The House of Commons,
Standing Committee on Industry, Science and Technology,
Broadband Connectivity in Rural Regions

To the Members of the Committee:

Thank you for the opportunity to comment on the Broadband Connectivity Study currently underway by the Standing Committee on Industry, Science and Technology.

This brief is being submitted by the Technology Committee (Chairman: Joe.gustafson@o-net.ca) of the Olds Institute for Community and Regional Development (OICRD), a community, board governed not-for-profit society which has invested in a fibre-optic network that passes every property in the Town of Olds, Alberta. OICRD is also the sole shareholder of Olds Fibre Ltd (OFL), a for-profit company operating under the brand name O-NET (www.O-NET.ca).

O-NET is Canada's first community-owned, open, fibre utility infrastructure and "symmetrical gig" network. The network is designed and managed to focus on the needs of the citizens and businesses desiring global standard communications for work and play. The interests of incumbents' shareholders are often in direct opposition to the interests of the communities the incumbent serves. O-NET believes that bandwidth should be open and cheap, not controlled and expensive. O-NET represents communications independence and self-determination for the community of Olds, and provides the needed backbone for this rural community's sustainability. It has also become a significant employer of well-paying jobs in our community.

OICRD's Mission Statement is:

The OICRD encourages, initiates, and facilitates community and economic development through the incorporation of the five dimensions of a sustainable community; cultural, economy, environment, governance and social.

In support of this Mission, the OICRD Technology Committee Vision Statement is:

Our community encourages the deployment and utilization of Information and Communication Technologies (ICT) applications as enablers to the economic and social development of our region.

What Constitutes High Speed Service?

In Olds, Alberta, the word "enough" is what constitutes high speed service.

For the average citizen, a 50 or 100mbps symmetrical connection capably provides for phone, internet and video services. Data is downloaded and uploaded at the same speed, removing the frustration of receiving data but having to wait to send data.

For businesses, the need for bandwidth is quite varied. For the small business that only uses bandwidth for telephone and Visa/MasterCard interactions, then 100mbps is "enough". For an engineering company doing 3D drawings and large AutoCAD designs a gig service may be required.

Olds is the home of Olds College, which has about 1700 students and in excess of 300 staff. With fibre-optics in place, all users have access to gig capacity. Much of the student instruction and learning is done through 'cloud' internet, and the 450 bed student residences have a gig fibre connection to every room.

The CRTC has ruled that 50 mbps is the definition of high speed broadband. We believe that 50 mbps will shortly be deemed insufficient for much of our population.

We also believe there needs to be two areas of clarity in regards to internet speed imposed on the industry:

1. All ISP need to guarantee the ability to deliver on the speeds they are selling. At the present time ISPs sell 'higher' speeds knowing full well that the vast majority of the time they cannot deliver as advertised. Penalties should be imposed for the biggest deception happening in the history of ICT.

2. There is a great deal of terminology confusion in the market place with all providers claiming "high speed" or "Ultra High Speed" services. Upgrading from 10mbps download with 1mbps upload to 25 and 5 mbps doesn't achieve the CRTC recommended speed, yet this "best effort" commitment is promoted to be 'High' or 'Ultra High' internet speed. This is like a soft drink company selling 355ml can of soda and calling it 1 litre. There is clarity in the general market place; this needs to be created in the broadband space as well.
   We recommend the following terminology be standardized when describing service offerings:
   - **Basic** Broadband Service: 1-50 download speed, any amount of upload speed.
   - **Standard** Broadband: 50-100 mbps download with a minimum of 10 mbps upload. The CRTC recommended "standard"
   - **High** Speed: 1000-100 - a gig (1000 mbps) download with 100 mbps upload.
   - **Ultra High** Speed: 1000 -1000 or above with symmetrical upload (same as download).

A fibre-optic network has an unlimited capacity for bandwidth. On a single fibre, O-NET can deliver 2400 mbps. Our infrastructure design is based on a 1/16 split for each fibre and thus even at full capacity, the minimum delivered to a citizen or business is 150mbps symmetrical. The fibre being at full capacity for more than a millisecond or two is very rare.

While traditional conveyance systems (copper and coax) can be upgraded to deliver higher bandwidth, the installation of fibre-to-the-premise provides an infrastructure that not only addresses today's consumer requirements, but also for decades into the future. As the splitting of light waves allows more data to be transmitted, the end result is an infinite capacity and thus the infrastructure never needs to be changed. The only thing limiting fibre is the electronics on each end of the fibre.

Older technology requires incumbents to throttling back in the amount of data that a customer sends or receives, and most impose data caps. With fibre, this is never an issue and thus O-NET has no data cap. We have some customers using 100s of gigabits a month and we have no concern with those utilization rates.

What fibre based, ultra-speed leads to is a license to innovate. "Enough" bandwidth need never get in the way of innovation. Citizens and businesses can, and do, expand their use of the internet daily. Our community has acquired businesses because of abundant and inexpensive broadband. Engineers working from home, video production companies and magazine publishers are just a few examples.

A community engagement site at the local library has 18 computers, each with gig capacity allowing them all to be used at once, with no degradation in bandwidth. This is a significant benefit to our immigrants as they become established in our community. The Olds Connected Community committee is teaching uses for technology, including "Cyber Senior" lessons. High school and post-secondary students can access digital content to complete online assignments using communication levels currently not present in the home.

O-NET Public is a free Wi-Fi network throughout the business district, the community parks and our hospital and Long Term Care facilities. There are no data limits and access is universal. The long term objective is to reduce the price of our fibre bandwidth so price is not a barrier to entry.

Broadband has opened opportunities for Olds. Being rural, no longer means being in the middle of nowhere as nowhere no longer exists. The world is now our market place. Rural leaders are starting to understand that to have strong economies, quality education and health care, and lifestyle options, real "high" speed broadband is essential. Recognition of this essential service will not only drive economic growth in rural communities, but will expand the marketplace to an online marketplace, creating jobs and businesses opportunities.

Financial Challenges:

For the Olds Institute (OICRD, the process started with a detailed survey of the citizens of Olds and district. What the survey revealed was that what the populace most desired was higher speed and more reliable internet service.

In 2004, the Technology Committee of OICRD[a] focused on building an "open access network", attracting the incumbent telecommunications providers to enhance their services in our community for a modest access fee. Unfortunately, both Telus and Shaw were:

1. unwilling to invest in a fibre-optic infrastructure in a small rural community like Olds[b], and
2. uninterested in developing a partnership, with our community building the "dark fibre" infrastructure and the Telecom providing their services over that infrastructure for a modest access fee. Their commitment to maximizing revenues and profits from their existing infrastructure is understandable from an investor perspective, but unacceptable for sustainable rural development.

After over two years of fruitless negotiations with these providers, we resolved to develop our own corporate entity to deliver services over our fibre network and enable our community to participate in the national Digital Economy strategy.

Deployment started using over $3 million of grant money provided by the Government of Alberta. We were unsuccessful at attracting any private industry partners, and moved forward with debt financing, provided by the Town using their access to low interest Alberta Capital Finance Authority funds. We made numerous applications to the Government of Canada under programs recommended by our MP's and other federal officials we talked to, but all requests for grants or loans were turned down because our broadband initiative "didn't meet the criteria for the program".

Along the way we had to negotiate/acquire rights-of-way and a Municipal Access Agreement, ISP licenses, CRTC licenses, telephone exchange status, TV networks, billing systems, utilize legal services, and the list goes on and on. The first customer cannot be connected until all the parts are completed and without a reference community or model, this time lag was a huge barrier to success.

As Olds was the first in Canada to build a community owned fibre-optic network with all services, we were in a situation of relying on consultants to show us the way. The consultants, although well-intentioned, didn't necessarily know the way to success. As well, the only companies with experience in deploying fibre-optic networks were the incumbents and they were certainly not motivated to help us. As a result, our projected costs escalated by 230%, and our forecast windfall of profits for the community were replaced by a focus on financial survival.

Although the CRTC has ruled that incumbents must allow leasing of their fibre to other companies, there is no transparency within the industry as to how much fibre will be leasable, at what price and where interconnects will happen. The need for these interconnects for a

small company makes them vulnerable to competition from the incumbents, akin to the fox controlling the door to the hen house (world).

Olds Fibre Ltd has been fortunate in partnering with other companies doing interconnections and together we have created the Calgary Internet Exchange. This interconnection site has allowed for bulk purchasing and has reduced the cost of bandwidth by many times. The need to purchase bandwidth in bulk is important as there is an economy of scale in the industry. Contracts are usually long-term and difficult to change as demand changes.

The start of construction to the light-up of the first customer took about 2 years. Then we were forced to replace some ill-advised equipment to make the network robust and exceptional. This product refreshment period caused additional delays and an initial opinion that we had created an inferior product. As well, it reduced our realized revenues to zero while projected operating expenses stayed on budget. A revised and expanded marketing plan was required to get things back on track, but the delays we very, very costly…in the millions.

Now with a robust quality service to market, we discovered that even though citizens had expressed high interest in O-NET in the marketing survey, their concerns about services, costs and content trumped civic pride, and sign up rates where much slower than expected. After 4 years of intensive marketing, the O-NET has about 40% of the Olds market and is finally cash-flow-positive…a young and maturing business.

Without the commitment of the Town of Olds as the financier, and the community as a whole that bought into the vision, the network would never have been built. The network is owned by the Olds Institute, which is really the community, not by the Town Corporate.

As mentioned earlier, the Olds Institute (OI) has over the past few years applied for numerous federal grants to help us build and lite up our network, and to research the innovation and engagement by businesses, education, health, and the general community as to how to enhance the uptake and knowledge benefits of broadband. All such applications have been declined and the process has been very frustrating and time consuming, particularly for a volunteer based organization like the OI. The authors of these grants don't fully understand the needs of rural communities and make grants specific to what they perceive to be the needs. Supporting an entrepreneurial initiative is something that government talks about supporting but never funds.

As a result, the Federal government, while being supportive in spirit, has never helped in the development of our network. The new fund by the CRTC may be of value but access to these funds is difficult and cumbersome and limited to very remote and very underserved areas of the country. There is no recognition that people in the rural areas close to urban centers are also very much under-served and for communities like Olds and O-NET to serve them is difficult without some funding assistance.

Challenges of Implementing higher speed internet service

1. The number one financial challenge in the implementation of a fibre network is that a new company or organization is starting with no customers, hence **no cash flow**. Providing key conditions for fibre builds, such as early stage support or demand aggregation, is time-consuming and requires a concerted marketing and promotions program. Incumbent internet providers have a tremendous advantage over startups as they have a customer base and thus have a continuous cash flow throughout the process.
2. Unlike large incumbents whose primary focus is profit and share price, small community networks like O-NET are expected to transform local economies or improve communities' quality of life. This **balancing act** of trying to pay for a network and do what is best for the community is an ongoing challenge, even when introducing these innovative technologies can be game-changing for a community.
3. **Capitalization**: Our experience has been that there are few sources of capital for community projects like O-NET. Government regulations stood in the way of a community enhancement bond, and government grant programs always were just out of our reach.
4. **Connectivity**: While there are several fibre-optic cables passing through Olds, accessibility and price have proven to be obstacles.
5. **Knowledge and experience**: O-NET had to use trial and error in making most major decisions, from design and deployment of the fibre to service platform to electronics sourcing to marketing to billing systems, and so on. It wasn't until 2016 after five years of building and start-up that O-NET could actually build its Business Plan and budget based on experiential data versus guestimates and input from consultants. All communities will face the same issues but now they can access O-NET's experience on building and managing a high speed fibre optic broadband internet in small town Canada, allowing them to build their network at a significantly lower capital cost.

With the recent statement by the CRTC about broadband being an essential utility for all Canadians, the question needs to be asked as to whether the deployment of broadband should now be a tax payer's issue. If there was no requirement for a network to repay debt, similarly to water, roads and other municipal infrastructure, the cost of services to the average household and business within a community could be reduced significantly and the savings in ICT costs would more than offset any municipal tax increase to retire the debt. With the network being developed on an "open access" model, such as O-NET, then all incumbents and startups would have equal access to the end user. This would result in better services, lower prices and ultimately increased use of ICT for the economic development that all communities desire.

Recommended Regulatory Changes to Encourage Development of High Speed Internet:

The changes required to encourage the deployment of high speed networks in Canada are varied and multifaceted.

1. The CRTC ruling on incumbents required to lease fibre and other infrastructure to other companies must be accompanied by a ruling on transparency. The process of finding out where there may be fibre or other infrastructure to lease is long and secretive and there is no transparency as to pricing and thus startups and other smaller ISPs are at the mercy of the incumbents. There needs to be reasonable interconnection points.
2. The purchase of haul back bandwidth for smaller ISPs needs to be transparent and documented so that comparative decisions can be made. There are no set prices for X amount of bandwidth for Y distances but rather whatever the incumbent wants to charge on any particular day.
3. All ICT companies and ISPs must be made to deliver on what they are selling. The general publics is not well informed on what a particular "best effort", offered speed is and thus commit to long term contracts that can't be canceled but also can't be fulfilled by the company. If you buy a soft drink, you know that 355ml costs $x and you can compare from store to store. The 355ml soft drink never changes size or becomes "best effort" to supply 355ml.
4. Front load contracts should have longer term fixed pricing. Many companies promote by giving 3 months at reduced prices or free TVs etc. and then regular prices over the remaining 2 year contract. It is assumed by any consumers that the remainder of the contract is at a fixed price but this is seldom the case and thus price increases over the 2 years soon negates any savings realized in the being.
5. The CRTC should make it mandatory to lease any fibre that is not at full capacity to any other incumbent or ISP. This would prevent the over building of other company's fibre and free up capital to deploy fibre in other areas. The cost of deploying fibre from point A to point B is the same for everyone and having excess fibre deployment just to take away another company's customer base results in millions of dollars being underutilized.
6. The CRTC should mandate that all TV studios must deal with all ISPs and network owners regardless of size. With minimum customer counts and varying fees based on numbers of customers, put the small and start up networks at a severe disadvantage. This present system puts the larger incumbents at an advantage and sometimes they will get exclusive access to programing.

We would like to suggest that a tax credit to the consumer may be the best and most efficient way to support broadband networks and encourage the deployment of fibre in rural Canada. A tax credit would have two outcomes;

a) First, the consumer would become more educated about the advantages of a "high" speed connection and as stated previously, would be incentivized to be creative and innovative about using a high speed connection. Our experience shows that once a customer uses a higher speed connection, they seldom want to return to the old slower speeds.
b) Secondly, a tax credit would apply only for rural or remote citizens and not support any particular ISP or incumbent. These funds would encourage the customer or citizen to seek out a provider that can deliver a 50mbps connection. This direct to consumer tax credit would be easier to implement, would require the tax payer to prove that such a connection has been installed (maybe registered against the title) and the speed would be scrutinized by the consumer.

A $1500 tax credit would be large enough to get the attention of most taxpayers and would result in an immediate effect on ISPs and network operators to build high speed networks. The tax credit would ultimately encourage investments by the ICT industry because they would have a larger and motivated customer pool to sell to and customer counts are the long term life blood of any ISP or network operator. With the funds going to rural residents, it would offset to a degree the lack of density enjoyed by large urban network operators.

This is a very clear situation where our Federal Government can assist and support an innovative, replicable model of a rural community facilitating and ensuring its own sustainable future, instead of the government being expected to do it.

Our MP, Earl Dresshen, has been very supportive in keeping us aware of existing programs that we could access both for enhancement of the network but also to help make our citizens intelligent users of technology. Unfortunately, we have yet to qualify for any federal funds.

This project continues to align with the Vision and Mission of both the OICRD and the Technology Committee of the OICRD to realize or potentially achieve the following benefits:

1. Building capacity within the private sector
2. Preserving sustainable rural communities
3. Encouraging community members and volunteers to take the initiative in protecting and preserving their community
4. Innovation and Technology
5. Expanding international trade opportunities
6. Reducing infrastructure pressure on overloaded urban centers
7. Advancing modern, lower cost health care alternatives
8. Enhancing education opportunities, not only for the regular student body, but for the underprivileged and financially challenged
9. Community collaboration, partnerships, and cooperation
10. Job creation

Background Document for Olds Fibre-to-the-Premises Network

Thousands of volunteer hours have been invested in assembling the technology, services, community buy-in and political support to make our network a reality as detailed below.

1. The Alberta government recognized the need to create a working model of a community based network supporting access to global, leading edge technology. They recognized the lack of information available in Canada for the development of a community network and have provided $3.5 million in grant support for our initiative.
2. The Town of Olds, through four separate councils, have grasped the vision and through the necessary bylaws, have committed to loaning the project up to $14 million with terms having been extended from 10 years to 25 years. They also guaranteed a $4 million line of credit at the local credit union.
3. A survey was conducted in the community to test the interest and predicted take rate. The indication from nearly 500 respondents showed over 70% of residents were interested, very interested or committed to signing up as soon as it was available.
4. Olds Fibre Ltd. (OFL), a wholly owned, for-profit company of the OICRD was incorporated to provide all retail services and customer contact for our new network branded as O-NET.
5. In the fall of 2011, the new CEO of OFL visited nearly 50 businesses in town to get an impression of their awareness and interest in O-NET. 96% of those businesses were aware of the project, and 100% said they were anxious to become clients as soon as we could provide them with a connection.
6. Our Central Office was completed on a piece of land donated by the Olds Regional Exhibition (formerly the Olds Ag Society). This modest (2,000 sq. ft.) state of the art technology center, houses all head-end network electronics plus office space. It is large enough to accommodate growth and regionalization of our network to other interested communities.
7. Distribution network installation started in the fall of 2011 and proceeded over 4 years. As the whole network is underground, building seasons are determined by weather. This limitation also applies to when we can install a final drop fibre to a residence or building. Aerial deployment would eliminate a lot of these weather and seasonal restrictions, but full cooperation from the power utility company that owns the poles is required, and sometime hard to get without a significant cost attached.
8. A complete service package of internet, voice and video products is available and varies from time to time due to market conditions. See www.O-NET.ca
9. In recognition of the community's educational needs, OICRD in cooperation with the Olds Municipal Library has built a Community Engagement Site in the library, which houses multiple publically accessible computers and meeting rooms equipped for video conferencing. These facilities are highly engaged by underprivileged, special needs and immigrant members of our community.
10. In anticipation of the economic opportunity for our businesses to participate in the digital economy, a special committee (Olds Connected Community Committee) was struck to cultivate a culture of use in our SME community. Over the past two years, there has been measurable accelerated adoption of information and communication technologies through training and facilitation.
11. Regulatory issues related to CRTC are current and all appropriate licenses are in place.

12. All TV signals have been received by satellite receivers but we hope terrestrial transmission of signals will happen this fall. This will allow less interference, availability of more channels and lower costs of operations.
13. The financial models generated by our consultants were extremely unrealistic and over optimistic as to when we would become profitable, but we are reaching that mile stone in 2017, five years later than forecast.
14. A critical outcome of this initiative was to assemble experiential data (not currently available in Canada) on creating and operating a community owned network. Our model will be transferable and replicable to other rural Canadian communities and expandable to rural communities in our region. Our project speaks to the need for rural centers to have the ability to offer their business communities and citizens the same access to the global marketplace that urban centers offer, thereby reducing the growth in rural-urban disparity, particularly in the small to medium business sector. This has been more than an investment in Olds, Alberta; it is benefiting rural communities across our great country. O-NET is contacted weekly for information and we have tried to help whenever possible.
15. We projected about 47 man years of employment during the building of the network and presently have 2.5 FTE working on our outside plant (OSP).
16. We presently have 15 FTE employed in the O-NET offices. These positions vary from the General Manager, Director of Technology, Financial manager, Director of Marketing and customer relations personnel and IT specialties managing various parts of the network.
17. The community has deployed free Wi-Fi throughout the parks and business districts in the community. The 10mbps network is highly used each day.
18. A free Wi-Fi network has been installed in the Olds Hospital and Care Center which previously had no internet capabilities. The network reached a record 1920 unique users in March 2017 who downloaded 1.13TB (terabits) of data. 1 TB = 1000 Gigabits = 1500 CD-ROM disks.

Notes:

a. The Olds Institute for Community & Regional Development (OICRD) is a public, board-governed, not-for-profit society incorporated under the Societies Act of the Alberta. It has a mandate with the Town of Olds to provide community based direction and initiatives for sustainable community and economic development. The four founding and Essential Members of the board are Olds College, Town of Olds, Olds and District Chamber of Commerce and the Olds Regional Exhibition (formerly the Olds Agricultural Society). There are also eight board members from the public at large plus three Associate Members (Mountain View County, Chinooks Edge School Division and Red Deer Catholic School Board). Over 140 volunteers are actively engaged in social, cultural, environmental and economic support roles.
b. Olds, Alberta has a population of nearly 9,300 people and is a major service center and regional market for over 40,000 residents in Mountain View, Clearwater, Kneehill and Red Deer Counties. It the home of Olds College, the Bell eLearning Innovation Center and the internationally recognized Community Learning Campus.