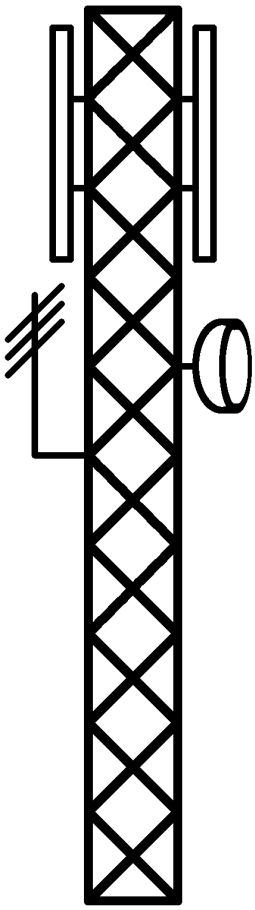


Saddle Hills County
Broadband Strategy
2020—2024

Adopted 2020-04-14
Motion 235-04-14-20

Growing with Change

Mail RR1 Spirit River, Alberta,T0H 3G0 | **Tel** 780-864-3760 | **Fax** 780-864-3904 | **Web** www.saddlehills.ab.ca

Contents

TABLE OF CONTENTS

INTRODUCTION

The global demand for broadband services continues to increase, and the residents and businesses of Saddle Hills County are no different. Mobile devices, homes, businesses, farms, schools and industry infrastructure are all increasingly reliant on broadband as their functional backbone. As such, broadband is no longer a luxury, it is a necessity.

Saddle Hills County has recognized the importance of broadband and has taken steps to ensure that these services become more readily available within the County. Through this Broadband Strategy, Council confirms their ongoing commitment towards the goals outlined within their Updated Strategic Plan :2019-2021

Within the Updated Strategic Plan, broadband has been identified as Council's third overall priority, following roads and potable water.

"*We strive to provide communication opportunities through our Utility Communications Network, which can provide a range of third party services (e.g. rural internet, improved cell coverage, etc.) for businesses and homes within the County.*"

The development of a Broadband Strategy has been identified as a step towards accomplishing this objective. As the need for broadband services continues to increase, the Broadband Strategy is intended to be updated to adapt to the inevitable technology advancements.

History

HISTORY

Saddle Hills County first recognized the importance of high-speed internet for County residents and businesses as early as 2005. A commitment was made to work with service providers to help them accomplish the provision of this important service. Although internet services improved in some areas, many residents/businesses still lacked any reliable options.

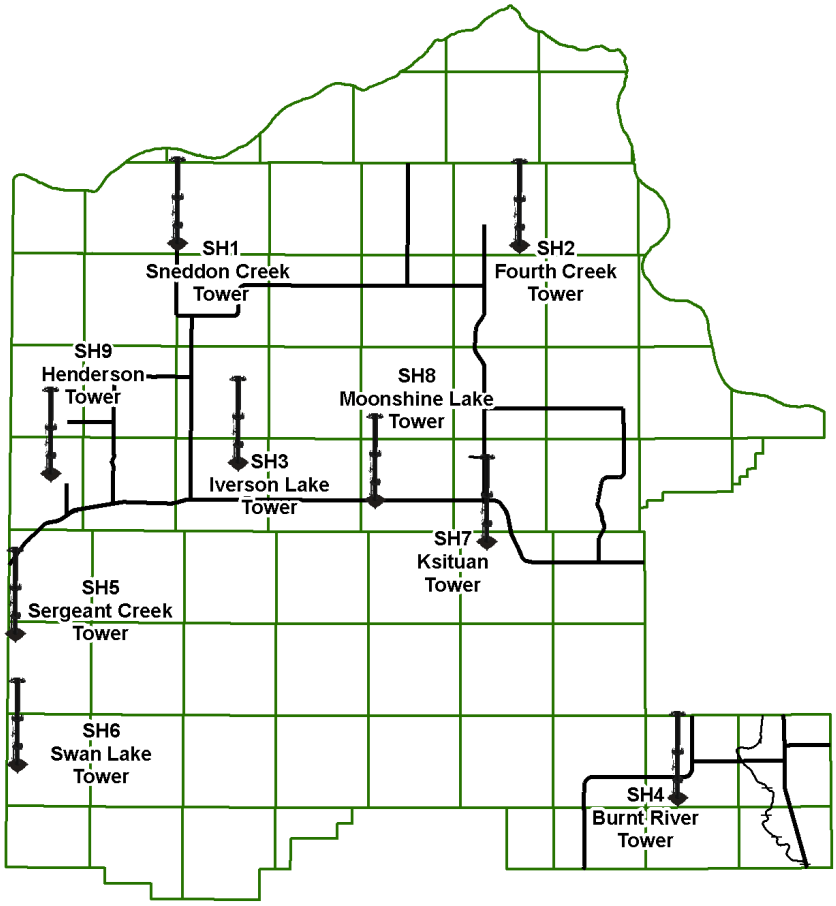
In 2012, the County conducted a Rural Communications Study that included an analysis of broadband, mobility and fire communications coverage within the County. It was identified that high-speed internet coverage was not the only important consideration. Mobility services as well as the capacity of internet and mobility services were equally relevant factors.

Several rural communications strategy options were identified in the study, for which Council selected the Utility Communications Network (UCN) strategy. The County recognized that broadband communications is a 'utility' and becomes a critical component of the County's infrastructure. The UCN model is where the County provides the necessary infrastructure so that wireless service providers can access it and enable them to provide affordable services to households and businesses in the County.

UTILITY COMMUNICATIONS NETWORK (UCN)

The Utility Communications Network was constructed in 2014-2015. It consists of nine utility-grade CSA communications towers, equipment shelters, licensed radio frequencies to provide backhaul throughout the network, and connections to multiple internet bandwidth sources.

The Utility Communication Network was designed to host a multitude of different tenants, including: Wireless Internet Service Providers (WISPs), Mobility, Private Enterprise, SHC Radio equipment and many others. The network is currently interconnected using licensed 11Ghz and 18Ghz radio links, which currently meet the capacity demand of the tenants on the towers. County equipment installed at both the Bonanza and Woking SuperNet facilities allows UCN tenants to source SuperNet bandwidth. Tenants also have the opportunity to source TELUS internet bandwidth from the Ksituan Tower.



Tower Build

UCN TENANT ACTIVITY

Shortly following the commissioning of the UCN infrastructure, the County began marketing for tenants to provide these critical wireless services.

In 2016, wireless internet service providers (WISPs) were invited to submit high-speed internet proposals under a County grant program. Peace Region Internet Society (PRiS) was the successful proponent and they were able to place their equipment on all 9 towers. Soon after they began providing services to areas where solutions were either limited or no other options were available.

Since then tenant activity continued to increase in these areas:

- private industry is providing business connectivity
- oil and gas tenants have direct links to their facilities
- a second WISP is providing residential services
- a mobility tenant is providing cell services from several towers

In 2020, the County's radio communications system will be updated (i.e. County operations and fire services). Equipment will be installed on five of the County's towers (as well as on other privately-owned towers), to provide excellent radio coverage across the County.

UCN FEEDBACK

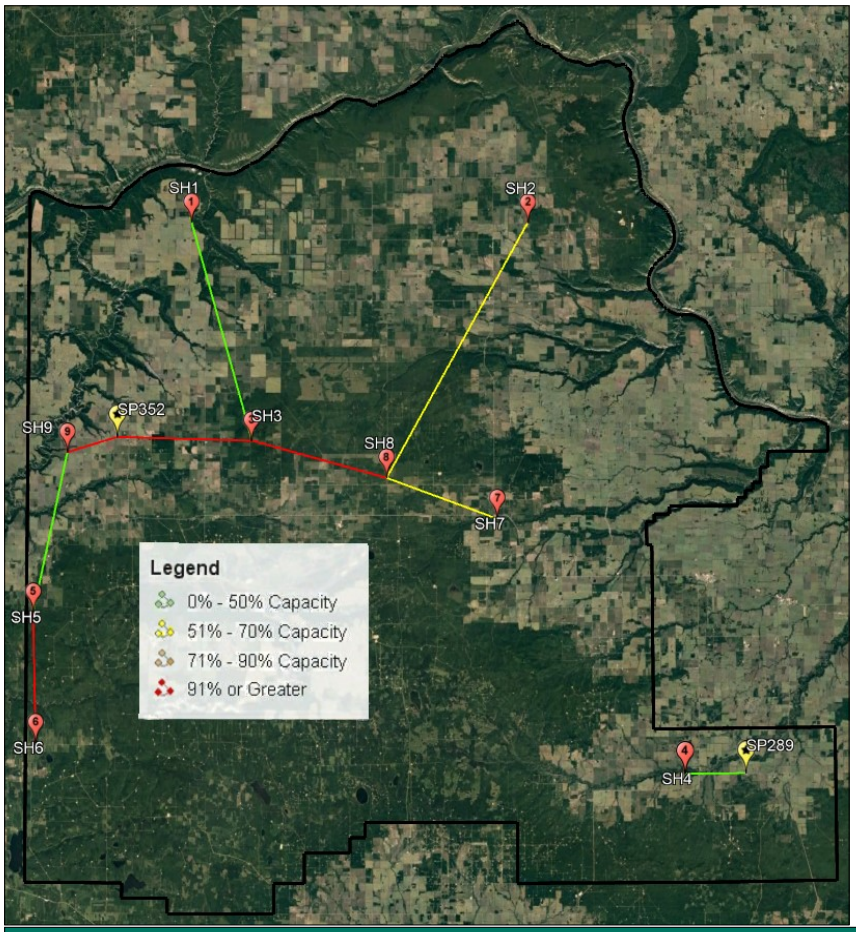
2018 and 2019 have been active years for co-location on the UCN. Feedback has been overwhelmingly positive.

- Reduced operating costs for WISPS.
- Greatly reduced investment costs for industry connectivity.
- UCN Network stability gives tenants confidence in developing their business.

A common question arose:

"How much will it cost me to upgrade to 60Mb/s?"

With tenant growth continuing at a steady pace, the County needs to consider the limitations concerning backhaul, i.e. capacity enters the picture.



The wireless links between towers have an operating cost linked to capacity. There's also a ceiling as to how much bandwidth can be supplied with the current equipment and licenses.

Eventually, in order to meet the demand for increased bandwidth capacity, fibre to strategic locations within the network will be the logical solution.

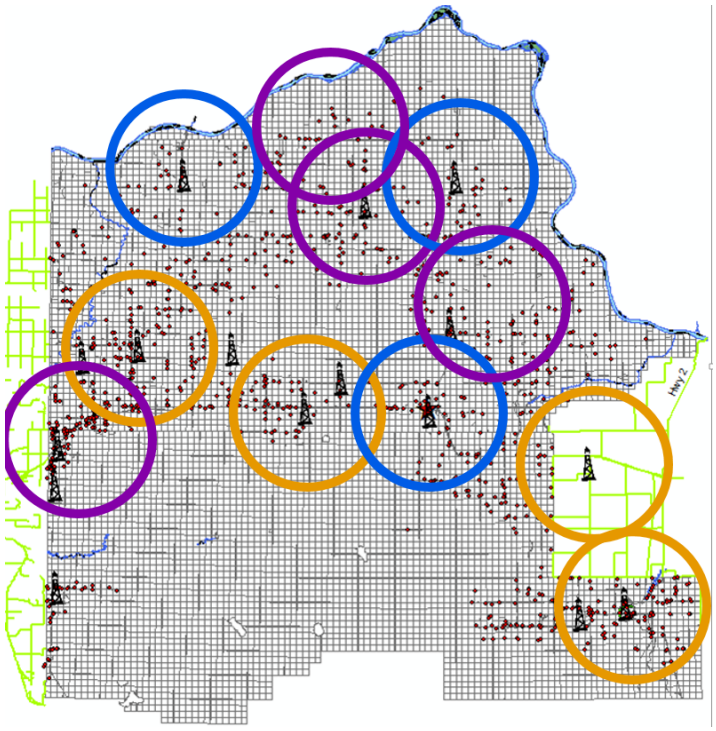
MOBILITY PARTNERSHIPS

The County's broadband initiatives have reached beyond the utilization of the UCN infrastructure for WISPs. Also in 2016, the County invited mobility providers to respond to a request to provide mobility solutions for the County. TELUS expressed an interest and that was the beginning of a partnership with the County that has resulted in enhanced services in many areas.

- 2017 The TELUS Saddle Hills County Tower (east of Savanna School)
- 2018 TELUS placed their equipment (i.e. co-located) on two of the County's towers; Fourth Creek and Ksituan
- 2019 TELUS co-located on the County's Sneddon Creek Tower.
- 2019 TELUS began planning for two new partnership towers, one in Bay Tree and the other in Blueberry Mountain. They will be completed in 2020.
- 2020 Another TELUS partnership tower will be constructed in the north central area of the County (Silver Valley Tower).

The equipment TELUS deployed at each of these sites supports both mobility and Rural Smart Hub connectivity, solving several critical challenges simultaneously.

TELUS Base Coverage
4 TELUS Towers
TELUS Partnership 2017
Saddle Hills County Tower
TELUS-SHC 2018
2 Co-locations—Fourth Creek & Ksituan
TELUS-SHC 2019
1 Co-location—Sneddon Creek
TELUS-SHC 3 New Builds
Bay Tree, Blueberry 2019-20
Silver Valley Tower—2020



BROADBAND DEFINED

Before answering the question of why broadband is necessary, it becomes necessary to define *broadband*. The term can take many meanings, however for the purpose of this Broadband Strategy, the following definition will apply:

Definition of Broadband:

For the purposes of the Saddle Hills County Broadband Strategy, the term 'broadband' refers to a high capacity data transmission system that can carry large amounts of data at once using one or more of the following technologies:

Fibre Optic

Wireless (Internet, Mobility)

Wireless internet may include any current and upcoming technology that delivers a quality service that is able to provide acceptable speeds, capacity, latency *(how long it takes data to travel between its source and destination)* and scalability *(the ability to grow as bandwidth needs increase)*.

At some point, if satellite services become readily available in the County to an acceptable standard, it may be considered to be included within the broadband definition. However, it is unlikely that the County will have the ability to have meaningful impact on the provision of satellite internet services. In other words, satellite services may impact the County's Broadband Strategy Action Plan, without satellite partnership initiatives being included in the action plan.

PURPOSE OF BROADBAND

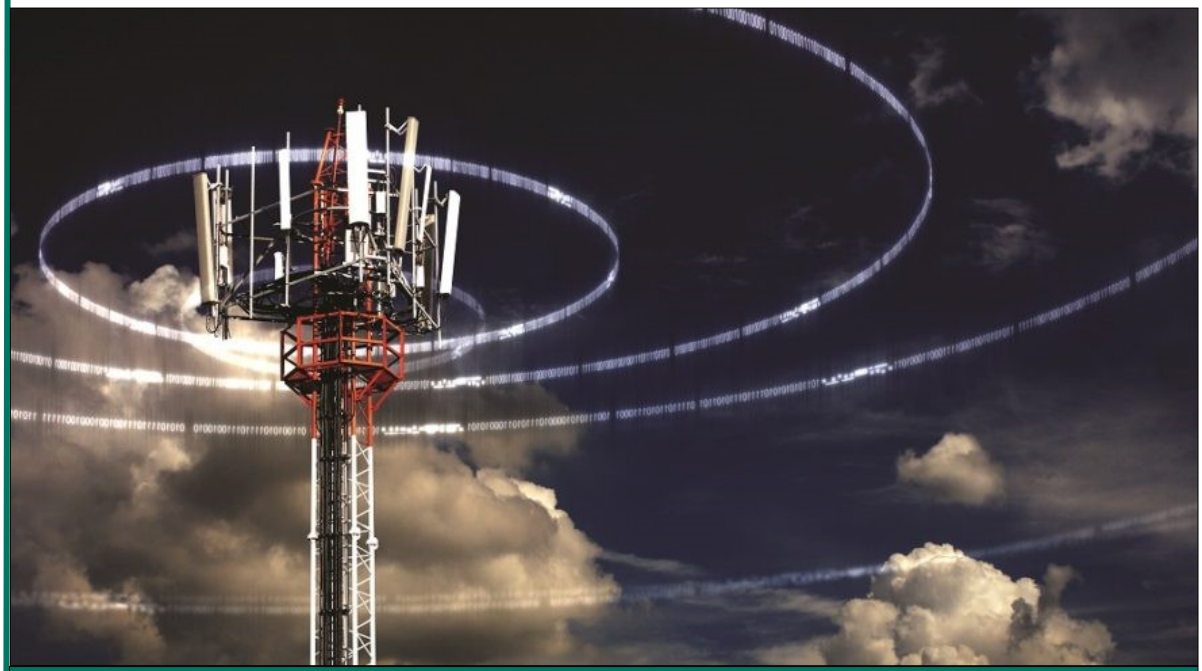
The County understands the purpose and benefits of broadband services, including:

1. Quality of life
2. Economic Development—residential/business
3. Education
4. Health
5. Emerging Technologies
6. 5G mobility readiness (preparation for additional bandwidth needs)
7. Municipal Facility Connectivity
8. Public Safety

GOALS

The County's Broadband Strategy goals will focus on achieving the following:

1. Quality high-speed internet for homes *and* business, via:
    a) WISPs
    b) Mobility (designed mainly for residential services)
    c) Wireless Integrators (who provide direct internet to business)
2. Quality mobility services throughout the County, for:
    a) Reliable cellular service for phone calls
    b) Wireless home telephone services (replacing land lines)
    c) Mobile device connectivity (e-mail, web browsing, texting, etc.)
    d) Growing technology (e.g. precision agriculture, home security systems)
3. Keeping up with capacity growth rates.
4. Wherever possible/practical, the County will strive to have only one wireless link between towers to connect to an internet source in order to provide capacity and scalability.



DRIVING FACTORS

There are many current and upcoming technologies that greatly affect the demand for broadband within the County; referred to here as Driving Factors. A summary of the current driving factors influencing this strategy are as follows:

Saddle Hills County, as well as the Provincial and Federal Governments have all identified that access to broadband is not a luxury, but an essential service. The *High-Speed Access for All: Canada's Connectivity Strategy* aims to deliver 50 Mbps download and 10Mbps upload speeds to 90% of Canadians by 2020, 95% of Canadians by 2026, and the hardest-to-reach Canadians by 2030. Their strategy includes having enhanced mobile connectivity on highways and major roads.

Homes, farms and businesses need broadband to grow and thrive. Children need broadband to interface with current education programs. Emergency services need broadband to enhance and support their lifesaving operations.

Through the previous implementation of the Utility Communications Network (UCN), as well as the current and future TELUS partnerships, the County continues to keep broadband access in focus, as it is a key to economic development within the County. Providing capacity for these networks will be essential for success moving forward.

DRIVING FACTORS (continued)

5G: 5th Generation Cellular

"The world's connectivity needs are changing. Global mobile data traffic is expected to multiply by 5 before the end of 2024. The current 4G networks simply won't be able to keep up.." - Ericsson

Demand for cellular service within the County continues to grow at a rapid pace. The emergence of 5G networks on the horizon presents a new challenge to wireless operators across the province. 5G stands for 5th Generation cellular network technology. In most rural areas, it operates primarily in the 600mhz frequency range, which allows much higher reliability, penetration and capacity from previous cellular technologies. This increased capacity will require access to fibre optic networks for it to reach its full potential. This technology is going to change how wireless devices connect to the internet, and its effects will be felt across all sectors, including home, farm, business and industry.

FIBRE OPTICS—The Game Changer

Fibre Optic Cables are used globally as the backbone of our modern society. They are deployed for ultra high capacity data transmission over sometimes vast distances. Such high capacity allows for the combination of many services over the same cable. They are not directly susceptible to weather conditions, making them extremely reliable connections. With the introduction of 5G cellular networks fast approaching, capacity will be critical to the successful deployment of this technology. Wireless providers face delivery challenges without a high capacity connection to the internet (i.e. 'backhaul'). Licensed wireless links are typically used where fibre is not available. These links have a lower initial cost to install, but the operator is limited in capacity both by the capabilities of the radios, as well as ongoing licensing costs for the links. More data = more cost. They are often affected by weather conditions, such as lightning, fog, snow and rain, etc.

It is for these reasons Saddle Hills County is considering enhancing its current networks with fibre optic cables.

METHODOLOGY

Considering the goals and driving factors herein described, a general methodology has been outlined for an approach to the Broadband Strategy, and the associated Action Plan.

Saddle Hills County has a relatively large geographic area with topographical constraints of hills, valleys and tree coverage, causing difficulties in providing broadband services to some areas. The low-density population in the County further impacts the costs of providing those services.

A hybrid broadband model utilizing a combination of service delivery techniques is a realistic and economical approach. In the majority of the rural areas of the County, wireless broadband services are a practical and suitable solution. However, as previously discussed, fibre will be required at strategic locations to ensure capacity needs can be met. It is anticipated that fibre-to-the-home in most rural areas will not be feasible in the near future, due to the prohibitive costs. The County is aware that new deployment strategies are being tested and if/when they become more economically viable, further assessments may be made.

<u>Wireless</u>

When approaching wireless deployment, the following factors are considered:

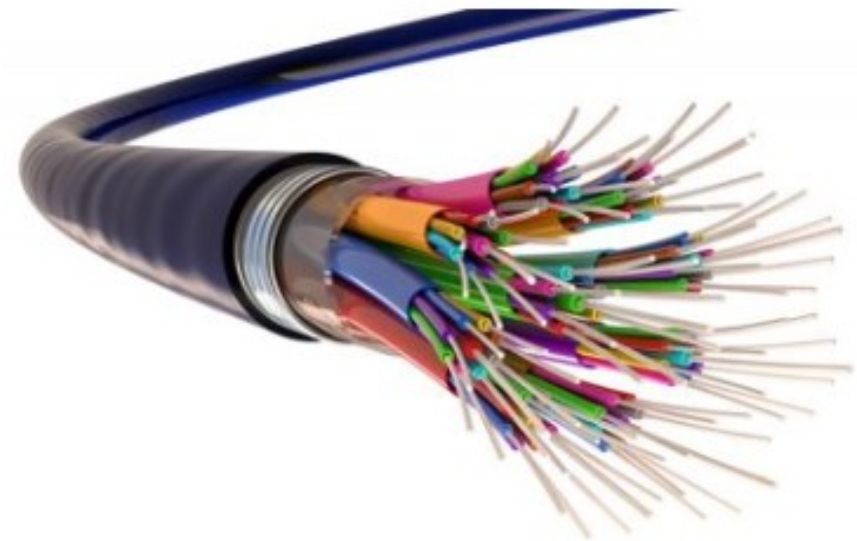
- Consider where additional mobility towers or co-location partnerships are beneficial, based on the needs of the area.
- Upgrades to the Utility Communications Network
    - ⇒ upgrades to towers, if required, to support increased load of tenant's equipment
    - ⇒ upgrades to backhaul provisioning based on usage demands (i.e. RF licenses and equipment)

METHODOLOGY (continued)

Fibre

Given the complex nature of fibre optic installations, careful consideration should be given to the following:

- Partner with service provider with a focus on fibre-to-the-home deployment in higher density locations
- Design a County-owned fibre network to meet current and future capacity demands:
  - ⇒ Core fibre network
    - ◊ along major roadways for high capacity services possible for business, industry and public facilities)
  - ⇒ Extended fibre network, includes redundancy ring
    - ◊ To the UCN to provide enhanced capacity for tenants and municipal purposes (wireless links to municipal facilities, radio communications network)
  - ⇒ Ancillary fibre network (serving municipal facilities)



BROADBAND STRATEGY ACTION PLAN

A Broadband Strategy Action Plan is a document to help guide the activities and projects that the County may consider over a period of multiple years. It acts as a roadmap, aligns priorities, allows for coordination of efforts, identifies potential impacts on budgets, and ultimately is the financial planning tool necessary to meet Council's identified goals.

The Broadband Strategy and associated Action Plan should be reviewed and adopted by Council on an annual basis, at minimum, and be flexible enough to be modified to meet new priorities, goals and changes in the financial environment, not to mention the vastly changing nature of broadband technology.

The current year's projects described in the Action Plan will align with the current year's Saddle Hills County Budget. Future years' projects represent a plan in principle only. These future projects are not approved to proceed until either the budget for that year has been approved, or Council has passed a supplemental resolution authorizing the project to proceed.

Following is the 2020 version of the Broadband Strategy Action Plan (Table 1). This plan covers the years 2020 to 2024 and 'Beyond'. The Beyond column identifies potential future projects that may be considered in future years, or eventually may be replaced by other priorities. Keeping them in the Action Plan allows Council to consider if or where these projects might fit within the County's goals and priorities. For each Project ID listed in the Action Plan, a map or brief description of the project follows.

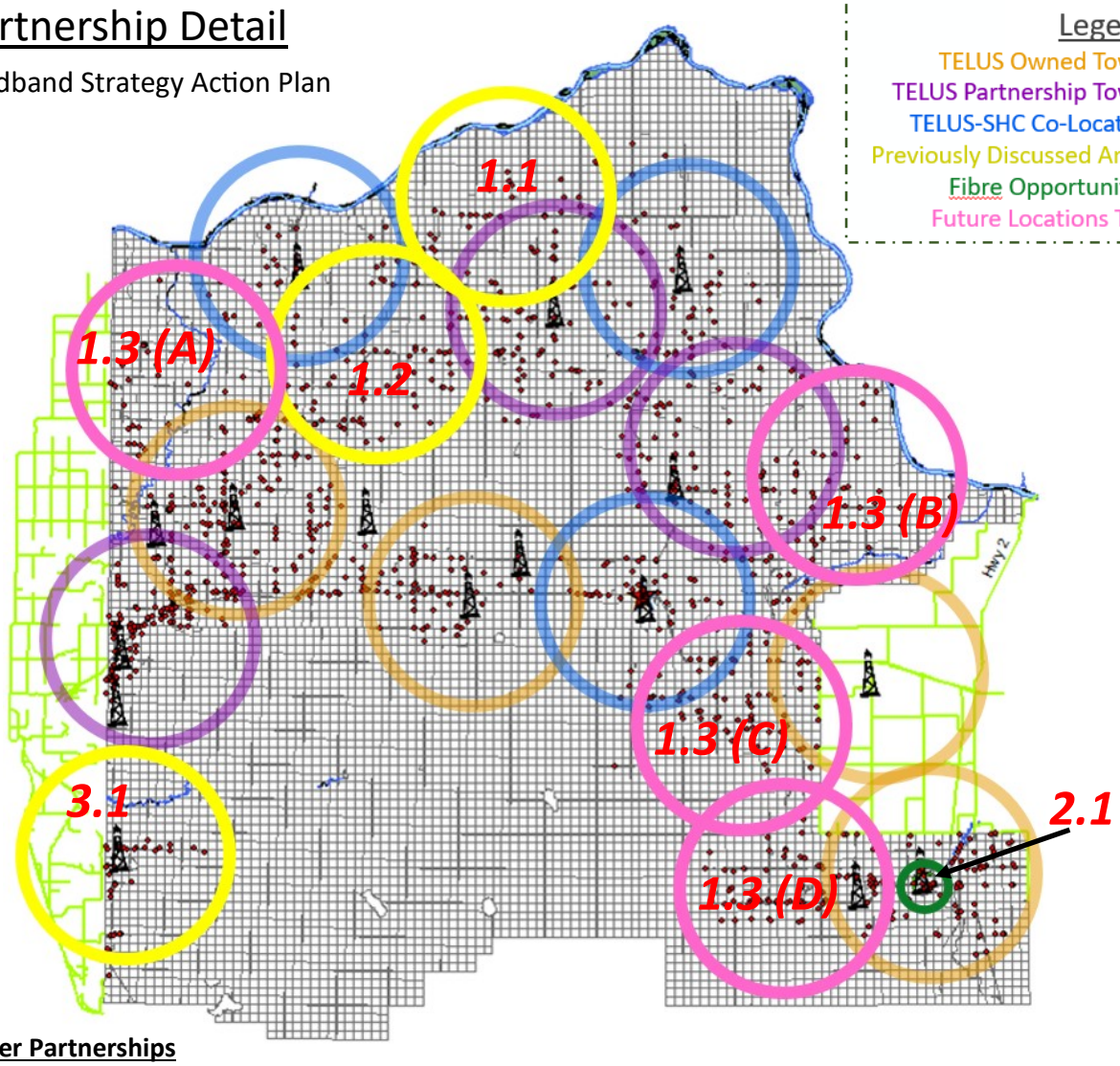
SADDLE HILLS COUNTY

Broadband Strategy Action Plan

		Approved for 2020 budget consideration	Conceptual Plan for Further Consideration & Council Approval (and subject to fiscal budget constraints)				
Proj ID	Description	2020	2021	2022	2023	2024	Beyond
1	**TELUS TOWER PARTNERSHIPS**						
1.1	Silver Valley (north central)	$722,000					
1.2	West of Savanna		$722,000				
1.3	4 Locations TBD						$2,888,000
2	**TELUS FIBRE PARTNERSHIP**						
2.1	Hamlet of Woking (Residents, Municipal Facilities, etc.)		$350,000				
3	**TELUS CO-LOCATION PARTNERSHIP**						
3.1	Swan Lake Tower TELUS Co-location		$500,000				
4	**UCN Capacity Upgrade - Licenses & Network Equipment**						
4.1	License Upgrade	$50,000					
4.2	Equipment and License Upgrade (equip 5 yrs old, repl 3-5 yrs)		$500,000				
5	**SADDLE HILLS COUNTY CORE FIBRE NETWORK**						
5.1	Ksituan Tower to Bonanza SuperNet (SH7-BSN-SH9) and Henderson Creek Tower (Yr 1 Planning / Yrs 2 & 3 Design/Build)		$50,000	$2,000,000	$2,000,000		
6	**SADDLE HILLS COUNTY EXTENDED FIBRE NETWORK**						
6.1	SH7-BSN to Fourth Creek Tower (SH2)					$2,200,000	
6.2	SH7-BSN to Sneddon Creek Tower (SH1)						$1,900,000
6.3	SH7-BSN to Iverson Lake Tower (SH3)						$420,000
6.4	SH7-BSN to Bay Tree settlement (BT)					$1,280,000	
6.5	BT to Sergeant Creek Tower (SH5)						$1,020,000
6.6	SH7-BSN to Moonshine Lake Tower (SH8)						$90,000
6.7	Hwy 680 Loop Connection - redundancy ring						$3,170,000
7	**SADDLE HILLS COUNTY ANCILLARY FIBRE NETWORK**						
7.1	Fibre to Savanna Water Treatment Plant						$30,000
7.2	Fibre to Savanna Fire Hall						$30,000
7.3	Fibre to Bonanza Water Treatment Plant						$50,000
7.4	Fibre to Bonanza Fire Hall						$30,000
	Total	**$772,000**	**$2,122,000**	**$2,000,000**	**$2,000,000**	**$3,480,000**	**$9,628,000**

TELUS Partnership Detail

Refer to Broadband Strategy Action Plan



Proj ID

1: TELUS Tower Partnerships

1.1 Silver Valley Tower (2020)

New Tower Build (Approved)

1.2 West of Savanna Tower

New Tower Build

1.3 Future Locations

(A) East Doe)

(B) Devale

(C) Happy Valley

(D) Westmark

2: TELUS Fibre Partnership

2.1 Hamlet of Woking

3: TELUS Co-Location Partnership

3.1 Swan Lake Tower

5. Core Fibre Network Detail

Refer to Broadband Strategy Action Plan

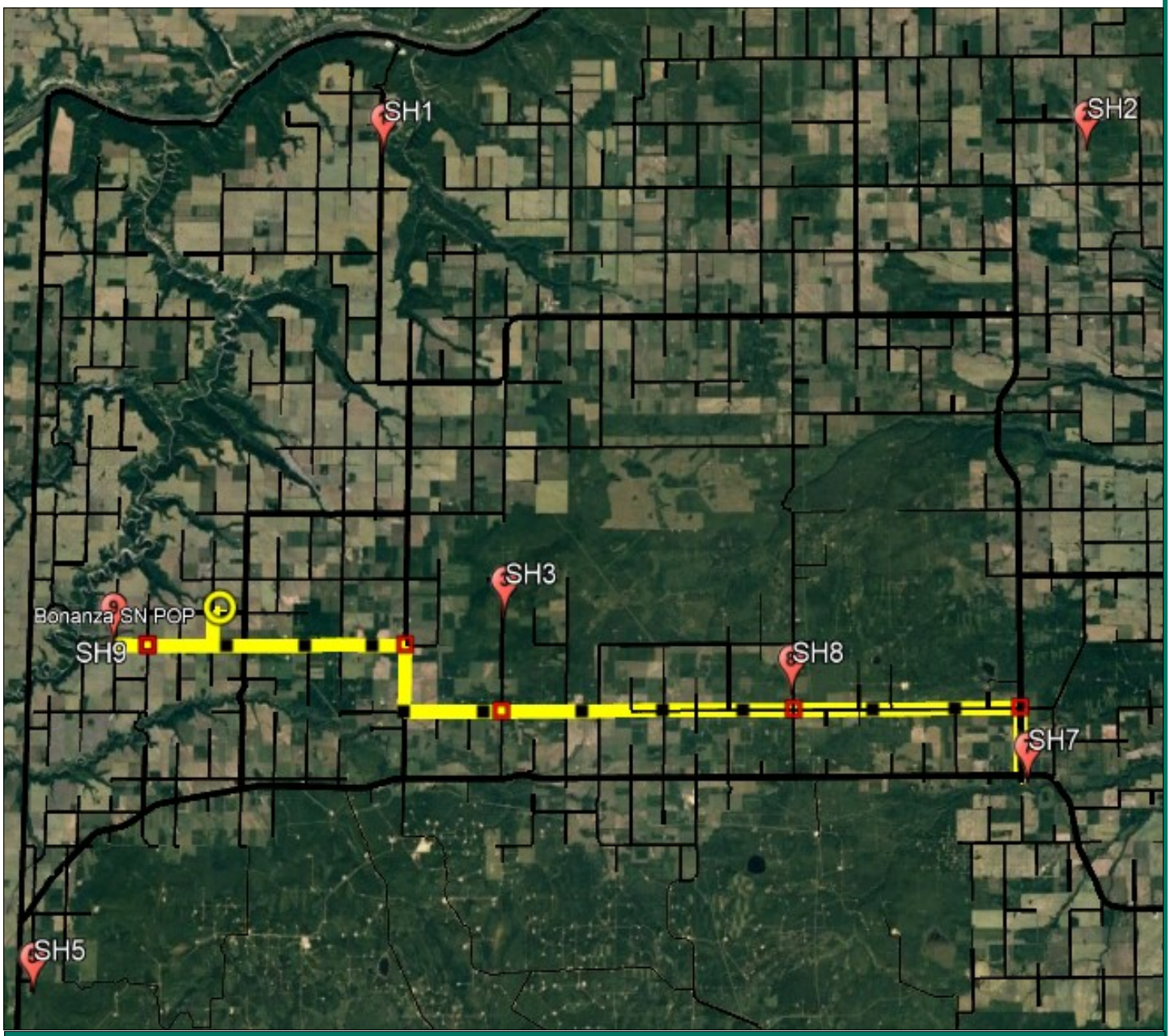
Proj ID

5.1 Ksituan Tower to Bonanza SuperNet and Henderson Creek Tower

5.1 Core Fibre Network

Handholds

Splices



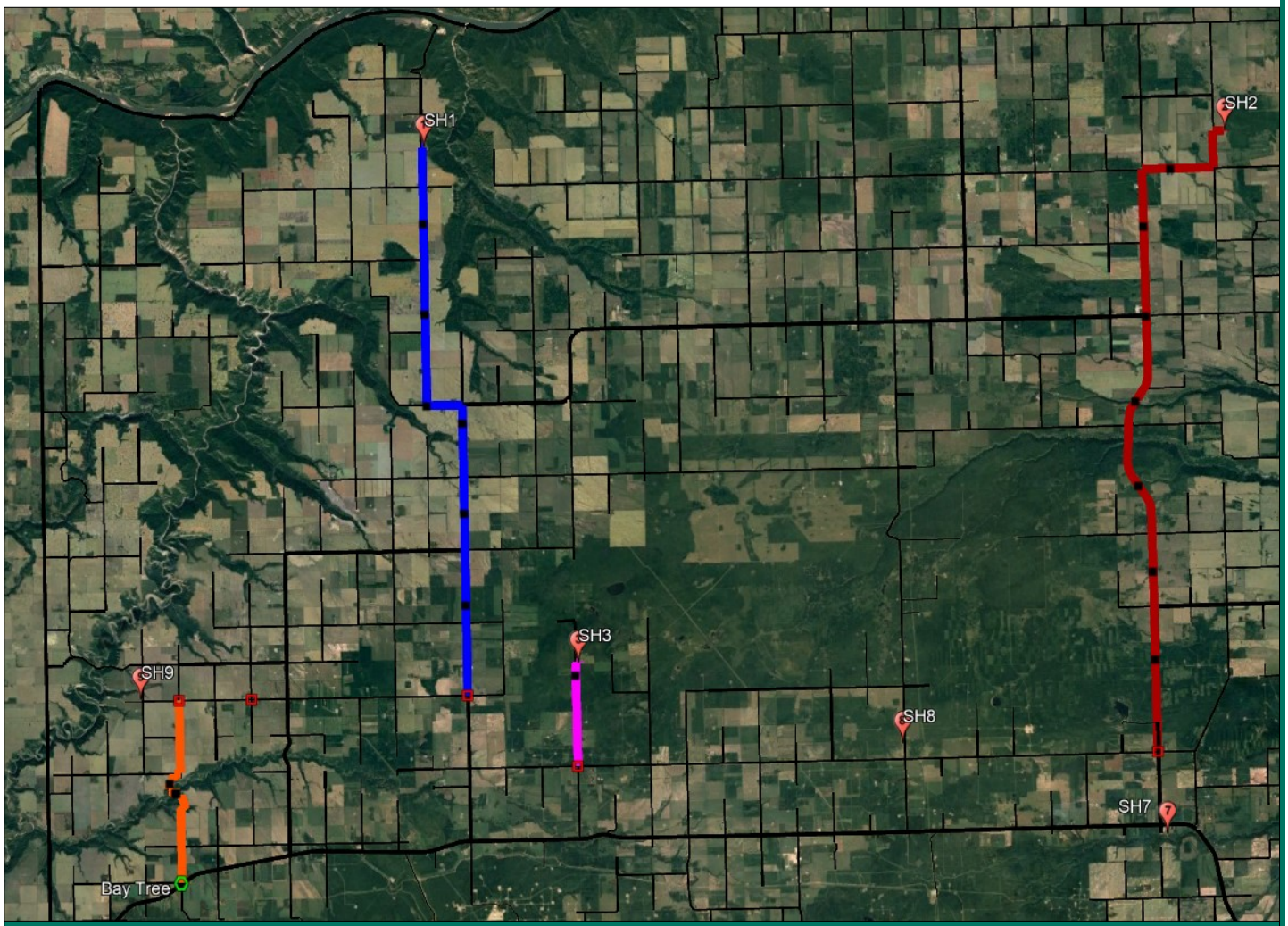
6. Extended Fibre Network Detail

Refer to Broadband Strategy Action Plan

Proj ID		
6.1	To Fourth Creek Tower	
6.2	To Sneddon Creek Tower	
6.3	To Iverson Lake Tower	
6.4	Bay Tree Settlement	

Handholds

Splices



6. Extended Fibre Network Detail

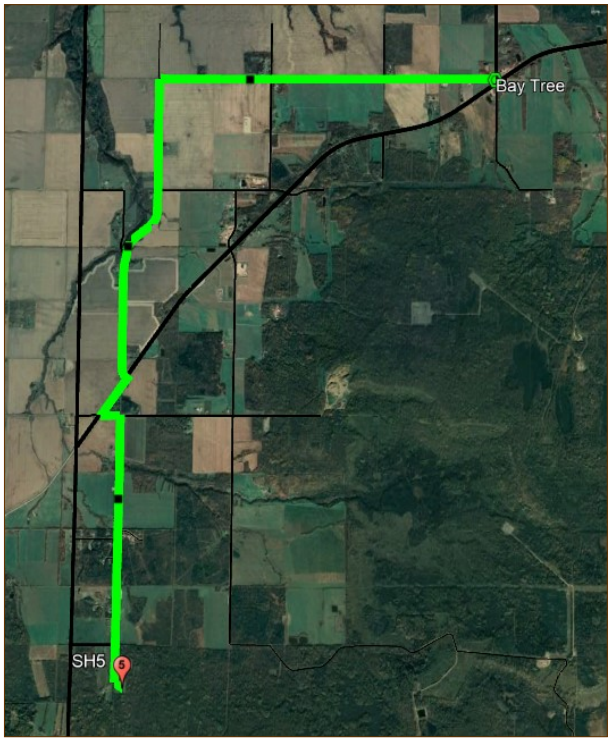
(Continued)

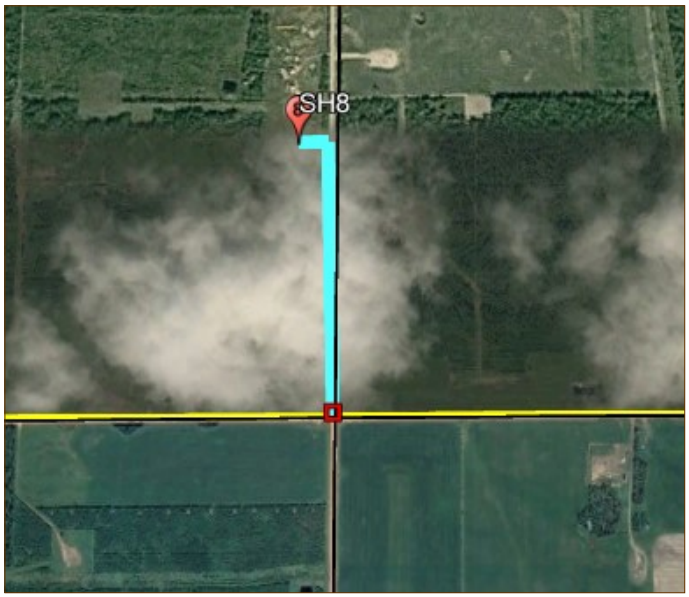
Refer to Broadband Strategy Action Plan

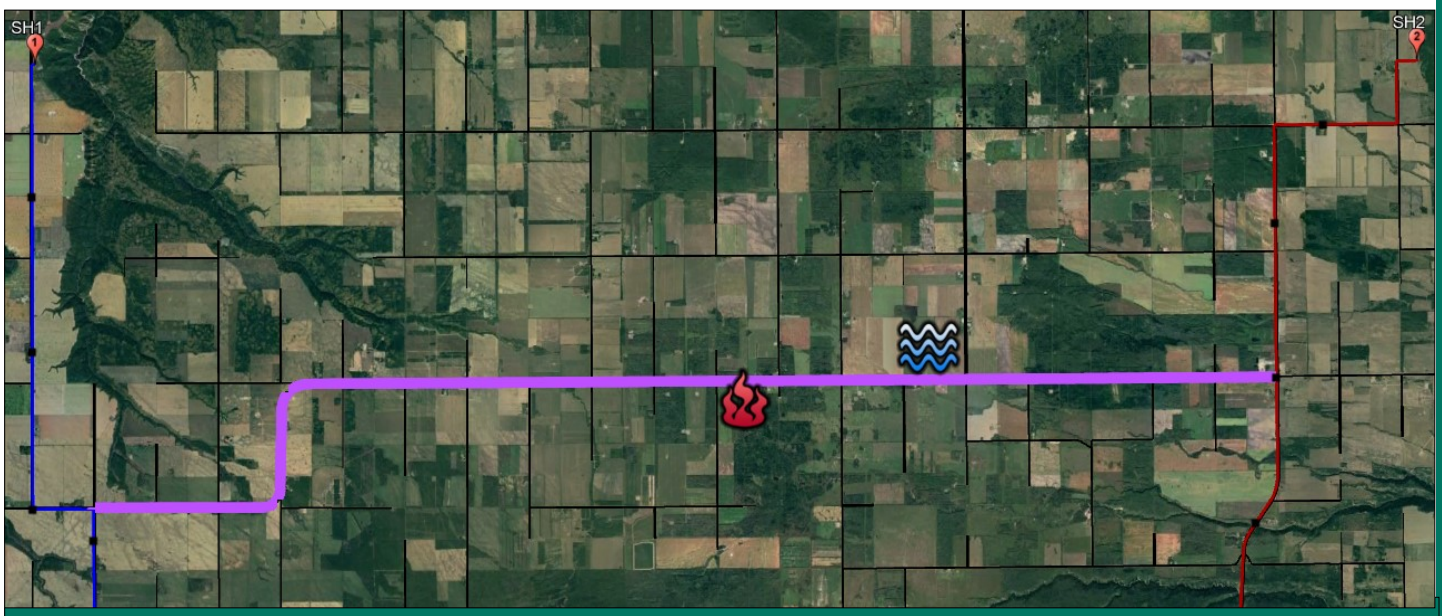
Proj ID		
6.5	To Sergeant Creek Tower	
6.6	To Moonshine Lake Tower	
6.7	Redundancy Loop (See Note, next page)	

Handholds

Splices







NOTE: 6.7 Redundancy Loop Description:

A redundancy loop, (often referred to as a "ring") brings many benefits to the design of a fibre network. Primarily used as a backup in the case of a cut fibre cable, adding a redundancy loop allows the fibre network equipment to seamlessly re-route or "detour" traffic in the opposite direction. In most cases, this detour eliminates the need for a service outage, which may take days or weeks to repair. Having a redundancy loop along Hwy 681 will also allow:

- a fibre connection to both the Savanna Fire Hall and Savanna Water Treatment Plant

- a cost-effective access to fibre for local community facilities, business and industry (enhancing community and economic development)

4. UCN Capacity Upgrade—Licenses & Network Equipment

Proj ID

4.1 License Upgrade

4.2 Equipment and License Upgrade

As explained earlier, the Utility Communication Network uses a licensed backhaul between towers. The existing radio frequency licenses from Innovation, Science and Economic Development (ISED) have the ability to be upgraded to a certain extent without the equipment being upgraded. Upgrades to the backhaul beyond the limitations of the equipment will require the equipment to be replaced and additional licenses to be acquired from ISED. Further, as with typical electronics equipment, it should be replaced every five years.

7. Ancillary Fibre Network

Proj ID

7.1	Savanna Water Treatment Plant	SW 28-81-09-W6
7.2	Savanna Fire Hall	NE 24-81-10-W6
7.3	Bonanza Water Treatment Plant	NW 10-80-12-W6
7.4	Bonanza Fire Hall	SE 08-80-12-W6

After the build of the Core and Extended Fibre Networks, three of these facilities could potentially have County-owned fibre adjacent to them. The exception is the Bonanza Water Treatment Plant, where fibre would be 3.2 kilometers away.


Saddle Hills
COUNTY