BIG LAKES COUNTY

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November 7, 2017

Mr. Earl Dreeshen, MP
The House of Commons
Vice-Chair Standing Committee on Industry,
Science and Technology

RE: Broadband Connectivity in Rural Canada

Dear Mr. Earl Dreeshen,

On behalf of Big Lakes County, we are pleased to present you with our municipality's brief on rural broadband connectivity to the Standing Committee on Industry, Science and Technology.

Our mission statement emphasizes Big Lakes County's devotion to enhancing our region by encouraging responsible development. This means investing in core services like infrastructure, and in recent years, we have come to understand Broadband as critical infrastructure for our rural population. We strive towards sustainability, and we know that rural communities that thrive are those that are connected.

Thank you for taking the time by addressing the prevalent concern of rural broadband connectivity, and please contact us if you have any questions about our document.

Kind regards,

Roy Brideau, CLGM
Chief Administrative Officer, Big Lakes County

cc. Big Lakes County Council
Steve Eppley, Broadband Discovery Project Manager

Submission:
Standing Committee on Industry, Science and Technology
Rural Broadband Connectivity

PURPOSE

The purpose of this brief is to inform the Standing Committee of prevalent connectivity challenges and Big Lakes County and neighbouring municipality's current initiatives to assess and possibly enhance internet connectivity through our Intermunicipal Broadband Discovery Project.

Current Situation

What Constitutes Acceptable High-Speed Service?

- The Canadian Radio-television and Telecommunications Commission (CRTC) has set broadband internet[1] target speeds of 50 Mbps download/10 Mbps upload.[2] Beforehand, CRTC maintained a recommended minimum broadband at 5 Mb/s down and 1 Mb/s up.[3] This speed (in comparison to leading countries) was not enough to compete in the developed world of information technology. The FCM 2014 Broadband access in rural Canada study shows examples of international targets for bandwidth that indicates optimal download targets of **100 Mb/s** – while conceding that the minimum 5 Mb/s target speed was "relatively low."[4]
- Average speeds in the Big Lakes County, Alberta region are only 1 Mbps download/1 Mbps upload (or much less).[5] The below image (Fig. 1) shows advertised offerings of speed. [6]

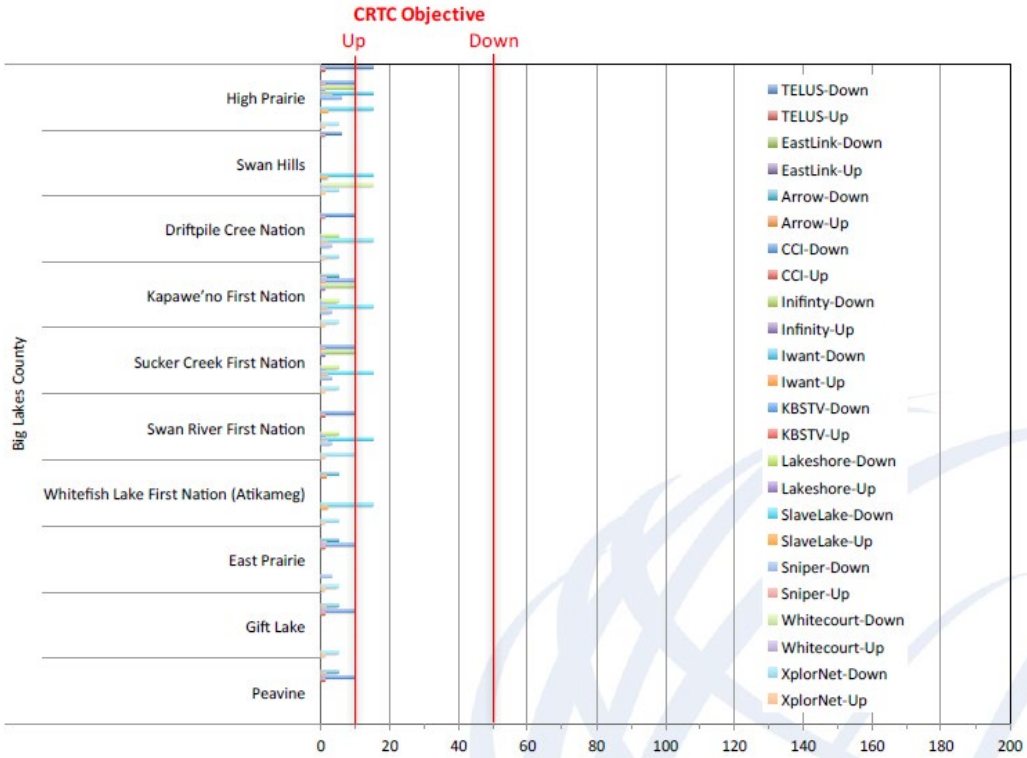

Fig. 1 **Maximum Advertised Residential Wireline Offering – Mb/s**

- Current speeds make it difficult to attract and retain businesses, residents, and visitors. Limited and unreliable Internet access is equivalent to inadequate roads, electricity, or water.
- In 2016, a ruling by the CRTC identified broadband a "basic telecommunication service."[7]

The Intermunicipal BroadBand Discovery Project[8]

- Due to the above-mentioned considerations (among others), Big Lakes County successfully applied for $180,850 of funding from the Municipal Affairs Alberta Community Partnership (ACP) grant towards their proposed Intermunicipal Broadband Discovery Project.
- The **Intermunicipal Broadband Discovery Project** (2017-2019) is a collaborative initiative that aims to enhance internet access and capacity for all partners in the region. The project will work with the results of the Northern Alberta Development Council (NADC) **Regional Broadband & Digital Connectivity Investigations** study, as well as information gathered from stakeholders in each partner community, to produce options for a regional business case and possible service framework. By spring 2018, partners will be in a better position to make informed decisions regarding investments in critical broadband infrastructure.
- Partners in the project to date are Big Lakes County, Lesser Slave River County; the Towns of High Prairie, Swan Hills, and Slave Lake; Saw Ridge First Nation; and Gift Lake Métis Settlement. Prospective partners include Sucker Creek First Nation, Driftpile First Nation, Swan River First Nation, Kapaweno First Nation, Atikameg First Nation, East Prairie Métis Settlement, and Peavine Métis Settlement.
- A manager and an advisor with networking expertise lead the project – with further assistance from a specially appointed technical committee.

The Financial Challenges of Implementing High Speed Service?

Fibre and Broadband Infrastructure: Alberta SuperNet

- Laying down fibre infrastructure furthers broadband (connectivity) sustainability.
- Optical fibre can (unlike other broadband connections) transmit symmetrical upload and download speeds; and Corning, an optical fibre manufacturer, notes that current fibre can transmit data up to speeds of 10 Terabits per second (Tbps) (10,000,000 Mbps). [9] Once capital costs (deployment) are paid, fibre is less costly to maintain in the long-term. Many estimates suggest an operational lifespan beyond 50 years . [10]
- Two access models deliver broadband services: infrastructure or services-based competition. In services-based, internet service providers (ISPs) leverage common physical infrastructure to deliver broadband services; predicated on open access networks that provide fair and non-discriminatory access.[11]
- Conceived as an open access network, the Government of Alberta developed SuperNet to connect civic service buildings. Essentially, SuperNet (managed by Axia) is a primary network that communities and ISPs use and provides backhaul (middle-mile) fibre connectivity services. In 429 communities there are 3,300 buildings connected to this network. [12]

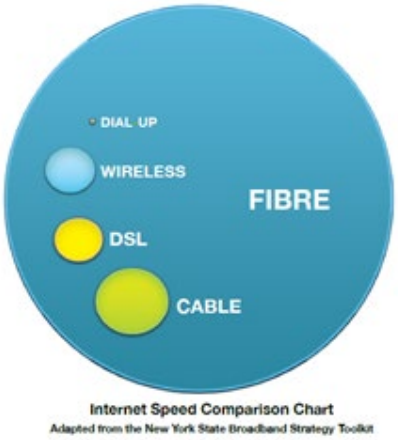

Figure 2: Taken from Understanding Community Broadband: The Alberta Broadband Toolkit

- However, SuperNet is cost-prohibitive for rural/remote municipalities that cannot afford to connect. Thus, municipalities are discouraged from signing long-term agreements; a "solution" deemed easy where there is often a lack of technical expertise. [13]
- Supernet and Telus fibre can support future community-based broadband build-outs.[14] In Alberta, SuperNet could play a key role in providing ISPs wholesale (open) access to middle-mile infrastructure to link internet sources with terrestrial-based satellite gateways.[15]
- Affordable wholesale access to fibre network is critical to providing economical (and sustainable) high-speed broadband services; but, it is non-existent.

The Rural Problem: Considerations regarding Cost/Affordability/Reliability

- Rural communities face logistics problems installing fiber-optic cable in sparsely populated areas. Infrastructure and installing is costly – especially over large (rugged) landmasses. Challenging terrain issues and weather often justify higher prices. [16]
- Thus, most rural community organizations and small business do not have the capacity (or capital) to build the expensive infrastructure needed to improve services.

If ISPs do operate in rural areas, they tend to offer lower speeds and expensive bandwidth.

- Big Lakes County currently pays $750/month for 10mb/s upload and download speed.
- This cost is higher than urban business. A business in Grande Prairie (approximately 200 kilometers away) with unlimited data and a speed of 15mb/s can pay $60/month. [17]
- Recently, Big Lakes County's Information Technology representative has been able to renegotiate a contract for100mb/s. Without this skillset, the County would continue to pay more than necessary.
- On top of a payment for internet service, Big Lakes County pays Axia $1245 for a connection to Supernet at the Big Lakes County Administrative Office - to connect to fibre instracture.
- Wireless internet providers have more network instability, as witnessed in Big Lakes County facilities. Please view the image below and note that each red line is a network outage in municipal facilities. Riverbend is a cellular connection deployed as an initial test of the connectivity. Kinuso and the Big Lakes County Head (Administrative) Office uses fibre ("Supernet" or Axia).

Name	Usage	Clients	Tags	Network type	Network health
Riverbend Plant	1.02 GB	1		Appliance	
Grouard Plant	87.8 MB	5		Appliance	
Joussard MSF	5.79 GB	17		Appliance	
Joussard Plant	2.54 GB	7		Appliance	
Kinuso Office	13.30 GB	12		Appliance	
High Prairie Airport - HPZ	1.50 GB	11		Combined	
High Prairie Head Office	2.10 TB	82		Combined	
Grouard MSF	2.9 MB	1		Appliance	
Faust MSF	2.52 GB	9		Appliance	
Kinuso MSF	1.24 GB	9		Appliance	
Enilda MSF	111.6 MB	3		Appliance	
High Prairie FCSS	110.7 MB	3		Appliance	
Faust Water Plant	24.12 GB	8		Appliance	

Figure 3: Provided by Big Lakes County Information Technology's network software

- Several fixed wireless ISPs serve the region, but coverage is sparse in some areas as is cellular service. Fixed wireless-based ISPs in the region include – Corridor Communications (CCI), Arrow Technology Group, Wispernet, XplorNet, and Lakeshore Internet.
- Access is not enough. Symmetrical speeds of 100 mb/s can keep rural municipalities on the map; allowing our communities to remain competitive.[18]

Enhanced broadband will help us sustain our region. Issues linked with lack of connectivity relate to loss of economic advancement and quality of life.

- For instance, telemedicine consultations could provide residents with more and better health care options – crucial in sparsely populated areas. Additionally, less connectivity means lack of access to educational opportunities and digital literacy.
- Improving internet connectivity became a priority for Big Lakes County when its Economic Development Authority attracted Plato Software Testing, an Indigenous software testing company, to the region. Plato considered locating to the area; however, inadequate connectivity and speeds meant the county missed a diversification opportunity.

Rural municipal concerns for implementation of new broadband infrastructure

- Lack of capacity (people and skill sets) to begin broadband initiatives.
- Few educational programs and specific opportunities for rural youth to train in ICT sector jobs.
- Financial constraints and maintaining taxation levels are prevalent municipal deterrents for becoming involved in broadband initiatives.
- Other critical infrastructure such as water, wastewater, and roads are aging and in need of repair, upgrading, or replacement. [19]

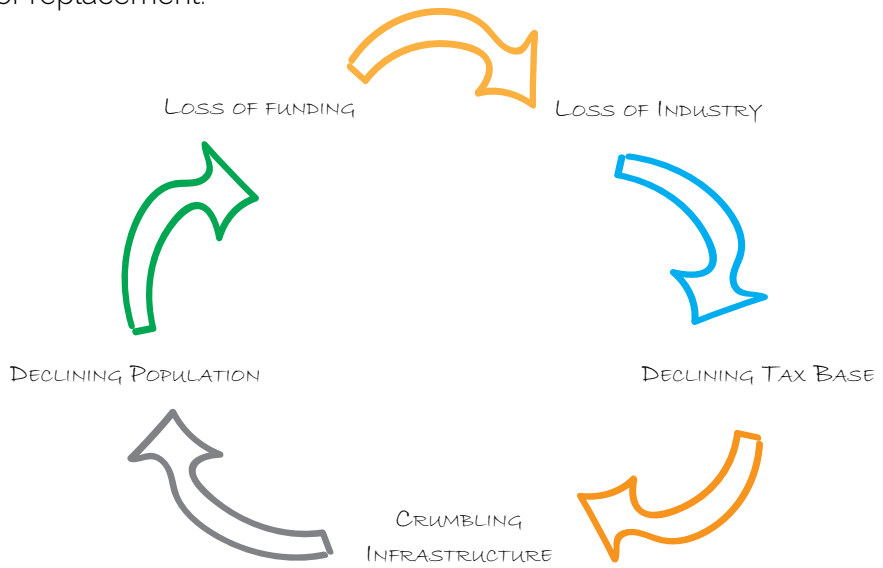

Figure 4 – Taken from Draft (2017 08 14) Northern Alberta Broadband Preparedness Project – Desired State (Fig. 1, p. 4).

Lack of Broadband Connectivity leads to loss of industry and the loss of the community's assessment/tax base needed to fund critical infrastructure projects. As infrastructure declines, residents move and the subsequent population decline translates into reduced core municipal grant funding (i.e., Municipal Sustainability Initiative (MSI)).

- A recent study estimates that rural communities experience about 25% worse connectivity compared to their urban counterparts. [21]
- For example, rural Canadian download and upload speeds were 14.8 Mbps and 6.0 Mbps compared to 19.8 Mbps and 7.7 Mbps in urban communities.[22]

In many instances (such as the above example), access does not mean affordability.

- For instance, an employee at Big Lakes County who lives 20 kilometers away from the Town of High Prairie cannot receive fixed wireless at her home. Instead, she pays an expensive phone bill of $250/month with an additional $75 fee for 6 GB of mobile data.
- TELUS' new Smart Hub for rural customers offers speeds of 12 Mb/s to 25 Mb/s download. Three monthly plans are available (two-year contract) - progressively more expensive as the GB monthly data usage increases.[23]
- While HUB technology is now available, it (like other wireless services in rural regions) is currently oversubscribed.[24]

Rural municipal Solutions:

Include making it easier for companies to build new network infrastructure. This could mean removing bureaucratic impediments to laying cable with new municipal infrastructure (for instance: roads or waterlines) or playing a larger role by helping to establish open-access fibre during other infrastructure work.[25]

- Establish a community or regional broadband network (with various possible models of ownership, governance, operation, and service provision, including laying fibre as basic infrastructure but leasing the network to a private party to provide the electronics, marketing, and retail services).[26]
- Incorporating fibre network requirements during local and regional planning.
- Seeking additional investment from incumbent services providers in urban centres.
- Support (and possibly subsidize) wireless Internet service providers.[27]

Please note that the above solutions would require more financial resources than most municipalities (including Big Lakes County) have.

Attitude Shift:

- Until recently, municipalities have not approached broadband as a public utility or service. Attitudes are shifting.
- Big Lakes County and its partners are striving to overcome geographical and financial barriers for improved services. Strengthening regional broadband connectivity is challenging. Our rural municipality may not have the funding power or capacity needed for a complex fiber initiative. However, we are currently working with technical experts to research a sustainable approach to enhancing broadband connectivity – and raising awareness of the benefits of that improved connectivity.
- The provincial government's encouragement through its partnership grant shows that rural areas are more likely to succeed when communities pool resources.

We note and thank various ministries at both the provincial and federal levels that are providing resources and funding to ISPs and municipalities.

- For instance, the Government of Alberta released Understanding Community Broadband – The Alberta Broadband Toolkit, in 2017.

Recommendations

Regulatory Changes to encourage implementation of high-speed service

The CRTC's decision in December 2016 to set broadband internet speeds of 50 Mbps download and 10 Mbps upload (with no data cap) and declare broadband as a "basic service" is a great stepping-stone; however, it is not a mandate.

- We recommend that this ruling be considered dynamically, with possible bi-annual reviews of target speeds. Technology is fast moving and our society needs to have the leeway to keep up.

The CRTC itself noted that fixing the gaps between urban and rural and remote broadband services will require "billions of dollars" of which the CRTC decision and new Connect to Innovate funding mechanism is only one part. [28]

- While noble in its aim, the ruling resulted in funding programs (such as Connect to Innovate funding) that are viewed as favouring existing major telecommunications companies.
- As the funding announcement and guidelines state: applicants must demonstrate experience deploying/operating broadband infrastructure.[29] This caveat may be a disappointment to those who working towards local civic networking initiatives and the belief that municipal government has a role in the provision of major infrastructure.
- Blanket eligibility criteria for programs designed at a national level can result in exclusion of important local projects.
- Criteria through the Connect to Innovate funding that show last-mile needs through hexagonal shapes. These shapes deny funding opportunities for extension of last-mile services in rural areas that are close to larger urban markets but, still, lack broadband target speeds.[30]

Regulatory changes to encourage its implementation should involve all levels of government considering whether broadband internet is truly a basic service, akin to landline telephone services, where all Canadians require access and there are similar funding mechanisms. [31]

We agree with the Canadian Cable Systems Alliance Inc that an effective way to make funding go far in rural regions is to examine programs not in terms of national funding (with blanket eligibility criteria and application processes) but, to direct resources to enabling local initiatives that work.[32] For instance, the Olds Alberta example and many localized initiatives (through public entities) have enhanced connectivity across Canada.

- Fibre infrastructure is optimal for sustaining enhanced broadband connectivity (and meeting any future target speeds), and municipalities across Canada can benefit from specific broadband funding mechanisms and expanded information sharing.

Today, wholesale access to fibre is not mandated. Neither are the wholesale rates for this access controlled. As a result, incumbents can deny access and charge higher prices. [33]

The CRTC ruling did not specify the cost to rural users these broadband targets had to meet. Localized projects begin because of insurmountable costs to residents and are consequently taking the potential cost and adoption of enhanced connectivity into account.

A recommendation put forward by Cybera is to have regulatory oversight for the practice of oversubscription and delivery of advertised download and upload speeds. We agree that ISPs should be required to provide consumers with guaranteed minimum speeds.[34]

- As seen in Figure 2, we witness the consequences of over-subscription throughout our municipal facilities.

General Description

- Big Lakes County is an Albertan municipality that stretches from south of the Town of Swan Hills, to the east of Grizzly Trail, north toward the Seal Lake region, and west of the Town of High Prairie. Included in its borders are five hamlets; in addition to surrounding neighbouring municipalities: two towns, three Métis Settlements and four First Nations communities. Our land and infrastructure impacts our neighbours and we would like to adapt to serve both our residents and region.
- True to its name, Big Lakes County has large water bodies and tributaries. It encompasses most of Lesser Slave (the largest accessible lake in Alberta), Snipe, and Winagami Lakes. Our unique (geographically large and sparsely populated) county also holds thousands acres of green zone – boreal forest.

Footnotes

1. For the purposes of this document, broadband means any high-speed Internet access that is always on and faster than traditional dial-up. According to the NADC draft study: broadband is defined as a wide bandwidth data transmission with an ability to simultaneously transport multiple signals and traffic types. The medium can be twisted-pair copper wiring, optical fibre, coaxial cable, or radio. Broadband service is characterized as offering symmetric bandwidth between 50 Mb/s and 1 gigabit (Gb/s)/1,000 Mb/s and higher (really unlimited bit rates).
2. Broadband connectivity is defined by various speeds measured in Megabits per second (Mb/s). Asymmetrical speeds (10 Mbps upload and 5 Mbps download) prioritize data consumption while symmetrical speeds (10 Mbps upload/download) ensure users can send and receive information at equal speeds, which is important for actions such as videoconferencing or uploading files.
3. While these speeds might address essential needs, they do not allow for economic development.
4. Federation of Canadian Municipalities. (2014). Broadband Access in Rural Canada: The role of connectivity in building vibrant communities. Website. Accessed November 2016, www.fcm.ca/Documents/reports/FCM/Broadband_Access_in_Rural_Canada_The_role_of_connectivity_in_building_vibrant_communities_EN.pdf
5. Taylor Warwick Consulting. Lesser Slave Lake Economic Alliance. LSLEA Broadband Discussion - High Prairie. November 23, 2016.
6. McNally, Michael Dr. Van Horne Institute: Digital Futures. Analysis of Basic Services Objective from the December 21, 2016 the Canadian Radio-Television and Telecommunications Commission (CRTC) ruling. School of Library and Information Studies: University of Alberta.
7. Ibid, p. 1
8. The specific deliverables of the Broadband Discovery Project include: Feasibility Study (based on the aggregate findings and results from consultations and information gathering); Business Case (presenting options for moving forward); Community Workshops and Profiles (that outlines findings); and a Service Framework Agreement (if the business case is accepted and an agreement is required).
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10. Ibid, p. 20

11. Cybera. State of Alberta Digital Infrastructure Report. p. 15. 2016. Web. Accessed November 2016. https://wiki.cybera.ca/display/DIR/State+of+Alberta+Digital+Infrastructure+Report+-+Networking+in+Alberta+2016
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13. Hon Stephanie McLean. Minister of Service. Governement of Alberta. March 27, 2017
14. Taylor Warwick Consulting Ltd. Northern Alberta Broadband Preparedness Project: Current State. Regula & Associates Consulting Ltd. August 14, 2017.
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16. Northern Alberta Broadband Preparedness Project: Current State. Pg. 6
17. The Big Lakes County Information Technology Representative received this quote from Ask Me Ltd. Located in Grande Prairie, AB.
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20. Northern Alberta Broadband Preparedness Project: Current State. Pg. 6
21. Cybera. State of Alberta Digital Infrastructure Report. p. 34
22. Ibid
23. Telus. Telus High Speed Internet with SmartHub. Web. Accessed August 2016. https://www.telus.com/en/ab/internet/new/smart-hub
24. Need help with specific evidence of oversubscription.
25. Kline, Jesse. Why Canada has 'Third World access to the Internet.' National Post. Web. Accessed November 2016. http://nationalpost.com/opinion/jesse-kline-why-canada-has-third-world-access-to-the-internet
26. Taylor Warwick Consulting Ltd. Northern Alberta Broadband Preparedness Project: Desired State (Draft). Regula & Associates Consulting Ltd. August 14, 2017. P. 1
27. Ibid
28. Van Horne Institute: Digital Futures. Analysis of Basic Services Objective. P. 4
29. Ibid
30. According to the federl governments webpage: "The actual speeds and coverage may vary depending on the technology. For example, wireless signals may be affected by distance from the tower, terrain and weather; similarly cable and digital subscriber line (DSL) technologies may be affected by distance and other factors. Actual availability may therefore vary within a specific hexagon. "Unserved" and "underserved" areas simply display the population." Canadian Radio and Telecommunications Commission. Broadband Internet Service Coverage in Canada. http://www.crtc.gc.ca/eng/internet/internetcanada.htm
31. Canadian Cable Systems Alliance Inc. Submission for Consideration in the Standing Committee on Industry, Science and Technology's Study on Broadband Connectivity in Rural Regions. September 26, 2017. P. 7. Web. Accessed September 27, 2017. https://www.ourcommons.ca/Committees/en/INDU/StudyActivity?studyActivityId=9604427
32. Ibid, P. 9
33. Understanding Community Broadband: The Alberta Broadband Toolkit. P. 22
34. Cybera. State of Alberta Digital Infrastructure Report. p. 66

Figures

1. Taylor Warwick Consulting & Big Lakes County. A Business Case for Next Generation Broadband. October 4, 2017.
2. Understanding Community Broadband: The Alberta Broadband Toolkit. P. 20
3. Big Lakes County Information Technology's network software. September 2017 Data.
4. Taylor Warwick Consulting Ltd. Northern Alberta Broadband Preparedness Project: Desired State (Draft). Regula & Associates Consulting Ltd. August 14, 2017. P. 4