SOUTHGROW BROADBAND PROFILES PROJECT MASTER PLAN

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Executive Summary

It is acknowledged that technology and Internet connectivity are driving major changes to economic development and quality of life factors for communities around the world. Having access to quality, reliable, high speed Internet is no longer a luxury for communities who want to be successful in attracting and retaining residents, and in encouraging economic growth. Municipalities are having to consider how technology and Internet access inform the sustainability of the community. While residents may want access to online platforms for entertainment and quality of life purposes, commercial and industrial functions are demanding reliable, quality Internet access as a basic service to enable competitiveness. Communities that can meet these needs hold a competitive edge. Communities who do not may soon find themselves at a disadvantage.

Determining how much Internet capacity a community needs to be successful now, and into the immediate future, is a challenging question. SouthGrow Regional Initiative (SouthGrow) has attempted to provide guidance for its member communities in answering that question, while recognizing that different solutions may be needed for each municipality. Guiding the information presented in this document is the knowledge that while most communities can rightfully state that they currently have broadband Internet access, SouthGrow encourages efforts towards all communities eventually attracting fibre connectivity, recognized as the only future proof method of connectivity, and the gold standard of broadband.

Within the SouthGrow region, 8 member municipalities have successfully secured a private fibre build in their community. Several others are exploring this option, either through attempting to attract private investment, or in the case of one county, planning to develop the infrastructure itself. Most SouthGrow communities have a range of Internet access, from high speed to challenges with reliability, speed and capacity. Attaining high-speed broadband connectivity ranks as a priority for SouthGrow communities from low to high, but consistent to every community is the influence that increased technology use, and desire for connectivity, is having upon development.

SouthGrow communities can thereby be classified into three broad categories of connectivity: Fibre Communities, Served Communities, and Underserved Communities. While the definitions developed for this report classify SouthGrow communities along a continuum of broadband capacity, the segmentation of the communities is based on published information available from ISP's, and anecdotal information provided by the communities. This report includes a tool, called the Broadband Index, that was used to generate an evaluation of how communities are using the Internet access and capacity they currently have. The Broadband Index values generated by this tool are intended to generate discussion and further evaluation, not be used as hard and fast outcomes. This tool can be further used by the communities to conduct a more thorough assessment of actual citizen use of Internet to better determine where needs are, and what priorities might be established to facilitate the best use of technology.

Knowing when to seek enhanced levels of broadband connectivity, such as fibre, is the question at hand. In attempting to quantify the costs of not having consistent, reliable, high-speed broadband capacity in a community, emerging technology in industries including health care, agriculture and education spoke strongly to the amount of investment and attention being given to these areas. However, little information was available to actually put a dollar figure on the value of having, or not having, this capacity in a community.

The cost of installing fibre optic cable is still prohibitive for nearly every municipality. Furthermore, operational costs and municipal focus must also be considered when evaluating such an investment. Thus, most SouthGrow communities are in the position of relying on private Internet Service Providers (IPS's) to make investments of upgrades to fixed wireless services, satellite services or fibre installations.

The size of a community and its location, relative to geographical and physical features, are major considerations for ISP's when evaluating where to make broadband investments. However, SouthGrow communities who have been successful in attaining fibre upgrades have managed a number of additional factors that contributed to their success. These include: having clear priorities and strategic plans in place for their community; having strong positioning that distinguishes their community from others, based upon strengths and unique attributes; having a culture of being investment ready, making it easy for ISP's to choose them; being proactive, providing hand-on leadership and communication; and cooperating and collaborating regionally.

SouthGrow Regional Initiative can provide continued support to the enhancement of high-speed broadband internet capacity within the region by supporting increased investment readiness within member communities; facilitating communication with communities, between communities, and with ISP's; establishing itself as the regional hub of best practices and information related to emerging technologies and broadband; continuing to facilitate regional collaboration, with an aim toward developing strategies that may speak to the bigger picture; and investing in ongoing research to assist with future planning.

Note to Reader

The information presented in this report was compiled between late February and April 2017, and is largely based on input from SouthGrow member municipality Chief Administrative Officers, other administration, some mayors and councillors, and a few community champions. While the Secondary research and situational analysis were informed by external sources and research, the observations and recommendations related to SouthGrow are based upon anecdotal information provided in meetings in each community with the individuals noted.

All communities and counties were visited with the exception of the Blood Nation, with whom we were unable to meet in the time frame given. An individual report was developed for each community, and all communities were provided with the opportunity to make edits or add additional insights to their report prior to its inclusion in the Appendix of this document.

This report should not be considered comprehensive. Rather, it represents a snapshot of the realities and circumstances facing the communities in the SouthGrow region at present. Efforts were made to consider broadband connectivity and technology use within these communities relative to other municipal and community considerations.

Some commonalities to be aware of include:

- All communities will be affected by municipal elections October 2017.
- Almost every community questioned the Canada Census data and stated that it was incorrect. This data, while quoted in the individual community reports, should be used as a general indicator of size and of trend towards growth or decline, rather than hard fact.
- Demographic data by community from the 2016 Census was not available at the time of this report, so descriptions of community composition within the community reports is entirely based upon information provided by the community.

Much can be said about broadband connectivity and emerging technology. This report focuses on issues relevant to the SouthGrow region, and how SouthGrow and its member communities can best create technology-friendly environments in which residents, and the private and public sector can be successful.

Situational Analysis

PESTLE

Political

The political environment around broadband connectivity has shifted as a result of a review of Canada's basic telecommunications services conducted by the Canadian Radio and Television Corporation (CRTC). In late 2016, the CRTC established a universal service objective that Canadians in all areas of the country, including rural and remote areas, should have access to voice services and high-speed broadband Internet access services on fixed and mobile wireless networks. The new targets for these services are:

- Speeds of 50 Mbps download/10 Mbps upload for fixed broadband services
- An unlimited data option for fixed broadband services
- The latest mobile wireless technology available not only to all homes and businesses, but also along major Canadian roads

The release of this service objective and related targets has created a national discussion about many facets related to service provision, and how to achieve the targets. Calls are being made for a national broadband strategy, though it appears unlikely that such an initiative will be supported with resources from the federal government in the near future. Subsequently, there is interest from champions of high-speed broadband connectivity in Alberta to develop an Alberta Broadband Strategy. Initial requests made of Service Alberta representatives at the 2017 Digital Futures Conference for a mandate to develop an Alberta Strategy were not successful, so a number of advocates representing regional economic development alliances, industry partners and interested municipalities started informal organization toward forming a working group to generate a grassroots strategy for Alberta.

The expiration of the existing SuperNet contract in June 2018 has caused some uncertainty, especially for communities who rely on Axia FibreNet as their main Internet Service Provider (ISP). While governed by Service Alberta, operations and management of the SuperNet are contracted to Axia SuperNet Ltd, a wholly owned subsidiary of Axia NetMedia Corporation, on the Extended Area Network (EAN), and to Bell Canada on the Base Area Network (BAN). On February 16, 2016, Service Alberta issued a Pre-Qualification Request (PQR), to identify potential service providers, to review business and technical requirements, and to gather current information on industry trends. In May 2016, telecommunications operators Axia, Bell, Telus, and Zayo were prequalified to participate through the PQR process. [1]

The upcoming contract end date has also generated discussions related to the intent of the SuperNet and the concept of open access. There is growing sentiment that any fibre installation within a community should provide open access, allowing interested entities equal access at the same price, to encourage greater opportunities for fibre-based commercial or public operations.

Finally, Alberta will be having municipal elections in October 2017. Much of the content of the SouthGrow Broadband Project report is based upon directions established in member municipalities by current Councils and their administration. Changes to community leadership could impact the implementation of some of the recommendations of this report.

[1] https://wiki.cybera.ca/display/DIR/Alberta+SuperNet

Economic

Alberta has suffered an economic slowdown related largely to a decrease in the price of oil. The SouthGrow region is not as affected by changes in the oil and gas industry as other areas of the province, though some sub-regions within SouthGrow feel the impacts to an extended degree. Efforts to develop sustainable industries less connected to the oil and gas sector are using technology and connectivity to create success.

Within rural Alberta, access to reliable, quality high speed Internet has become an important consideration for commercial and industrial operations. From food production to transportation, graphic design to insurance sales, highly technical systems are relying on continuous connectivity for local and global operations. Technology and connectivity create a level playing field from which companies can be successful based anywhere that these are available.

A number of SouthGrow communities have successful and growing operations that are creating sustainable employment and contributing to the local economy because they have access to high-speed broadband connectivity. The economic future for SouthGrow and its communities will become more dependent on maintaining and expanding broadband connectivity. Communities without this capability may experience challenges in attracting and retaining private economic generators.

Social

The Internet in its most basic form is a platform for communication. Broadband Internet and larger amounts of Internet usage are linked to richer forms of communication, and the transferring of more information.

Heavy users of technology have a very different value set than light or non-users, generated by the speed of technology, and the opportunities, choices, and connections it creates. Heavy users and early adopters value the functionality and customizability that technology and connectivity offer. This can be seen in the growing popularity of items such as:

- Smart TV's that stream shows and movies from the internet
- Smart doorbells that allow users to view who is outside their door from a connected device anywhere in the world
- Smart light bulbs that allow users to control lights from their connected device anywhere in the world
- Smart thermostats that allow users to control their furnace and air conditioning from their connected device anywhere in the world
- Smart refrigerators that have cameras that take a picture each time the door closes so users can remotely view the contents of their fridge from a connected device anywhere in the world

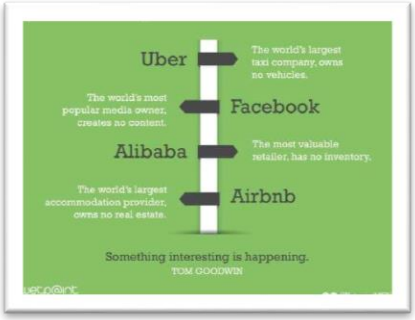
The term "Internet of Things" refers to a world where everything is plugged into the Internet and by extension, is available when, where, and how users want. This is creating a major cultural shift where individuals feel empowered to be in control. For example, watching a television program used to mean waiting a week to view it at a time scheduled by the television network. Now people can watch what they want, when they want and on a multitude of devices. From Digital Video Recorder's (DVR's) to programs

produced specifically for online audiences on platforms like Netflicks or Hulu, people can view entertainment on their own schedule.

In addition to high functionality and customizability, the Internet of things is creating a cultural shift in moving responsibility from the individual to physically manage and operate the various elements in one's life, to technology performing these actions. This paradigm shift can be seen in innovations under development and currently available such as:

- Robotic vacuums that vacuum floors by themselves
- Computer chips in vehicles
- Self driving cars

This shift is readily accepted by younger generations, but older demographics fear it to some degree because they cannot be in control of managing the technology. Whereas the layman mechanic could once change spark plugs or make minor vehicle repairs, this is not possible in newer vehicles. There is a clear divide amongst the population between those who are comfortable allowing technology to manage daily functions, and those who are not.



Finally, technology and connectivity are changing the way that industries operate, and are defining new methods by which goods and services can be delivered. Regular citizens can participate in offering goods and services in record numbers without major cost outlays for infrastructure, permits, businesses licenses or adhering to industry-established requirement and standards.

The rapid development of technology-enabled functions in all segments of life have demonstrated a few commonalities worldwide. Two significant trends are:

- Innovation is driven by the private sector and champions, not government.
- Youth are the fastest adopters of technology.

These trends are important to acknowledge as they will provide both opportunities and challenges to the SouthGrow Region. Opportunities exist in creating communities that support innovation and which facilitate entrepreneurs having the freedom to establish operations. Ground breaking inventiveness can take place anywhere now that has Internet connectivity. Small, rural communities with Internet connectivity are no longer at a disadvantage when it comes to fostering globally successful organizations. This opportunity also speaks to retaining youth in small communities, and attracting younger demographics to small communities rather than migration to larger centres. The old pattern of youth leaving rural communities to attend post secondary schools or get jobs in the cities may well change as technology and connectivity provide youth with the potential to learn, develop and create their own successes right from home.

The challenges associated with these trends affect mainly communities without connectivity or a culture that supports and encourages innovation. Lack of connectivity is becoming a deal breaker for young families looking for a community to call home, and especially for businesses and organizations who want to conduct businesses beyond their immediate surroundings. Even businesses who tend to only serve their immediate neighbours will require basics like email and the ability to upload and download documents and software. Communities who cannot secure sustainable Internet infrastructure into the future will likely see negative impacts.

Understanding how these cultural changes will affect communities should not be overlooked. As communities embrace technology more and support the advancement of broadband usage, they could face a polarized community separated by technology and access. For early adopters, the full development and integration of the Internet of things can't come fast enough, while for others, the idea of this future seems rather frightening. As the Internet becomes a larger part of the community, how will the community promote local economic options as alternatives to online shopping and ordering? As residents use more and more devices and move to a more digital lifestyle, greater Internet bandwidth will be required. Will the generational gap between users narrow as older demographics embrace technologies designed specifically for them, and embrace the power of faster and less expensive communications? Or will individuals become more isolated if they do not learn the basic skills needed to operate technology driven devices?

Technology is being integrated into many of the functions of daily life, and this shift is creating an environment where from self-scanning items at the grocery store, to reserving a camping space using an online reservation system, individuals are going to have increasing difficulty avoiding use of it.

Technology

New technology is emerging at a rapid pace. The differences in systems operations and expectations in a period as short as two years can be major. Companies and communities are being forced to stay abreast of new technologies as they are released because the efficiencies they can create deliver a definite competitive advantage, and citizens have become accustomed to adopting use of systems that give them customized and immediate services.

All industries are experiencing the impact of new and emerging technologies. These influence plans for operations and development, while individuals on a personal level embrace options for expanded entertainment and communications. Future expectations include that most programs will operate from the cloud, rather than be based on a computer or physical device. This shift will require access to reliable connectivity in ways previously unimagined.

Legal

The 2016 universal service objective released by the CRTC may have legal implications for communities. Initial discussions have focused on if there is a legal requirement to meet the basic service objective, and whose responsibility it is to do so.

Further to this, the CRTC is in the process of determining definitions from which to evaluate current Internet service levels within Canada.

Environment

Technology and connectivity have fundamentally changed the way operating environments are viewed. Where as previously primary factors for consideration often included land, transportation access, physical distance to other markets, distance to labour force, access to basic infrastructure (water, sewer, electrical, etc.), and tax rates, an additional key consideration now is access to connectivity. This has affected the operating environment in two fundamental ways.

First, as technology and connectivity become more integrated into operations across different industries through the adoption of standard platforms, communities who cannot offer connectivity will not be considered for these operations. Standard platforms that already require this include online accounting, inventory control and ordering, and communications. While high-speed broadband connectivity may not currently be a requirement for all operations, it is for many, while consistent, reliable high speed Internet is for most others.

Second, many operations require less physical space as a result of operating solutions provided by technology and connectivity. Many commercial entities can be operated from a laptop, tablet or even from a smart phone. Industrial operations may still require the traditional elements noted above, but equipment is being designed to take less space, operate more efficiently, and use technology for many applications that once required human hands. This equipment in many cases can be controlled remotely and via wireless signals. Customers are no longer required to physically enter a business in order to make purchases. This change to the concept of what a commercial, industrial or retail environment looks like offers great opportunities to communities who have connectivity.

Finally, technology and connectivity are playing a major role in the lessened impacts on the physical environment from the perspective of ecological sustainably. Many communities and businesses have gone paperless, using devices like tablets and online services to greatly reduce paper usage and waste. Technological developments aimed at efficiencies in reduced use of water, power and space are lessening the impacts on the environment as well as costs of operations. Major investments are being made to develop and use technology to generate different forms of power, from solar to geothermal. Efficient operations, from an ecological and cost standpoint, are emerging as the new standards by which successful operations are measured.

SWOT

Strengths	Weaknesses
• 11 high-speed broadband communities, of which 8 are connected with fibre technology • Several communities embracing innovation and positioning built upon unique strengths • Several communities with clear priorities and supportive strategic plans for creating the community citizens want • Strong commitment from many communities to citizen engagement • Multiple ISP's offering a range of services throughout region • All areas of region have some level of connectivity •	• Disparities between communities related to quality of Internet services • Disparities between communities related to investment readiness and ability to attract upgraded Internet services • Physical and geographical challenges to areas of region that prevent reliable wireless signals • Communities with small populations make for difficult business cases to secure ISP investments and upgrades • Competing infrastructure needs (water, sewer, roads) take resources and attention of councils and administrations
Opportunities	**Threats**
• Develop a standard of investment readiness for all SouthGrow communities • Attract investment toward creating high-speed broadband connectivity throughout majority of SouthGrow region within 5 years. • Development of Broadband education centres throughout the region to educate and prepare communities for best adoption and use of emerging technologies. These can be linked to various business and tech centres already being developed in many communities. • Facilitate ongoing communication between communities and partners to share information and best practices • Communicate with ISP's to understand opportunities and challenges, and support continued service evolution in region • Facilitate creation of a regional strategy focused on promotion related to high-speed broadband capabilities	• Greater disparities and the development of "have" and "have not" communities with the region if adequate, quality, reliable Internet access cannot be established for all communities. • Division within communities between residents who adopt technology usage and those who do not • Major changes to leadership following October 2017 municipal elections could disrupt progress and commitment toward attaining broadband connectivity in some communities.

Summary of Secondary Research Findings

The Secondary research conducted for this project focused on reviewing large, validated studies and sources outside of the materials provided by SouthGrow Regional Initiative. The aim was to substantiate, as quantitatively as possible, the potential impact of high-speed Broadband on the SouthGrow Region so to determine the costs of not acquiring this level of connectivity.

The challenge in conducting this secondary research is that the speed at which advancements in technology and broadband connectivity are happening are so fast, it is difficult to find quantitative data for evaluation. Much of the information in priority areas, especially related to heath care, is not yet available. As noted in the PESTLE analysis, a majority of innovation is being driven by private enterprise. These innovators have an interest in safeguarding proprietary information at this stage of development. For example, Telus promotes that they are one of the largest digital health care companies in Canada, but data to support or dispute the financial impact on communities able to access their products and services is not available. Results are anecdotal and story-based.

Thus, the general findings of the secondary research support the premise that high-speed Broadband connectivity enhances delivery of services in the key areas of education, economy, social and recreation, and health, and that communities who cannot provide connectivity will be at a disadvantage compared to those who can.

The size of the disadvantage, however, cannot be quantified at this time.

Further to the secondary research and the challenge posed in trying to quantify the size or cost of the disadvantage, a tool detailed in the next section of this report aims to evaluate where SouthGrow communities currently exist on the spectrum of broadband capacity, and what that level of access looks like relative to current community use of technology, and anticipated use within two years. It is recommended further in this report that individual communities use this tool to assess the desires of their citizens related to Internet connectivity to more accurately predict the individual community costs associated with not acquiring high-speed Broadband.

Primary Research Findings

Summary of ISPs and WISPs in SouthGrow

Axia – Axia is a respected fibre based provider that installs fibre networks in rural communities. They offer plans from $59/month - $109/month and speeds of 25mbps-100mbps, with an unlimited data cap.

CCI Wireless – A local WISP start up, this service provider offers from 2mbps – 10mbsp, with an unlimited data cap. Their prices are from $50/month-$100/month and the reliability of their network is good. The company is continuing to grow and is doing a lot of work in northern Alberta.

Bell – Bell is a mobility option for internet users in Alberta. They have great geographical coverage with their mobility plan and publicly offer service of 5mbps. This works for isolated communities and residents, but has significant limitations. The device which gets the mobility signal and creates a local Wi-Fi network is not great for network sharing (i.e. users would see problems when connecting more than a few smart devices). This option is also limited when it comes to data caps, offering plans from $10/month - $105/month and a data limit of 100mb – 20GB. Additional data is available, but with $10/GB overage charges, things can get increasingly pricey.

Shaw – Shaw offers a Cable broadband connection to customers. Ranging from $55/month-$85/month service ranging from 5mbps – 150mbps. High data limits are unlikely to be an issue for customers, 65GB-1000GB. Although Shaw is not currently utilizing a fibre network, they are pushing a significant amount of data through their existing copper cable system.

Telus – Telus has several connection methods, primarily using a broadband cable connection. They also have a fibre network, mobility options, and in some places, use a repurposed telephone connection to transmit the internet. Most plans range from $65-$85 and offer speeds at 15mbps-150mbps. Telus offers their 150mbps service with their fibre network. The fibre network can be much faster, but Telus is easing it into the market slowly. Telus mobility options are not great for home internet usage, as data caps are from 100MB – 10GB and range in price from $60-$135, and additional data after exceeding your data limit cost $50/GB, which could lead to a very scary phone bill. The Telus telephone system is advertised as much as their other options, however it has been offered from 2mbps-12mbps, costing $50/month-$90/month.

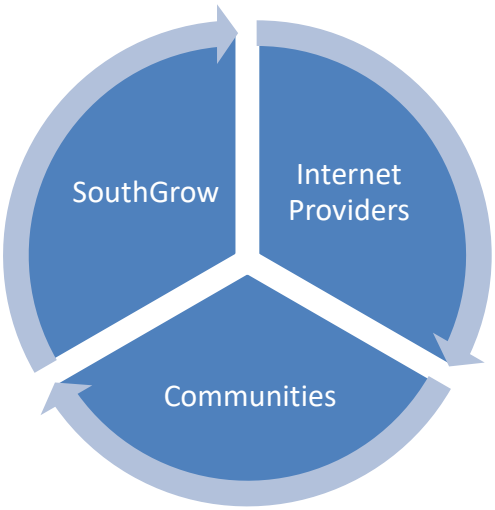
Rogers – Rogers has a mobile internet service option that covers nearly all the SouthGrow Region. Prices range from $10-$145 and offer data limits from 100MB – 100GB. Comparing this option to urban access is still limited due to the limitation of connecting more than a few devices, and LTE speeds cannot compete with broadband connections.

Milk River Cable Club – The Milk River Cable Club is a local WISP that was mentioned multiple times in the southern part of the SouthGrow Region. They offer services from 10mbps – 50mbps at comparable rate of $35/month-$135/month. Reliability and consumer sentiment seems positive with this local option. The Milk River Cable Club has looked at options to install a fibre network in their community and decided it was possible, so this could be implemented in the future.

Wi-Fibre – Wi-fibre is another Local WISP that was spoken of very highly. They offer rates from $40/month-$80/month for service speeds at 3mbps-12mbps. Although speeds are not high, discussion with this local champion/entrepreneur yielded the discovery that they will be improved upon over time.

Xplornet – Xplornet is a hybrid service of WISP and satellite access. They offer internet speeds of 5mbps across multiple plans, ranging from $65/month - $99/month. Speeds do not increase with higher tier plans, instead the data limit range is from 10GB-50GB. The satellite coverage is available to nearly every person, however that expensive technology is near time for an upgrade. Xplornet has announced that they are launching a new satellite capable of offering 25mbps service. This will be good for communities if service rates are not too expensive. Xplornet is a large company that Canada wide has been working to service small communities, and is known to purchase smaller WISPs (like Platinum, a company that previously operated in the SouthGrow region). Consistent reliability and speed issues were reported throughout the SouthGrow Region related to the available service from Xplornet.

Shockware – Shockware advertises rates around 10mbps but doesn't advertise pricing plans. They were unavailable for comment.



Community Segments - Fibre, Served, Underserved

Broadband

Broadband refers to any dedicated internet connection via satellite, antenna (wireless) or cable, and ranges in speed from dial up to high speed.

Broadband internet is - a dedicated access or connection to high speed internet.

Fibre

Fibre refers to the newest and most advanced form of broadband Internet with theoretically **no limit** to speed, capacity or expansion potential.

Fibre is considered future-proof because of its unlimited potential.

Classifying each type of Community

Fibre

- A fibre community is a community which has a currently operating fibre optic connection running through the community, and a large majority of the community has access to, or can access, the fibre network.

Served

- A served community is a community that has an Internet connection healthy enough to support the current or estimated usage of Internet. A served community can be subject to interpretation, based on the timeframe of reference (i.e. a community could be classified as currently served, but if accounting for expected growth they could be underserved).

Underserved

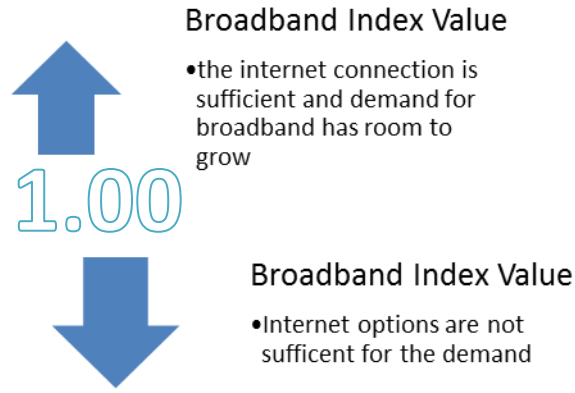
- An underserved community is a community that cannot handle the demand for Internet, based on the current usage or estimation of usage.

Note: These three classifications mirror language that the CRTC is using, but has yet to put definitions to. These definitions were developed for the purpose of this report to assist SouthGrow in identifying where member communities might fit on the spectrum of Internet access and capacity.

The Broadband Index

How we determine classification

The broadband classification is determined by assigning a broadband index value. A value of less than 1 means the internet option is not sufficient for the demand. A broadband index of 1 means the internet is exactly sufficient for the demand, with no room for growth. Lastly a value of greater than 1 means the internet connection is sufficient and demand for broadband has room to grow. The higher the number, the more room for growth within the existing option.



The broadband index is determined with the following algorithm:

$$Broadband\ Index = \frac{-\left(\left(\frac{mbps_m}{mbps_d*\left(\frac{\Phi^n-(-\Phi^{-n})}{\sqrt{5}}\right)}\right)*\left(\frac{GB_m}{GB_d*\left(\frac{\Phi^n-(-\Phi^{-n})}{\sqrt{5}}\right)}\right)\right)-\sqrt{\left(\left(\frac{mbps_m}{mbps_d*\left(\frac{\Phi^n-(-\Phi^{-n})}{\sqrt{5}}\right)}\right)*\left(\frac{GB_m}{GB_d*\left(\frac{\Phi^n-(-\Phi^{-n})}{\sqrt{5}}\right)}\right)\right)^2-4\left(\frac{\$_m}{\$_d}\right)}}{2\left(\frac{\$_m}{\$_d}\right)}$$

The algorithm compares the prime market option to the needs/wants (Internet Speed, Cost, and Limit) of a subject (which could be a community, individual, or business), then it predicts the increase of the needs over a set period and outputs an index score for the subject at that point in time.

Since the needs/want and prime market option is different for every subject, the more granular the test is done the more accurate the test is. Below are some examples of what the index would output for the various types of households and internet options.

Broadband Index Demo for various (users/subjects)

A casual/light Internet user is someone who doesn't spend much time on the Internet. Activities might include email checking, basic online research, and the occasional SD (standard definition) online video (short). They don't require a high Internet speed, nor do they require large amounts of data.

The average modern family owns a group of devices, typically multiple per person. Smart phones are always connected while home, along with some Wi-Fi enabled devices like TV's and printers. HD Movie streaming and gaming requires a solid connection of 25mbps. A higher data limit is also required due to the amount of downloaded information.

The Heavy internet user(s) have multiple high demand devices connected, such as streaming UHD movies (Ultra High Definition) while others are also streaming content or playing games. Multiple constantly connected devices, smartphones, tablets, laptops, printer, and various IoT devices (thermostat, smoke detectors, speakers, etc).

	Casual/Light internet user	Average Modern Family	Heavy Internet User(s)
Internet Needs/Wants	Internet speed required: 4mbps Minimum Download Limit: 10-30GB Internet Budget: $75	Internet speed required: 25mbps Minimum Download Limit: 100GB Internet Budget: $75	Internet speed required: 50mbps Minimum Download Limit: 300GB Internet Budget: $85
Rural Satellite Internet • **5mbps download** • **20GB limit** • **$75/month**	Current: 1.25 2 Years: 0.91 3 Years: 0.35	Current: 0.04 2 Years: 0.03 3 Years: 0.01	Current: 0.00 2 Years: 0.00 3 Years: 0.00
Average WISP • **12mbps** • **No Limit** • **$65/month**	Current: 3.46 2 Years: 2.52 3 Years: 0.96	Current: 0.55 2 Years: 0.40 3 Years: 0.15	Current: 0.31 2 Years: 0.23 3 Years: 0.09
Average Town/City Plan • **40mbps** • **300GB Limit** • **$76/month**	Current: 148.02 2 Years: 107.99 3 Years: 41.25	Current: 4.74 2 Years: 3.56 3 Years: 1.32	Current: 0.89 2 Years: 0.65 3 Years: 0.25
Fibre / top tier city internet • **150mbps** • **1000GB Limit** • **$85/month**	Current: 1654.41 2 Years: 1206.88 3 Years: 460.99	Current: 52.94 2 Years: 38.62 3 Years: 14.75	Current: 10.00 2 Years: 7.29 3 Years: 2.77

The Broadband Index & SouthGrow Municipalities

The Broadband Index Value is a number that measures **how well internet is being utilized**. Using the formula, the Broadband Index can measure anything - entire communities, an individual household, individual people, or a business.

In evaluating the Broadband Index values generated for SouthGrow communities, the following should be considered:

A. *Limited information for each community was available*. The larger the subject, the more challenging it is to apply the Index because greater information is needed. The information used to generate values in SouthGrow consisted of published internet access from ISP's, and general descriptions of use by community contacts. More detailed information about how the community uses Internet will give a more accurate value.

B. *The Broadband Index Value changes based on usage*. As usage increases, the value will **lower**.
   - For fibre communities, this is a good thing as it recognizes greater uptake of the connectivity and use of the resource. Eventually, as the Index value lowers into single

digits, more capacity can be opened as needed, which will then raise the Index value again. This demonstrates how fibre is future-proof. Capacity is unlimited.

- For non-fibre communities, a lower value still demonstrates use of the resource, but at some point (value of 1.0 or lower), capacity will be maximized. After that point, more capacity needs to be added either though upgraded services, or a fibre build.

C. *Values generated should not be used as hard and fast numbers.* Values generated by the Broadband Index, as applied to SouthGrow communities, should be used as a starting point for discussion and further information gathering, or to measure general changes in usage of the resource.

Identifying the Ideal Broadband Index Value

Each community should consider what value they would like to achieve when using the Broadband Index. It has been suggested that the Index goal should be 1.20, as this value represents that the available access is being utilizing almost entirely, while still allowing room for growth. However, new technology is being introduced at a rapid pace and conceivably, a non-fibre community could go from 1.20 to below 1.00 very quickly if suddenly, most residents made use of a new technology that requires Internet access.

While it might seem preferable to have a high value to demonstrate that there is a lot of room for growth, a high value also shows that available access is being underutilized. This could be compared to developing a new sub-division complete with all necessary infrastructure, then letting it sit unoccupied for years. The capacity for growth is there, but it is not being utilized. Communities who have newly acquired fibre will have high values to start. However, as they start to adapt to their new capacity and make use of it, they should find their values lowering.

Communities should strive for a good balance that makes the best use of the Internet access they have toward supporting the general goals of the community. This could mean any value they determine is best for them, but ideally it should be anywhere from 1.20 to 4.00.

Score	Below 1.00	Below 1.20	Equal to 1.20	Above 1.20	Above 10
Action	Bad News – Need exceeds available capacity.	Not Great – You will likely need to upgrade soon. Carefully gauge usage and don't be afraid to invest.	Great – Balanced usage and availability. Start testing the waters for an upgrade.	Good – More than enough availability to grow usage. Continue to promote innovation.	Underutilized – A plethora of available capacity is not being used. Innovate and encourage Internet usage.
Classification	Underserved	Served	Served	Served	Served – Possibly Fibre

Where communities fit (which categories) & why

	Classification (present)	Note(s)	Classification (Year 2 projection)	Note(s)
Arrowwood	Served (1.69)	Arrowwood is currently served. Although the available speeds are not spectacular, the community seems to be happy with their provider.	Served (1.23)	Arrowwood will still be served in the immediate future. However, the speeds will need to be increased very soon.
Barnwell	Fibre (22.06)	Well serviced for broadband internet, they also have Axia in their community.	Fibre (16.09)	With fibre technology, the community is well served going into the future.
Cardston	Served (15.88)	The town of Cardston is well serviced. A strong business community seems to lend in internet investment.	Served (11.58)	Based on our observed information and current market options, Cardston is well served for the immediate future.
Cardston County	Underserved (0.98)	With very limited data on the area it isn't easy to determine internet usage.	Underserved (0.72)	Based on our information, this area will be underserved.
Carmangay	Served (1.58)	Carmangay seems to have options with the local wireless providers, complaints about some providers and their reliability are cause for concern.	Served (1.15)	With the excellent turnout at the broadband interview it is possible that Carmangay will accelerate usage faster than others.
Coaldale	Fibre (20.56)	The town of Coaldale will be future ready with their fibre network. Index is based on the advertised rates by Telus, however the fibre network should handle significantly more traffic	Fibre (15.02)	Due to the capabilities of Fibre, this index number will be significantly higher as Telus offers a larger internet package.
Coalhurst	Served (22.06)	Although Coalhurst does not have Fibre, Shaw is offering a solution with the same advertised speed. With a lower internet demand, the community is well served.	Served (16.09)	Coalhurst will likely see investment from private internet companies over the next few years, but will be serviced well until that time.

	Classification (present)	Note(s)	Classification (Year 2 projection)	Note(s)
Coutts	Served (1.03)	Although technically serviced, a member in the community mentioned that the service area doesn't reach everyone and alternatives are poor.	Underserved (0.76)	Coutts' current connection likely will not support the growth in usage that appears to be coming.
Lethbridge County	Served (1.18)	In interviews, it seems people were more likely to pay slightly more for faster internet. However, providers were often limited in reaching most of the population.	Underserved (0.86)	Utilization of mobility options has been a good alternative for Lethbridge County. As demand increases this may no longer be an effective option.
Lomond	Served (1.61)	The village of Lomond benefits from having access to local WISPs. Based on the interview we determined that the community is served for their needs.	Served (1.17)	As the village starts to use more and more broadband they will need to increase their available speeds to stay competitive.
Magrath	Fibre (22.06)	Well serviced with broadband internet, they also have Axia in their community.	Fibre (16.09)	With fibre technology, the community is well served going into the future.
Milk River	Served (1.03)	The town of Milk River is served, and has a few flexible options. Their index score is lower than expected due to the high cost of their top available internet packages.	Underserved (0.76)	As demand increases for broadband the cost for the top end packages will need to be more approachable for the mass market.
Milo	Served (1.69)	Milo is relying heavily on a local entrepreneur's WISP. Encouraging new business use with the VBDS should help.	Served (1.23)	If they are successful in attracting young businesses they will need to develop their internet speed further.

	Classification (present)	Note(s)	Classification (Year 2 projection)	Note(s)
Nobleford	Fibre (22.06)	The village of Nobleford is equipped with Axia's fibre network. Current market packages do not fully utilize the technology, but offer more than enough.	Fibre (16.09)	The village of Nobleford will be serviced regarding internet connectivity for quite some time thanks to fibre technology.
Picture Butte	Served (22.06)	Picture Bute like other communities has access to a fast broadband connection through Shaw. Even though the community does not have Fibre, they are currently served.	Served (16.09)	Based on the information gathered during the interview the community should be well served for the next while.
Raymond	Fibre (22.06)	Well serviced for broadband internet, they also have Axia in their community.	Fibre (16.09)	With fibre technology, the community is well served going into the future.
Stirling	Fibre (22.06)	The village of Stirling is equipped with Axia's fibre network. The available packages do not fully utilize the maximum capability of the product, but handle the current needs very well. Approximately 60% of the community is believed to be using Axia's service.	Fibre (16.09)	The village of Stirling will be serviced for a long while to come. As the current market options become too slow, Axia will further tap into the potential of their fibre network.
Taber	Fibre (20.56)	The town of Taber will be future ready with the available fibre network from Telus. It will handle a lot more traffic then what is currently sent its way.	Fibre (15.02)	Due to the capabilities of Fibre, this index number will be significantly higher as Telus offers a larger internet package in the future.
Taber, MD of	Served (1.40)	It appears the area is willing to spend slightly more, increasing the number of people with higher tiered internet packages.	Served (1.02)	Based on the information we have this community will be barely served in 2 years.

	Classification (present)	Note(s)	Classification (Year 2 projection)	Note(s)
Vauxhall	Served (1.07)	Based on the sample size we have of Vauxhall some appear to be big internet users, but are limited to outdated options from Telus and wireless technology that cannot currently hit speeds required.	Underserved (0.78)	Vauxhall does appear to have a decent ISP. However, based on the interview they appear to need a faster option soon.
Vulcan	Fibre (12.86)	Vulcan has an Axia fibre network, and this community identifies as a tech savvy place to live. From our observations, they use more than average data.	Fibre (9.38)	Vulcan is well positioned for the future. As demand goes up Axia can tap further into the capability of Fibre technology and fill demand.
Vulcan County	Served (1.35)	Some WISP services are available but not covering the entire region. More detailed data is needed to provide an accurate measuring.	Underserved (0.99)	Speed increases, range, and reliability increases will help the WISPs of Vulcan county.
Warner	Served (1.40)	Based on ISP advertised, availability and rates, Warner should be serviced well, however in our interview access did not seem to be that way. More in-depth primary research is needed	Served (1.02)	The available rates should be sufficient. However, if network reliability is still a considerable issue, the service level will decrease rapidly. More data is required.
Warner County	Served (1.84)	More detailed information is needed to give an accurate measurement. Although reach of some WISPs is not perfectly defined, most of the county appears served.	Served (1.34)	The country appears to be served and should remain this way for the near future, eventually network speed will need to increase.

Assessing the SouthGrow Region

Just how fast does internet need to be?

The following table provides some perspective on the requirements for internet access in these everyday tasks. The potentially world changing elements of the internet come into play with real-time communication across large distances, and a consistent 10mbps internet speed (upload and download) is considered sufficient for today's video conferencing/telecommunicating. However, as picture quality and standards increase so do file size requirements.

	Downloading an e-book	15 IPhone photos	Downloading a (1hr) HD-Movie
1mbps	30-seconds	6-minutes	260-minutes
5mbps	5-seconds	1.2-minutes	52-minutes
10mbps	3-seconds	39-seconds	26-minutes
25mbps	1.2- seconds	14.4-seconds	10.5-minutes
50mbps	<1 second	7.2 seconds	5-minutes

***This indicates the download time for the relative file sizes, actual time can vary depending on the reliability of a connection, technology of the device, and equipment grades in the home.*

In most cases the 10-mbps is sufficient to see much of the benefits from broadband internet. While 25mbps is more than enough for modern families to fully utilize the internet, it also seems to be enough of a package that many residents will not pay any additional costs to get speeds greater than 25mbps.

Internet usage escalates quickly with multiple devices. As each household is paying for Internet access, the connected devices are sharing the purchased bandwidth. If 5 separate Internet users in a house are all streaming HD-video content, each user would experience 5-mbps (5 users * 5mbps = 25mbps total).

Collecting more accurate and more useful information

Stages of Broadband access and development within the SouthGrow Region vary by community. SouthGrow community leaders generally express a desire for faster and more reliable Internet to help the community grow and prosper. However, not all communities have done complete assessments to determine their position on the matter. Whether aiming for a publicly managed utility or privately created network, each community needs to completely understand the position of their residents to project future needs of the community, create a business case for investment, and classify themselves as underserved.

A mass collaborative effort to collect this information could be undertaken. Leveraging services such as Ookla's speed test (http://www.speedtest.net/) on a town, region, province, or nation wide digital poll would collect mass amounts of data on access, speeds, Internet service provider and potential demand for better Internet connectivity. Initiatives on a federal level have been initiated, but could be slow, and communities might not have access to all the relevant data.

Additionally, market research via surveys or face-to-face engagements directly with consumers could be undertaken.

Choosing the most appropriate broadband solution

In most cases a privately-owned fibre network is the best option from a performance perspective. As costs for developing a network can be incredibly expensive, making a business case fits more into the role of community economic development than operation of an Internet network. Publicly owned networks can be a good solution for net neutrality and making it very accessible cost wise, but maintaining reliability, security and service can be more than most municipal offices are prepared for. However, if the business case is risky, it could be difficult to get this Internet model to move in. From here, communities need to decide which solution fits their needs best.

Public vs Private

Various portions of a network can be publicly owned and operated, however most ISPs have high standards of equipment and network deployment and will not use systems they did not install themselves. Whether public or private, the standards of network implementation (especially with Fibre) should not be an area for cost saving shortcuts. Instead of shortcuts, considering policies that allow for services to split the cost of trenching at any given time, such as a one dig policy, is a good idea.

	Private (Large)	Private (Small)	Public
Pros	• Low community capital investment • No maintenance costs	• Lower community investment cost • Not responsible for maintenance • Local Business/Money stays local	• Potential revenue source • Control of quality and speeds
Cons	• Little Control of the network • Little control of future development • Rarely services 100% of population • No control of pricing • No control of internet throttling/capping	• Less Start-up capital – may need assistance from community. • Less control of Pricing and market options • Little control of future development	• Expensive to install • Higher risk of failure • Managing network issues and IT related issues (not always related to the ISP) • New technologies could render the network useless • Responsible to Quality and Speeds

Network Options

Fibre is the best network option; however high costs make implementing a fibre network unrealistic for many cases without a dense population or private investment. The main cost of a fibre network is in the placement of the conduit. Trenching or mounting the conduit on power poles has been reported to account for most of the costs. New technology in this area is very focused on making it easier to lay the fibre conduit, but hasn't yielded a significant enough difference to make the technology widely available.

Wireless has been significantly more approachable, but the technology has limitations. Line of sight to broadcast points need to be maintained, making it unreliable in some geographical locations. Wireless technology has made significant improvements in recent years though, and current technology will be viable for the near future. These networks require upgrading in the future as demand increases and existing antennas cap out.

	Wireless	Fibre
Pros	• Affordable over longer distances (without obstructions, 3-25miles range)	• Incredible Internet Speeds • Considerably more "future proof"
Cons	• Unreliable in extreme weather • Will be replaced in 2-5 years • Geographical obstructions can make impossible	• Expensive • Under-utilized

Other options are available, though are less recommended for community endorsement or long term Internet solutions on a community scale.

	Satellite	Mobility	Cable
Pros	• Reaches almost everyone	• Reaches almost everyone • Less initial cost for a consumer (low/no install cost)	• Occasionally, already installed/available
Cons	• Expensive • Is rarely upgraded • Speeds are low in comparison to other high-speed broadband options.	• Difficult to manage multiple devices (Weak for IoT) • Low data caps • Speeds are low in comparison to other high-speed broadband options.	• Been replaced with fibre technology.

Recommended Paths Forward

It is apparent that for most communities in the SouthGrow Region, the path forward is to continue to try and attract investment by private ISP's in their municipalities, both for infrastructure and provision of services. The cost of doing these activities is significant, and requires expertise and focus that can shift resources away from other goals and areas of priority for the community. Most SouthGrow municipalities have made this assessment, either formally and backed by research, or informally, and are proceeding in the knowledge that private ISP's will be the key to Internet service provision for their residents.

In some cases, such as the MD of Taber and Cardston County, decisions have been made to make investment of municipal dollars and resources to aid and/or build infrastructure to improve Internet access. Again, assessments were made to come to these decisions, but in these cases, Councils' recognized that the business case for investment of upgraded Internet services could not be made, and thus improvement would not happen solely through private industry investment.

It is important for all SouthGrow municipalities to monitor the ever-changing demand for broadband connectivity in their communities, and create an environment where investment of infrastructure can be successfully utilized. Understanding how to maximize Internet within the community will be an ongoing task. Positioning communities to make the most of their technological assets will be the key to creating success from the investments of broadband connectivity, be they from private ISP's or the municipality itself.

Therefore, several next steps are recommended for SouthGrow communities. These steps are aimed at creating the best possible environment for Internet services attraction and operation to be successful.

In addition to a group of steps that all communities should take, regardless of their level of access and connectivity, additional suggestions are made for communities within each segment of fibre, served and underserved.

Next Steps

Next steps are suggested in no particular order, and are intended for communities to asses which actions are the best fit for the community at specific times. Municipalities should not attempt to perform all steps at once. Rather, they should select an action to start with and the evaluate the results.

All Communities

1. Consider having a community centre, such as the library, provide materials and educational resources on the subject of how to better utilize Internet. Introduce residents to the terminology of internet usage and the difference between options. Communicate new options through the Internet of Things, and show how connectivity can improve quality of life for both residents and businesses.
2. Consider use of an Intelligent Community platform to engage in planning for integrated use of technology and connectivity to support the broader strategic goals of the community, and to maximize the capabilities of the Internet access and connectivity available. Also use this process to identify and assess gaps.
3. Consider forming or maintaining a broadband committee, comprised mainly of community broadband champions, to help forecast opportunities and guide maximum use and benefits from Internet connectivity.

4. Monitor and measure Internet Use. Conduct surveys, interviews and/or use the broadband index.
5. Stay in communication with ISPs to encourage installation of Internet infrastructure into areas of new development pre-development.
6. Develop policies that encourage best practices related to installation of Internet infrastructure and related technologies, such as a one dig policy.

Fibre Communities

1. Promote the asset of being a fibre community in all municipal economic development endeavours and communications.
2. Develop a technology communication strategy with services that support new residents and businesses in the community, such as realtors, to ensure they are aware of the benefits of being a fibre community and are promoting such in the same way and language as the municipality.
3. Maintain and expand a broadband committee, seeking membership from champions aiming to best use fibre (compared to a broadband committee that aimed to attain fibre).

Served & Underserved Communities

1. Be investment ready. Use community assets and business and residential growth potential to make a strong case to Internet providers on the health of the community, and opportunity for increased Internet access.
2. Plan for when a fiber network will be required, based on usage growth. If there are too many options in the community there may not be enough market share for any single company to develop a full fibre network. If there are too few market options the private company may not be motivated to innovate.
3. Launch community engagement seminars or pilot Internet-based events utilizing SuperNet access to demonstrate what people are missing. Encourage additional usage and create a common place for communication on the topic with the community.
4. Attend ISP conferences and events. Meet with ISP's and invite them to hold events in your community. Keep your community top of mind with ISP's and develop the potential for investment opportunities.
5. Determine actual demand for Internet options with tangible and quantifiable data. Use interviews and surveys, and share the results with ISP's to show that your community is motivated to create a solution. Conducting primary research and collecting real feedback also allows residents to feel progress towards a better option.
6. Communicate with SouthGrow and other communities that have a local Internet option. Discuss questions pertaining to broadband in the community and develop insights as to the development of other networks.
7. Seek and develop local champions. Champions, either individuals or community groups, can work with ISPs or create their own ISP and service the community.

Elements of Success

Throughout the SouthGrow region, there are elements common to communities experiencing success in the attraction of fibre investment and/or upgrades by ISP's. These elements also appear to affect other areas important to creating sustainable, vibrant communities, such as successful economic development and a high quality of life for residents. The elements common to communities succeeding in these areas are described below.

Planning

Municipalities who have engaged in planning processes tended to have a clear understanding of their priorities, and criteria against which decisions are made. These municipalities have assessed several factors specific to their community including:

While attaining high-speed broadband connectivity was not always identified as a priority by these communities, the very fact that they had gone through a planning process that allowed Council and administration to understand community needs, and plan for the future, put these municipalities in a better position to recognize and act on opportunities.

Positioning

Each community has elements that make it unique. These span the range from physical community features and amenities, to intrinsic community culture and values. Municipalities who have spent time identifying what makes their community unique were better able to promote themselves for investment of upgraded Internet services and/or fibre installation.

Positioning relates to planning. Each requires the community to take an honest look at itself and identify core strengths and areas of opportunity. Honesty is a key element if the process though. Positioning only works for a community if it is based in fact, and if helps the community to distinguish itself from the other communities in the region.

It is noteworthy that a number of SouthGrow communities have developed their positioning based on an honest review of what the community is, and what it wants to be in the future. For example, attracting industrial or commercial development is traditionally viewed as a core economic development activity that all communities do. However, some SouthGrow members have chosen to focus efforts on encouraging home-based businesses instead, resulting from assessments that showed lack of industrial space in the community, or that residents preferred the municipality focus on quality of life infrastructure rather than infrastructure required to attract industrial development. The resulting positioning helps these municipalities attract investment to support that community's vision, including connectivity.

Investment Ready

"Investment ready" is a broad term, but in this context it speaks to doing everything possible to make a community a good investment for an ISP. The SouthGrow communities who took this approach were successful in attaining high-speed broadband connectivity.

Being investment ready starts with an attitude that welcomes and encourages investment. The communities that do this well look at an opportunity and their community from the perspective of the investor, and will ask the question: "What can be done to make it easy for the investor to say yes to my community?" Some of the answers to that question are:

- Have a clear, simple and timely process for agreements, approvals, easements, right of ways, line assessments, bond waivers, permits, etc.
- Provide needed information to the investor accurately and quickly.
- Have clear priorities and goals for the community, and be able to connect these to the investment being sought. For example - why does the community want high-speed broadband and how does the investment support community goals and plans?
- Actively facilitate support from the community for the investment. For example - If 30% of the community must sign up to express interest for the investment, do everything that can be done to make that happen. Don't wait for residents to make it a priority on their own.
- Exceed expectations. For example - Secure 40% or 50% of the community on the interest sign up. Provide all needed information a week faster than the deadline. Invite the investor to community events and give them positive attention.

In addition to having an attitude that welcomes investment, communities need to look at the financial or business case and think about what they can do to take away as much risk for the investor as possible, without putting the community at risk. This could include efforts such as providing space within the community for activities, storage or construction, or providing access to municipal infrastructure (towers), at a low cost or no cost. Asking the investor directly what they need to be successful in that community will generate ideas that can be discussed, and allow the municipality to determine if and where they can offer solutions.

Being investment ready distinguishes which communities are likely to appreciate the investment and contribute to its long-term success. This element makes a big difference to the companies who are selecting which communities they will spend money in.

Community Champions

Community champions were recognized as the lifeblood of most communities. Champions could be individuals, agricultural societies, business associations, service groups, and more. These groups were the instigators of community events, fundraising for recreational facilities, and now are also seen as key allies in advocating for high-speed broadband connectivity.

Most broadband champions started as individuals who were early adaptors of technology, and wanted high-speed broadband connectivity for specific uses in the community. However, as the potential that connectivity offers became better understood, community groups have become great partners to help attract investment and make the most of it. For example, some SouthGrow communities are developing business centres or hubs to provide a variety of business support services in their community. Many of these services are focused on using technology and connectivity to allow businesses located in small, rural municipalities to compete with businesses located in larger centres. Community business associations and agricultural societies are key partners to these initiatives, thus becoming champions for use of technology and connectivity to support community growth and development in much the same manner that these groups traditionally organize community rodeos, or fundraise for local pools and arenas.

Other champions to emerge may seem unexpected at first. For example, as some SouthGrow communities worked to secure 30% or more of their residents' signatures to indicate interest to Axia for fibre installation, individuals would learn about the opportunities that fibre could offer and become champions of the project. In one community, an employee of Family & Community Support Services (FSCC) set up her laptop so that as mothers came to her facility for the regular services she provided, she could explain the Axia opportunity to them and help them sign up.

Developing broadband champions in different segments of the community helps to illustrate how connectivity supports all parts of a community, and contributes to a better quality of life for all residents. Empowering these champions to take leadership roles in the community toward attracting and using high-speed broadband also gives greater credibility to its potential.

Proactive, Hands-On Involvement & Communication

Municipalities who took a proactive, hand-on approach to attracting investment were more successful than those who did not. These municipalities viewed investment as a good thing, and were not afraid to been seen advocating in favour of private industry. Traditionally this might be better understood in terms of attracting a food processing facility to the community, or securing a financial contribution from a large entity towards construction of a recreational facility. Municipalities who could take the same approach and philosophy to enticing investment of high-speed broadband capacity into the community experienced greater success.

An interesting observation is that these communities also had greater clarity of their goals towards attaining high-speed broadband connectivity. Many had assessed why they wanted to acquire high-speed broadband, and had analysed to some degree the costs of paying for the infrastructure and operations as a municipality compared to a private company doing so. In these cases, Council and Administration saw their role as facilitators of service provision for the community, and therefore could justify courting private industry because this provided the greatest opportunity to obtain high-speed broadband services.

Proactive, hands-on involvement by Council and Administration took many forms, such as:

- Asking ISP's to expand services or invest in the community.
- Inviting ISP's to Council and public meetings.
- Passing motions to make broadband connectivity a priority, endorsing ISP's as they tried to gain sufficient interest from residents, giving specific directives toward attaining investment of fibre, etc.
- Communicating with residents about potential broadband investment through mail outs, posters, social media, at community events, hosting community meetings, and even going door-to-door to talk to residents directly.
- Setting up locations where residents could get more information and sign interest forms.
- Facilitating agreements such as right of ways, easements, access agreements and more.

Regional Cooperation and Collaboration

Regional cooperation and collaboration is the least likely of the above factors to indicate successful attraction of high-speed broadband investment in a community. In fact, a number of communities who participate in regional initiatives have not been successful in attaining high-speed broadband. However, this element is included as a potential factor for success because when done well, regional collaboration and cooperation helps facilitate a culture where communities support regional success almost as much as they advocate for individual success. By adopting an attitude that believes that everyone should be successful, these communities attract opportunities, as well as champions to make them work.

Furthermore, these communities have a better understanding of the bigger picture, and their community's potential within it. They tend to understand their strengths and weaknesses, and how to best position the community. In cases where the community may not have the resources or skills within administration to develop positioning, or conduct thorough assessments, these efforts are often assisted by the regional collaboration. Finally, the Regional group may have a strategic plan or set of priorities for the area, or active programs designed to support the member communities. All of these are assets that can help municipalities create an environment to attract broadband investment.

Elements that Discourage Success

Conversely, there are elements demonstrated throughout the SouthGrow region that prevent success in attaining high-speed broadband connectivity and/or supporting sustainable community economic development and quality of life initiatives. Some of the barriers to attracting broadband investment are described below.

Lack of Planning

Municipalities without formal plans and priorities appear to have less ability to identify what is important to residents, and to seize opportunities. While they may focus on maintenance of core infrastructure, the ability to innovate, grow and attract investment into the community is limited because it is unclear what these look like for the community. This leads to frustration on all ends and eventually, stagnation.

Lack of Clear Identity

Positioning is more than having a statement to use to promote the community. It also helps the community understand itself and how it is unique. Municipalities that could not offer a clear description of how the community positions itself make it difficult for an outsider to recognize the uniqueness and/or value of the community. This affects desire to invest in the community.

Further to lack of identity, a number of municipalities in the SouthGrow region articulated positioning that was nearly identical to each other. For example, all SouthGrow municipalities are small, rural communities that offer a variety of recreational amenities. While this is true, it's like saying that all SouthGrow communities have running water. That is not a defining characteristic, it is a basic expectation.

The result of a municipality being unable to offer a clear description of its identity, or offering a generic description, are the same. It appears to the outsider that the community has not made the effort to assess itself and identify its strengths. This perception makes the community less appealing as an option for business development or investment.

Reactive Leadership

Municipalities that took the approach of reacting to opportunities rather than seeking them out appear less likely to attract high-speed broadband investment. Examples of this within the SouthGrow region could be seen in communities that were slow to mobilize support, reluctant to have Council endorse opportunities with formal motions or directives to Administration, and who provided limited communication to residents about opportunities without actively promoting these through face-to-face encounters or social media on behalf of the municipality.

Poor Communication

There were two types of communication breakdowns that appear to contribute to less success in attaining high-speed broadband connectivity. These are communications from the municipality and champions to the community, and communications with the municipal structure.

As referenced above, communication to the community from the municipality and champions was most successful when it was targeted, relevant and active. Communities that simply sent out information without follow up and face-to-face encouragement did not fare as well as communities who engaged in conversations in the community, at community events, and through responsive social media.

Some municipalities showed challenges in having clear and consistent understanding of core priorities and plans amongst all Council and staff. In cases where this occurs, the potential for conflicting information and inconsistent communication is high, both of which can undermine engagement of citizens and ISP's.

Not Investment Ready

Combining the above factors within a community results in it being not investment ready. While being investment ready requires additional elements as well, without addressing the above, a community does not have a solid base from which investment attraction can start.

The challenge is that it appears some SouthGrow communities do not recognize that they are not investment ready, or why. There are many factors that contribute to this, from lack of resources, to core infrastructure challenges that demand the full attention of Council and Administration.

Additionally, communities who do not appreciate factors of importance to investors can create situations that damage the relationship, cause undue stress, and cost additional dollars for the investor. This can hurt the project at hand, and serve to scare the investor away from making additional investments toward Internet access in other SouthGrow communities. It is critical that all municipalities attempt to put their best efforts forward so not to lose opportunities for neighbouring communities.

Other Elements to Consider

Education

In every SouthGrow community there is a broad range in the level of awareness and understanding related to the potential for technologies and high-speed broadband connectivity. Ongoing education for residents would be helpful in establishing a foundation of knowledge and skill to assist communities in maximizing use of technology. This could include topics related to economic development, health care, communications and entertainment, such as:

- Use of social media and other communication platforms (Skype, FaceTime, etc.)
- Using Internet for home phone and television options
- Standards business tools available online such as accounting, point of sales programs, and inventory control
- Use of emerging health care and safe home devices such as monitors (heart rate, oxygen, etc.), in-home cameras, doorbell cameras, air quality detectors, and more.

Additionally, many citizens do not have the base understanding to be able to properly assess their Internet access options. For example, in many communities a simple price comparison often determines which Internet package residents will choose, without understanding the differences between the speeds and delivery methods of each provider. Helping residents understand the basic components of connectivity, so that they can compare choices accurately, may alleviate some of the frustrations that discourage use of technology that could improve quality of life for residents.

Funding Broadband Infrastructure

Many SouthGrow communities have assessed the potential for funding broadband infrastructure within their communities and have determined that it is not feasible to self-fund such an investment at this time. While the cost of fibre is decreasing, and much work is being done by private industry to find ways of decreasing installation costs, the average SouthGrow community would still be looking at millions of dollars to move forward on their own.

A few funding programs have been announced by the federal government, namely a $750 million fund announced by the CRTC, and the $500 million Connect to Innovate Program through Innovation, Science and Economic Development Canada. While these seem like large numbers, these programs are meant for the entire country and span a period of 5 years.

Thus, at present, the best opportunity for most SouthGrow communities to attain high-speed broadband connectivity is to work with ISP's and attract their investment.

Ongoing Innovation of Non-Fibre Solutions

While fibre optic cable is recognized as the only current future proof broadband technology, advancements and improvements in wireless and mobility options are providing a range of choices for communities who may not be a good business case for fibre installation at this time.

Recommendations for SouthGrow

Provide Investment-Ready Support

SouthGrow could play a vital role in assisting its member communities to attract upgraded Internet access and high-speed broadband connectivity by helping them develop the capacity to be investment ready. This could include:

- Identifying community assets
- Developing unique, strength-based positioning
- Engaging in strategic planning
- Identifying community priorities
- Adopting a proactive, innovative culture
- Streamlining processes and procedures to assist enterprise in choosing that community
- Identifying processes that would allow the municipality to mobilize quickly and take advantage of opportunities for investment
- Assessing the community from a investor's perspective / answering the question why an enterprise would choose that community over another community
- Identifying qualities unique to each community that would provide incentive for investment

Facilitate Communication

SouthGrow is in an ideal position to facilitate communication amongst communities, and with ISP's, toward attaining greater broadband connectivity for the region.

Regular communications with SouthGrow communities to discuss issues and opportunities related to broadband and technology development is recommended. A quarterly or semi-annual approach with standardized questions would provide SouthGrow with a baseline from which to measure progress, and allow for monitoring of unique situations. This would also allow SouthGrow to connect communities with like challenges, or who could provide support to each other in navigating new situations.

Regular communication with ISP's operating in the SouthGrow region would provide valuable insights into the needs of these providers, and their plans for upgrades and expansions. It is critical that conditions for success for these ISP's are facilitated as much as possible, especially in the smaller, more remote communities within the SouthGrow Region, so that access to reliable, quality Internet services are not interrupted. Regular quarterly or semi-annual communication with these providers will serve to identify challenges and opportunities in a timeframe where SouthGrow can determine if its assistance would be helpful.

Be an Information Hub for Best Practices

SouthGrow is the ideal hub for information about best practices for communities to use in engaging with their citizens, and encouraging broadband attraction and use. Examples of information SouthGrow can acquire and share include:

- How to effectively engage your community in discussions about attaining high-speed broadband - Best practices from successful SouthGrow communities.
- Education strategies to maximize community and municipal use of high-speed broadband connectivity.
- How to incorporate technology and high-speed broadband connectivity into strategic planning - The Intelligent Communities model.
- Elements to consider when trying to attract investment of high-speed Broadband into your community. Investment readiness specific to connectivity, and examples from successful SouthGrow communities (contract negotiations, steps taken, etc.)

SouthGrow could develop digital files that speak to these topics, as well as offer annual workshops or a semi-annual training event or conference from which to share information.

Additionally, some ISP's have expressed interest in assisting SouthGrow with developing these resources. There is specific interest in creating a playbook for different sized communities on how to maximize their use of technology and create the greatest return on investment.

Finally, SouthGrow could work with centres that provide business supports in communities, both existing and planned, to assist with education to increase community competency related to technology and connectivity. This includes all the elements listed under Education in the section above, and also considers the potential for assisting additional ISP's in developing.

Facilitate Regional Collaboration & Promotion

SouthGrow already serves to facilitate regional collaboration, while advocating for opportunities for member communities. SouthGrow may be able to play a bigger role though through the communication efforts detailed above, and by working to develop a bigger picture, broadband strategy that aligns with Alberta Southwest and Lethbridge. Such a strategy could consider larger scale opportunities, such as leveraging the various community based business and innovation centres to support regional growth, or working to develop an Internet Exchange south of Calgary.

SouthGrow should also continue to represent the region in submissions to the CRTC, and provide information and corrections to Innovation, Science and Economic Development, specifically related to the map they developed of Areas Eligible for Funding to Enhance Broadband Access.

Ongoing Research

The parameters of this project did not allow for the time or resources to conduct robust research into a multitude of areas. For example, greater engagement with citizens and business owners would provide a much better understanding of the needs and wants for the region. Sectors such as agriculture have a tremendous amount of new technology and related considerations that could not be encompassed in this report. Additionally, as emerging technologies become more established, secondary data should become available that can assist in better quantifying the value of high-speed broadband connectivity, and best options for communities to consider for the future. Finally, tools are currently being tested, such as Internet speed tests (performance.cira.ca), that SouthGrow could gain access to.

Plans for ongoing research, to be conducted at regular intervals, should be considered.

Appendix

SouthGrow Broadband Project Secondary Research

Community Reports

SouthGrow Broadband Summit Event Outline