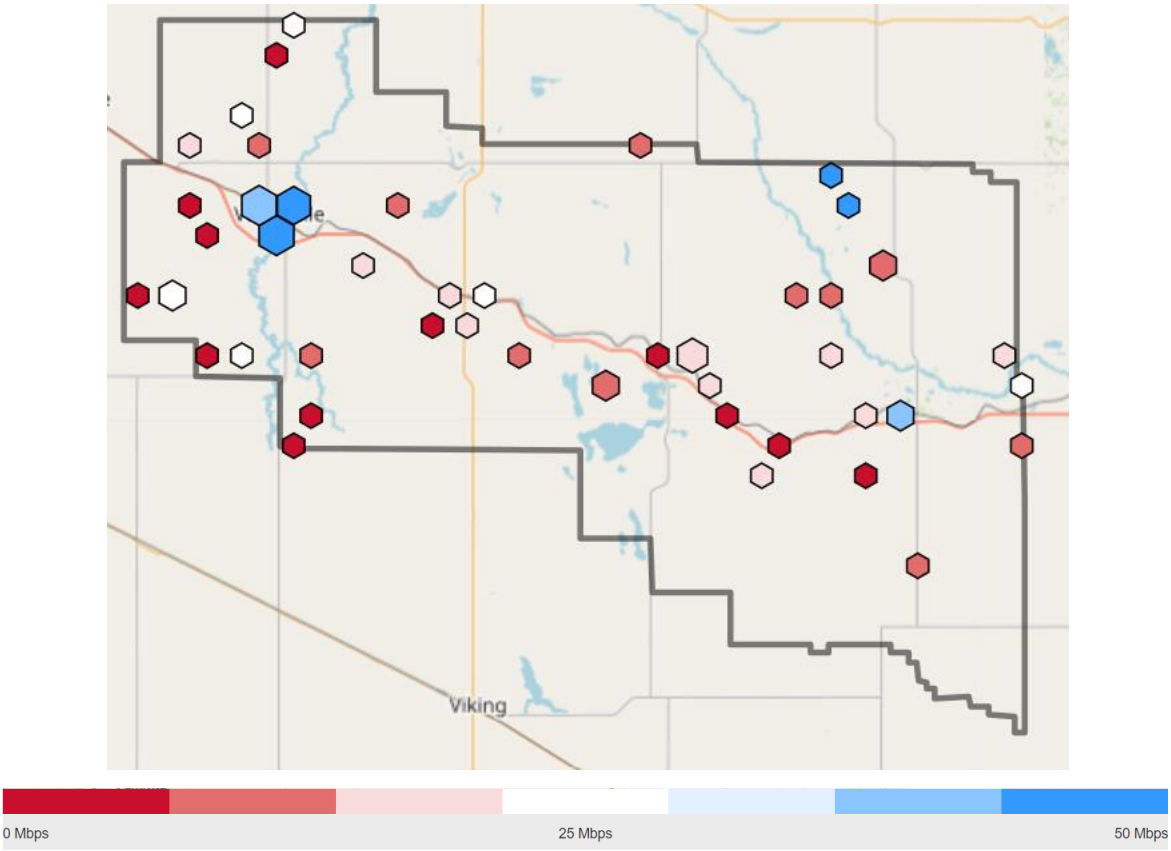
Reasons why ISPs can't provide minimum internet, even when they should have sufficient coverage:

- Heavy internet traffic on a particular ISP wireless site
- Number of multi-point connections to the fixed wireless site
- Distance of the home to the fixed wireless site
- The time it takes for data to travel to and from their destination (e.g. latency)
- The amount of data packets that travel from their destination but fail to reach your home (e.g. packet loss)

The Wireless ISPs will need the following upgrades to their networks:

- Increased backhaul data to the fixed wireless site and Increased access to data off high-speed data corridors, **i.e. add fibre backhaul**
- Reconfigure antennas to focus coverage
- Additional last-mile sites closer to users; this can still help, but has diminishing returns for the ISP due to the high capital cost, if not shared.

Large carrier ISPs, such as TELUS, are in-process of offering 25/5 Mbps to the County. It is expected they will further improve this service over the next 5 years regardless of what the County does.



245 Tests Run in Minburn County

Figure 1: Speed Tests Completed in Minburn 2022 06 14

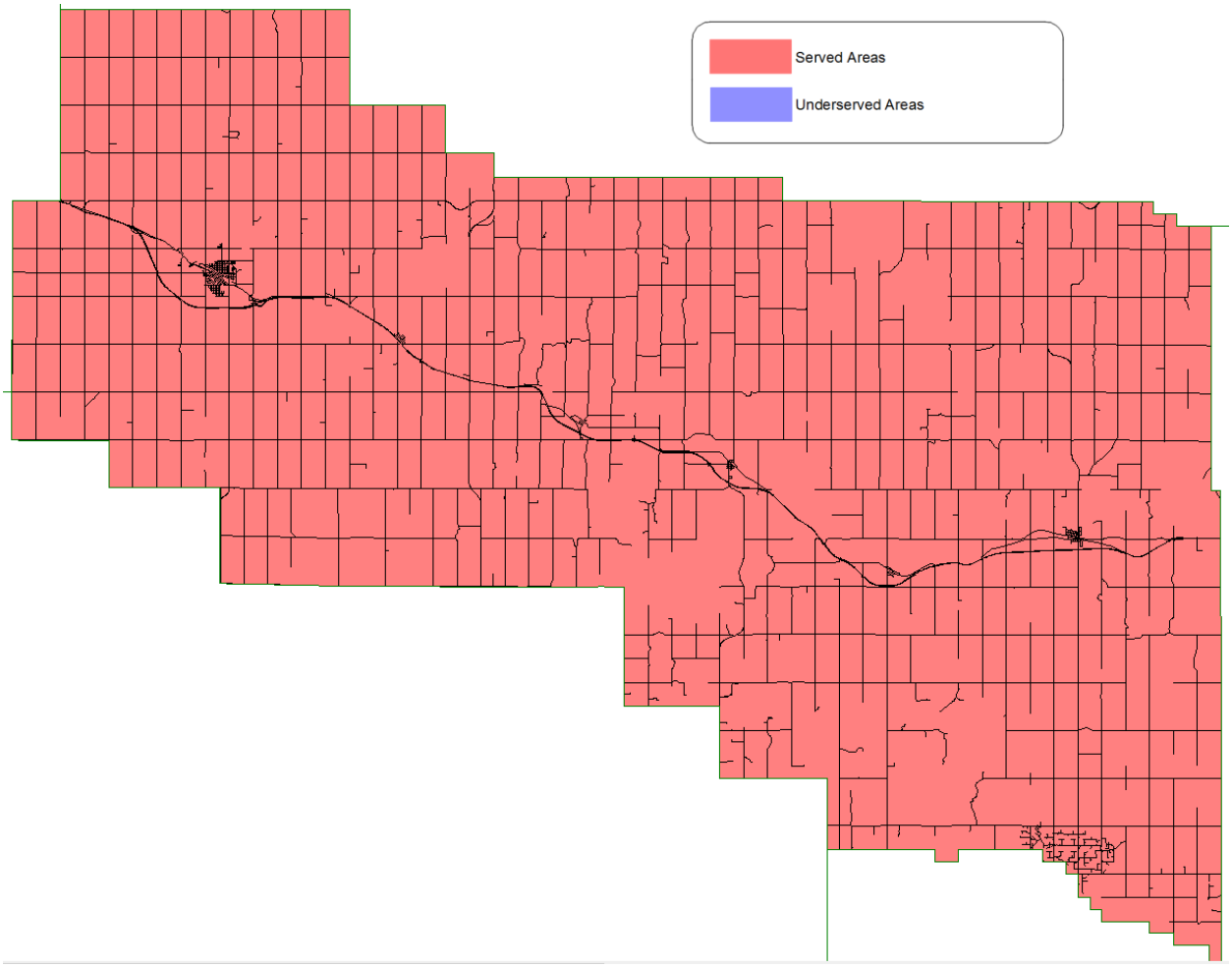


Figure 2: Canadian Broadband 25 Mbps Down, 5 Mbps Up

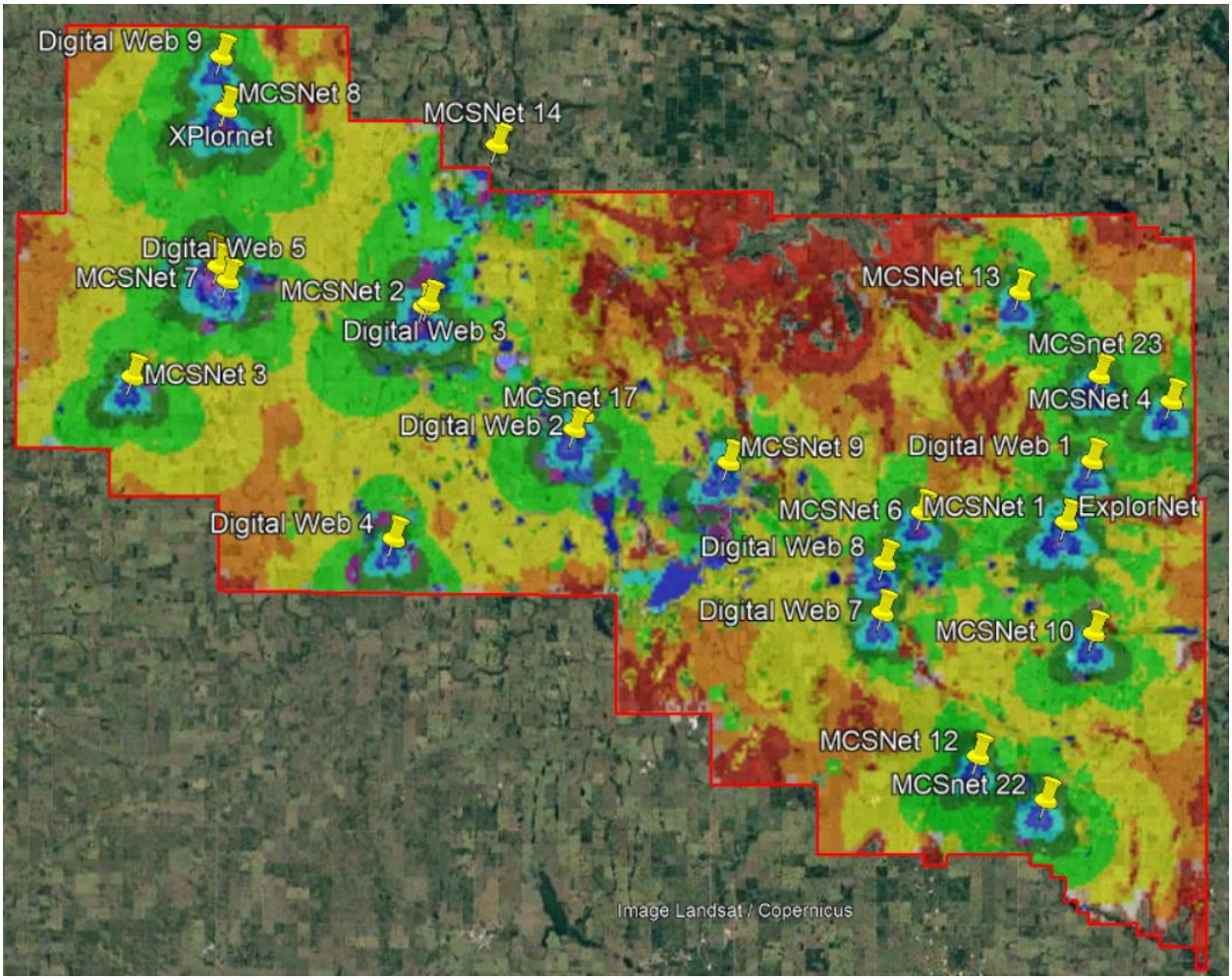


Figure 3: County of Minburn 50Mbps Forecasted Coverage from known ISPs as of 2022 06 14

7.2 State of Wireline Connections ISPs

Two municipalities within the County of Minburn have ISPs offering data rates using wireline delivery, much greater than 50/10Mbps. These municipalities are Vegreville, and Mannville. Vegreville has TELUS fibre and recently MCSNet brought fiber to Mannville

High speed corridors provide backhaul for ISPs. High speed corridors are provided by TELUS, AXIA, and Shaw. These corridors provide demarcations in Vegreville, Innisfree, and Mannville.

8 Improving Connectivity in Underserved Areas

8.1 Develop an Open Access Network

An Open Access Network provides access for institutions, residences and business throughout the County to ISPs that serve larger communities. Agreements with abutting municipalities and their OANs

will allow connection to other open access networks and eventual greater choice of ISPs. Greater choice allows for increased competition and a combination of better quality and more affordable internet.

Fibre Connected to Wireless ISP sites, closer to Industrial Parks, or closer to Hamlets	
Quality	Removes unlicensed links and improve coverage. Improve backhaul data-rates
Availability	Provide greater accessibility to ISPs Fibre is the only technology considered future proof providing pay-back over the long-term
Affordable	Lower ISP data warehousing and support costs. These savings could be passed to their customers Allows greater competition from ISPs Will allow data rates to scale with minimal investment over-decades

Table 1: Open Access infrastructure

The Open Access Network connects the following broadband priorities:

1. Wireless Rural Broadband Providers by increasing fibre to ISP Wireless towers; the towers would be selected in discussion with ISPs based on their ability to increase Broadband availability
2. Fibre to commercial area south of Vegreville (Hwy 16 & 857 intersection)
3. Fibre to West Industrial Park
4. Fibre to Hwy 16 & 36 Crossroads industrial park
5. Fibre to East Industrial Park
6. All the hamlets

The Open Access Network extends a fibre backhaul to ISP towers, into communities, and near strategic priorities (eg. Future commercial/industrial areas). The ISPs, communities, and strategic priority partners must be engaged to complete the last mile to ratepayers' dwelling and businesses. A list of what is needed for the last mile is as follows:

- ISP Towers: Fibre cable from OAN pedestal to their ISP site
- Communities: Fibre from pedestal to the home or fibre to a 5G access-point to the home
- Strategic Priorities: Fibre from the pedestal to the business or fibre to a 5G access-point to the business.

Open Access fibre is a 30 – 50 year investment and is the only technology proven to keep pace to ever increasing data demands. From reference [4], fibre is "Future-proof – speeds of fibre connections are limited by the electronics attached to the end of the fibre optic cables, not by the network infrastructure itself."

The OAN, priced by phase is shown in Figure 4. There is a fibre optic splice closure (FOSC) placed every 4km in this design.

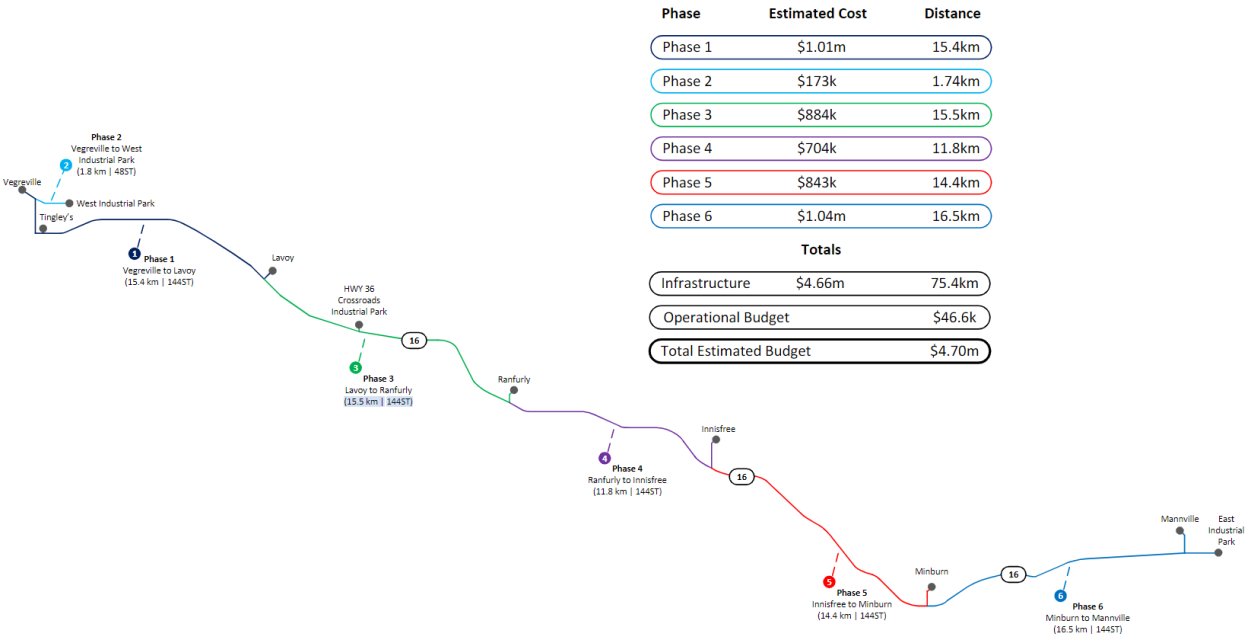


Figure 4: County of Minburn Open Access Network

The OAN is intended to connect to the ISPs that are present in Vegreville and Mannville; Vegreville has the most-dense areas of ISPs and fibre-connected ISPs in the County.

The OAN also has the potential to leverage several fibre-connected ISPs (TELUS, Shaw, Axia) and gain access to dozens of ISPs that are on-premise in Edmonton data centres (Whipcord, Data Hive, and others). Achieving connectivity would be best completed by connecting to adjacent municipal OANs; alternatively, a 10GBPS connection can be rented from a data wholesaler.

Design and construction of any phase of the OAN should coincide with grant funds, public/private investment and partnerships to support any infrastructure capital purchasing as well as ongoing operating and replacement costs.

8.2 Development/Subdivision Policy

The policy should require consideration for broadband when new developments are proposed, see Table 2. These requirements promote fibre to the home or business

Requirement	**Type of Development**
Conduit placed for Fibre	Acreage residential/multi-lot subdivision or business sub-division
Right of way allocated either on power poles or in an easement. Poles should be designed to hold FOSCs	Acreage residential/multi-lot subdivision, commercial or industrial district, or new business park

and fibre lines when installed. Poles should also be designed to hold 5G antenna.	
Subdivision point of access. This location would allow transport fibre to serve on demarcation	Acreage residential/multi-lot subdivision, commercial district, or new business park
Subdivision easement for a 5G tower.	Acreage residential/multi-lot subdivision, commercial district, or new business park

Table 2: Development Permit Broadband Requirements

Estimated pricing for placing and sourcing broadband infrastructure are shown in Table 3. To note, these prices are typical for March 2021; the items have been selected that pertain to residential and business developments. The pricing also reflects carrier-grade installations.

Detail	**Price**
32mm Conduit	$2.5/metre
48f cable	$2.7/metre
Fiberglass Communications Vaults - 24x36x24"	$540/vault
Design	$3.3/metre
Plow	$10 - 15 /metre
Directional Drill	$26 – 55/metre
48f vault splice (ribbon)	$880 - 960/vault

Table 3: Fibre Infrastructure Costs

The broadband permitting requirements would impact work from developers, governments, and utilities.

8.3 Dig Once Policy

Considering that Alberta Transportation right of ways are used for pipelines, roadways, and other infrastructure builds, this policy will gain most value if also adopted at the Provincial Level.

This policy would install a communications conduit, duct, pedestals and/or vaults along with other utility upgrades when the Government of Alberta and/or County construct/upgrades a road. This policy has many advantages, including cost saving and minimization of impact to roadways.

There will need to be cooperation from Planning and Engineering Departments to ensure proper implementation through advocating and planning. The Planning and Engineering Department should be notified of projects and review designs to take advantage of opportunities. With their assistance, a fibre network will be built in a fraction of the normal time and cost.

Considering that many of these upgrades coincide with placing a roadway, limiting how often trenching occurs on the roadway saves money and preserves the integrity of the road. It is approximately 10 times more expensive to add infrastructure after installation has occurred; see reference 11.

8.4 Leverage Grant Funding

When supporting grant funding submissions for new fibre, the County should state their support of open access fibre connections. They should also push to reserve at least 6 strands of open-access fibre at every POP location.

When supporting grant funding submissions from wireless ISPs, the County should state minimum acceptable design guidance for the ISP, which includes:

1. 8:1 ratio of subscriber to high-speed last-mile hub-site
2. Tower infrastructure should be CSA compliant and capable of supporting at least two ISPs

These guidelines should be reviewed and revised at the start of each grant funding cycle.

8.5 Pursue Private-Public Partnerships

Private public partnerships present unique opportunities to address a small area through a request for service proposal. Areas within the municipality that are identified to have limited speeds and or service options can be approached using this private public approach to site specific broadband development.

The top public-private partnership opportunities in 2022:

3. MCSnet has already submitted grant applications and presented their fibre installation strategy. Their strategy shows significant alignment with Minburn's OAN strategy and MCSnet indicated they would like to pursue partnering opportunities.

The recommended process to engage MCSnet is as follows:

1. Send Request for Information to ISPs
2. Develop OAN proposal for fibre from POP locations in partnership with an ISP
3. Survey municipality, industrial park owner, existing businesses, and developers of new business parks (the Stakeholders) to gauge their level of interest in the OAN proposal.
4. Develop and present business case to ISPs, County and Stakeholders.
5. Discuss and agree on business case, prepare agreements and proceed to project execution