



The Qimirluk Proposal:

An Open Gateway to Deliver the Promise of Broadband

Further Intervention by the SSI Group of Companies

Schedule 2 – Broadband and Economic Development

February 1, 2016

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1. Broadband, the infrastructure across which it is delivered, and the ease of access to broadband service, play an important role in economic development.
2. For those looking at the issue - governments, universities, researchers, major technology groups and communications companies – broadband is identified as one of the most important factors to participate fully and effectively in today’s economy. In short, broadband availability and cost have major implications on all economies, and especially economies in development.
3. From a public policy perspective, various governments and regulatory agencies have responded to this fact through action plans, regulatory frameworks and investments programs to develop communications infrastructure.
4. As is clear from our proposals to modify the BSO, SSi is advocating the Commission do the same. In earlier interventions to the Commission, SSi has directly discussed the positive impact of broadband on the economy¹.
5. In this schedule, *Broadband and Economic Development*, with the intent to add helpfully to the analysis on the public record, we provide extracts and insight from a variety of influential voices describing the positive relationship between effective broadband access and economic development.
6. First, however, we provide a brief update on Canada’s northern economies to underscore why broadband development is of particular importance.

A Brief Northern Economic Review

7. Over the past decade, Canada’s northern economies have grown at a rapid pace and many northern local community economies are evolving and changing just as quickly. Although, in recent years the slow downs in the resource sector have had a dampening affect on territorial GDP growth, particularly in the western arctic. Nonetheless, the northern

¹ In previous interventions and submissions to the Commission, SSi has described the essentiality and impact that broadband has on the economy. Section B of SSi’s Intervention to the CRTC for Telecom Notice of Consultation 2012-669, “Review of Northwestel Inc.’s Regulatory Framework and Modernization Plan” reviews how broadband is essential and positively impacts the economy. More recently, in our initial intervention to this hearing, TNC 2015-134, we describe in depth the impacts that broadband has on economic development in the North at Section 2.2 of our July 14, 2015 Intervention. We also describe further, in response to the Commission’s Questions for Discussion the role of broadband and Information Communication Technologies have in the economy in our responses to Question 1 (a) through 1 (f).

territories, especially Nunavut, have had some of the highest GDP growth rates across the country.

8. Nunavut, a territory with the smallest population and the largest land area in Canada, has the fastest growing economy in Canada. Nunavut experienced a 6.2% increase in GDP in 2014 following an astounding 11.5% increase to GDP in 2013. The Northwest Territories also experience significant GDP growth compared to the provinces. In 2014 the NWT's economy grew 6.8% and had grown 3.9% in 2013. The following table details the percentage of GDP growth for Canada and each of the provinces and territories².

Table: Real Gross Domestic Product, Year on Year Percentage Increase

	2010	2011	2012	2013	2014
CANADA	3.5	3.0	2.0	2.1	2.4
NUNAVUT	21.2	4.6	1.1	11.5	6.2
NORTHWEST TERRITORIES	2.5	-8.2	2.3	3.9	6.8
YUKON	4.4	4.1	2.5	-0.7	-1.2
NEWFOUNDLAND AND LABRADOR	5.6	3.1	-4.6	7.3	-2.9
PRINCE EDWARD ISLAND	2.0	1.8	1.1	2.2	1.3
NOVA SCOTIA	2.8	0.5	-0.1	0.4	1.6
NEW BRUNSWICK	2.0	0.4	-0.6	-0.6	0.0
QUEBEC	2.1	2.0	1.3	1.1	1.4
ONTARIO	3.4	2.4	1.6	1.2	2.3
MANITOBA	2.6	2.1	3.2	2.3	1.1
SASKATCHEWAN	4.4	5.8	2.9	5.0	1.4
ALBERTA	4.8	5.8	4.2	4.1	4.4
BRITISH COLUMBIA	3.3	2.8	2.5	2.1	2.6

9. The North's economies are also structured differently than the rest of Canada. Unlike most of Canada, the public sector constitutes a disproportionately larger portion of the economy in Nunavut, the NWT and the Yukon. The other major sectors composing Canada's northern economies are: Mining and Resource Extraction, Construction, Tourism, Arts and Culture, and Fisheries.

10. Barriers to business and entrepreneurship are high in the North. From high cost inputs to a small customer or client base, running a business in the North is a challenging feat.

² Source: Provincial and Territorial Real GDP by Industry StatsUpdate, Bureau of Statistics, 2014, [http://www.stats.gov.nu.ca/Publications/Annual/Provincial%20and%20Territorial%20Real%20Gross%20Domestic%20Product%20by%20Industry%20StatsUpdate,%202014%20\(preliminary\).pdf](http://www.stats.gov.nu.ca/Publications/Annual/Provincial%20and%20Territorial%20Real%20Gross%20Domestic%20Product%20by%20Industry%20StatsUpdate,%202014%20(preliminary).pdf)

Investment into infrastructure of all sorts is an absolute must for the North and must be a priority for economic development stakeholders.

11. Through population growth, improving education rates, better health and major infrastructure investments the North will continue to lead the pack in GDP percentage growth across Canada.
12. The North is also a young and rapidly growing population. As opportunities continue to expand in the North, the population is expected to continue to grow at a rapid pace. Being a young population also means that education and health must remain high priorities; something which broadband can assist with immensely.
13. While the North's economies are showing growth, they are not supported by adequate infrastructure; communications infrastructure being an even greater factor in many northern communities considering the lack of road or rail access across much of the North. Given the agreement amongst academics, the private sector and governments, we believe that improving communications should be a high priority for any economic development occurring in Canada's northern territories.
14. Ultimately, though, economic development for the North must come from within the communities by the local residents. Improving access to broadband is one the most impactful methods of supporting local economic development.

On the Importance of Broadband for Canada's Remote Northern Economies

15. Canada's North represents a unique economy for the nation and for the world. The northern economy, especially Nunavut, is characterized by a large landmass, low population density, harsh climates, high cost inputs and limited access to adequate infrastructure. Communications, such as broadband Internet, represents one of only three ways to gain access in or out for many of these remote northern communities; the only other way in or out of a community is to fly and via the ocean, such as sealift cargo, during the summer.
16. Broadband is important to the North's growing and developing economy. As the diffusion of broadband throughout all economic activities in today's digital economy increases and as these northern community economies develop further the requirement for greater broadband will continue to rise at an increasingly rapid pace.
17. From enabling rich communication between businesses and customers to providing access to the global knowledge economy, it is broadband that will act as a basic input or tool to be used by any participant in the North's economy. As the North's economic sectors mature, such as fishing, tourism, arts and culture or resource extraction, and as these sectors

become more dependent on broadband enabled technologies to remain competitive in a global marketplace, broadband will become evermore important to Canada's remote northern economies.

18. The unique challenges facing the North and the drastically different composition of remote northern economies, when compared to the rest of Canada, means that economic development policies aimed northern communities – that includes broadband infrastructure development – cannot be a one-size fits all solution. An economic development, or broadband development, strategy or regime designed for a southern rural or urban area may have no impact or positive consequences for remote northern communities.

19. In their February 2013 intervention to the Review of Northwestel's Modernization Plan, CRTC TNC 2012-669, the Government of Nunavut describes the importance of broadband on the Nunavut economy:
 2. *Telecommunications have an important role in a modern economy's ability to expand and diversify. In order to succeed in the territorial and national economy Nunavut businesses, especially those in remote communities must have access to the technological advances found in other jurisdictions.*

 3. *The availability of modern information and communication technologies (ICT) assist businesses in improving productivity and competitiveness. The realities of operating in Nunavut – for example, remoteness and high costs – already hamper the ability of business creation and expansion. The difficulties of operating in the North can partly be alleviated with the availability of affordable, reliable and modern ICT services.*

 4. *Some benefits of improved telecom and broadband services are: a greater ease in working remotely; better access to modern business tools; a reduction in the need for travel; access to government services (e.g. business licensing and regulations) and business services (e.g. banking and marketing); and, the ability of Nunavummiut to be entrepreneurs in their own community.*

 5. *Nunavut's economy will drastically expand over the short to medium-term horizon; this expansion is a result of increased mining activity and growth of the private sector. As a result, the demand for improved ICT and broadband availability will grow drastically.*

 6. *Some of the aspects of this growing demand are:*

- *The rapid expansion of Nunavut’s economy;*
- *Population growth and demographic changes;*
- *Mining activity, as Nunavut’s mining industry will require industrial broadband and communications technologies;*
- *Nunavummiut will have greater wealth, as a result of economic expansion, which will increase their demand for better services;*
- *Climate change, as it relates to commercial shipping through the Northwest Passage, will increase the need for the monitoring of marine transportation and search and rescue requirements; and,*
- *Concerns over Arctic sovereignty and national security.*

7. *The health of our communities relies, in part, on modern communication technologies. ICT heavily impacts the sustainability and long-term survival of all Nunavut communities.*

8. *Ease of access to modern ICT infrastructure is essential to business, employment and efficient government administration. The health of each of these aspects affect the likelihood that people will live or engage in economic activities in remote communities. Minimizing deruralization – the movement of people from small communities to larger communities – and improving community sustainability hinges on the availability of modern communication technologies.*

20. In Canada, the National Broadband Task Force was established in 2001, under an initiative of the Minister of Industry, to understand, report on and provide suggestions towards the development of broadband for all Canadians.

21. Chaired by Governor-General David Johnston, who was then President of the University of Waterloo, and with a diverse membership of experts, including from the North, the Task Force emphasized the importance of broadband for remote northern communities, and to provide a lengthy but insightful quote from their 2001 report “*The New National Dream: Networking the Nation for Broadband Access*”³:

The Task Force is convinced that, over the next 10 or 20 years, the development of broadband networks, services and applications will have a profound effect on all aspects of Canadian life. Broadband will transform the way we learn, the way we work, the way we use our leisure, the way we govern ourselves, the way we communicate, the way we express ourselves and the way we care for each other.

³ *The New National Dream: Networking the Nation for Broadband Access*, National Broadband Task Force, 2001, Pages 3-4.

It is no exaggeration to say that over time, the impact of broadband communications on Canadian life will be at least as great as the impact of railways, highways, airlines, traditional telecommunications and broadcasting.

To a large extent, broadband communication networks, services and applications will be developed by the private sector in response to market needs and public requirements. However, even a force as powerful as broadband communications cannot repeal the laws of economics.

For the foreseeable future, in spite of continuing technological progress, the basic facts of Canadian geography and demography continue to mean that it will not be profitable for the private sector to provide broadband service in scarcely populated areas of the country. Paradoxically, however, the need for access to broadband communications is higher in these areas than in urban centres.

Why is this so?

The most revolutionary aspect of broadband is its potential to reduce greatly, and even to eliminate, distance and time as cost factors – in economic activity and in providing public services.

The Task Force found compelling evidence that there is a systemic gap between the quality of life enjoyed by Canadians living in or near the urban areas of the country and those living in rural, remote and northern areas. Similarly, there is a significant quality of life gap between Aboriginal peoples and non-Aboriginal Canadians. To a greater or lesser degree, this gap exists on every basic measure of human well-being – whether it is income, employment, educational attainment or health.

The Task Force is convinced that broadband has the potential to bridge this gap. With access to high-speed broadband services, it would be possible for a rural, remote or northern community:

- to strengthen its economy – e.g., by using multimedia Web sites and on-line purchasing systems to sell products and services based on the community's unique attributes and comparative advantages to regional, national and global markets;*
- to improve its health care – e.g., by using video conferencing facilities that would allow local medical staff to diagnose illness and treat patients in real-time consultation with specialists at teaching hospitals in urban Canada; and*
- to make new learning opportunities available – e.g., through on-line video forums linking Aboriginal students and other secondary school students from the different regions of Canada to discuss key issues of Canadian history and the current public agenda.*

The Task Force is convinced that using broadband to help bridge the economic and social gaps that currently separate Canadian communities is more than a policy imperative – it is a new, national dream that could bring immense benefits to all Canadians, if we have the courage to live the dream.

- *As a nation, we are committed to providing equitable opportunities to all Canadians, no matter where they live. So we should take advantage of broadband to help us achieve this most basic public goal.*
- *To compete successfully in the global environment of the 21st century, we need to recognize that the performance of our economy is interdependent with the performance of our public services – particularly our learning and health care systems.*

We will only be able to maintain our world-leading quality of life if all the fundamental elements of our national life are working together, so that all Canadians have the greatest possible opportunity to achieve our potential and contribute to our success. To do this, we must take advantage of broadband.

22. Some years after the National Broadband Task Force, in response to a major communications systems failure in 2009, resulting from a major influx of people into the Arctic for Operation Nanook, the Northern Communications and Information Systems Working Group (NCIS-WG) was created “... *to develop an understanding of communication capabilities in the North, assets that are available, identification of communications deficiencies and redundancies, and development of a timeline to address concerns/issues.*”

23. The members of the NCIS-WG included those from federal and territorial government departments. In 2011, the NCIS-WG released its final report entitled *Arctic Communications Infrastructure Assessment Report (ACIA)*. In this report the NCIS-WG had this to say about the importance of broadband for the North⁴:

The Internet has become a necessity of life for much of the world’s populations. Northern Canadians are no exception.

Internet services make northern, remote and isolated communities more sustainable and will aid in their long-term survival. IT and good electronic communications are essential for business, employment and efficient administration; all key components that increase the likelihood that people will live in remote communities.

⁴ *Arctic Communications Infrastructure Assessment Report*, Northern Communications Information Systems Working Group, 2011, Page 156.

Over the next 10 to 20 years, the territorial economies will grow significantly, contributing a larger portion of the nation's overall wealth.

Some of the growth and the socio-economic changes that it brings will affect and be affected by Internet services:

- *population changes (most pronounced in Nunavut) will create greater demand;*
- *the development of mineral deposits throughout the North will mean more industrial demands for Internet services, generate greater wealth for Northerners who will spend it in part on or through the Internet;*
- *climate change and its impacts on (among other things) marine transportation through the Northwest Passage;*
- *sovereignty issues.*

Despite the growing economy or perhaps because of it, there are real threats to the sustainability and survival of northern communities. Communication infrastructure can play an important role in mitigating these threats, such as:

- *slowing Arctic deruralization (the outflow of people from smaller to larger centres);*
- *assisting business development;*
- *benefiting government service delivery.*

24. The Organization for Economic Co-operation and Development, a constant proponent of broadband development, has produced a significant number of reports on the subject. One influential 2007 report entitled *Broadband and the Economy* was prepared by OECD staff for the 2008 OECD Ministerial Council Meeting topic *The Future of the Internet Economy*.

25. The OECD's *Broadband and the Economy* Report described how integral broadband is in the digital economy⁵:

Broadband networks are an increasingly integral part of the economy. As the technology evolves and bandwidth increases, the scope for broadband to act as an enabler of structural change in the economy expands as it affects an increasing number of sectors and activities. Direct effects result from investments in the technology and from rolling out the infrastructure. Indirect effects come from broadband's impact on factors driving growth, such as innovation, firm efficiency, competition and globalisation. Broadband facilitates the development

⁵ *Broadband and the Economy*, Organization for Economic Co-Operation and Development, 2008, Pages 5 and 10.

of new inventions, new and improved goods and services, new processes, new business models, and it increases competitiveness and flexibility in the economy. More generally, broadband enables improved performance of information and communication technologies (ICTs) a general purpose technology (GPT) that is one of only a few technological improvements that fundamentally change how and where economic activity is organised.

[...]

Broadband has become an integral part of almost every aspect of the knowledge economy. For example, traditional telecommunications are increasingly taking place over broadband communications networks, in particular IP networks, rather than circuit switched networks, and people also increasingly use IP telecommunications (e.g. Skype). Public infrastructure increasingly depends on broadband communications networks, from traffic lights control, through control of sewage systems, as well as many forms of transportation, air traffic control, maritime and rail transport and logistics management systems. The government itself increasingly maintains relations online with citizens and firms through the provision of e-government services (e.g. applications for permits, tax authorities, providing information etc.). Military and defence systems are also affected by broadband and the Internet. Global Positioning Systems (GPS) and other navigation systems all rely on this type of information transmission and enable new applications such as the distance monitoring of patients and prisoners. Natural and other disaster prevention and warning systems also heavily rely on the Internet and broadband communication networks.

26. A more recent voice, from 2015, Dr. M. Ishaq Nadiri and Dr. Banani Nandi describe the importance of broadband in their review *Modern Communication Technology and its Economic Impact: A Survey of Research Findings*.⁶

27. Nadiri and Nandi write of the importance of broadband in the economy in *Modern Communication Technology and its Economic Impact: A Survey of Research Findings*⁷:

In the modern era, Information and Communications technology (ICT) is an important source of economic growth and productivity improvement. Empirical evidence suggests a positive impact of ICT investment and its use on productivity at the firm, industry and national levels. In the last two decades, explosive

⁶ Nadiri, a professor of economics with New York University, has studied technology's impact on the economy for much of his career and has published papers on telecommunications and the economy since the 1970s. Nandi, a technical researcher with AT&T Labs, has published a large number of reports with Nadiri.

⁷ *Modern Communication Technology and its Economic Impact: A Survey of Research Findings*, Digiworld Economic Journal, no. 100, 4th Q. 2015, Pages 125-126.

innovation in ICT and rapid expansion of modern communications networks with fixed and mobile broadband (BB) access features are changing the way we access, store and transmit information bringing significant efficiency gains. Improvements in means of communications facilitate the accessibility of existing knowledge and information which, in turn, induces further technological change in the economy. Rapid deployment and adoption of mobile communications also permit access and transmission of information and knowledge seamlessly from anywhere in the world. The communications connectivity through the internet and mobile phones is increasingly bringing market information, financial, health, and educational services to remote areas and thus, extending economic opportunities to both urban and rural populations, even with low levels of income and literacy. The ICT infrastructure also generates spillover and network externality effects among firms and various other economic units within and across countries, leading to enhanced economic growth and development. Finally, due to various uses of ICT capital and ICT services in the production process, the input requirements of many industries are significantly changing through substitution and complementary effects. These changes have an impact on factor demands and structure of production at the micro and macro economy level and are likely to affect the aggregate demand for labor, composition of labor skills and the type of physical capitals.

Broadband's Impact on Economic Development

28. The influence that broadband has on an economy is already well-known qualitatively and quantitatively; researchers, academics and policy makers all agree that broadband positively impacts economic development. Broadband penetration improves GDP growth, increases productivity, enhances quality of life and improves access to the knowledge economy, just to name a few.
29. The North's economy needs broadband to compete and grow within today's digital world, and for economic growth to continue in the North, continued investment in communications infrastructure is needed.
30. The ACIA report puts into perspective the Northerner's requirement of broadband to develop the economy⁸:

Several studies show that investments in IT and broadband have been favourable for social development and that countries that have invested heavily also have

⁸ *Arctic Communications Infrastructure Assessment Report*, Northern Communications Information Systems Working Group, 2011, Pages 158-159.

experienced higher productivity. The competitiveness and productivity of businesses can consequently increase through more efficient production of goods and services, logistics and new business processes. Collaboration is made easier. Access to broadband makes it easier to work remotely. It enhances the possibility of launching and running a business from anywhere. It can reduce and sometime eliminate the need for travel. It means that people are able to work where they live instead of having to live where they work.

It is a major challenge for businesses to keep up with the changes resulting from technological advances, but by doing so a business can lower its costs and improve its competitiveness. In rural areas, poor access can leave businesses without any possibility of achieving these advances and in actuality, businesses won't even know what is possible or the extent to which they are disadvantaged in terms of their technological efficiencies. Businesses in Canada's territories will always have to contend with the physical realities of their operations, but higher-quality access to services through the Internet can help compensate for that.

Broadband can have a profound impact on how a community can benefit from economic opportunities:

- Economic growth can mean business opportunities through joint venture or otherwise. Communications is a key element to any business, especially partnerships. Communities with poor communication links will be at a disadvantage;*
- For many communities, postal service, facsimile and memory sticks on airplanes are still the preferred communication modes since secure Internet service is often inadequate and large file transfer impossible. This can slow the speed of business, can be frustrating, and can cause disruption to communications on important issues;*
- With the rest of the world working at broadband speeds, communities that are cut-off will not be desirable places for business;*
- For the smallest and most isolated communities, their Development Corporations or Joint Ventures would be well advised to have their principal office of business in a location where modern communication infrastructure exists. This robs the community of an opportunity to improve its wealth and sustainability.*

31. In a more general sense, the OECD report, *Broadband and the Economy*, describes how broadband supports economic activities and growth^{9,10}:

⁹ *Broadband and the Economy*, Organization for Economic Co-Operation and Development, 2008, Pages 6, 11 and 22.

Broadband networks increasingly link other ICTs in ways that should ultimately have a significant and positive effect on economic activity, with potential benefits for productivity, growth and the quality of life.

[...]

Many aspects of business are now taking place over broadband communications networks: for example, supply chain management, fleet management, e-procurement, e-invoicing, online recruitment, customer service, call centres, online payment systems, e-commerce, co-ordination of fragmented production processes both within and between firms, and the connection of teleworkers to their employers' networks. Further gains can be expected as possibilities for the use of virtual private networks and video conferencing, for example, expand with increased bandwidth. Broadband is especially important in all sectors that rely on the provision of information, especially in financial markets, insurance and accounting firms and systems. Other examples include consultancies, weather forecasts and reports, research (from school homework to professional and academic research and R&D activities), online databases, banking (offline and online) and ATM services, marketing, online advertising, advertising and graphics design industry, and news distribution (offline and online). Broadband and very high-speed networks are also playing a wider and important role in enabling innovation, another factor contributing to the conditions for sustainable economic growth.

Consumers also increasingly make use of the Internet and broadband communications networks, for example for e-commerce, online reservations (holidays, airlines, trains, concerts, cinema, etc.), online airline check-in, online payment systems (bills, banking, retail), blogs, peer-to-peer networks, online auctions, and online entertainment services (e.g. games). In addition to efficiency gains, large cost savings can also be realised by governments and business.

[...]

Baldwin and Sabourin (2002), in a study for Canadian manufacturing firms, also differentiate between three groups of advanced ICTs: software, network communications, and hardware technologies. They find that establishments that had adopted network communication technologies experienced significantly higher productivity growth than those that had not, and the largest gains were

¹⁰ The report on Canadian manufacturing firms discussed in *Broadband and the Economy* is *Impact Of The Adoption of Advanced ICTs on Firm Performance in the Canadian Manufacturing Sector*, John R. Baldwin and David Sabourin, Organisation for Economic Co-operation and Development, 2002.

found for establishments that had adopted combinations of all three types of ICTs.

32. Nadiri and Nandi go deeper into the specifics on the economic development impact of broadband on small businesses and GDP¹¹:

[...] at the firm level, the effective use of ICT may help the firm to gain market share through higher productivity in comparison to their competitors and may help the firm to innovate. In addition, ICT may help in reducing inefficiency in the use of capital and labor. Firm level studies also reveal clearly that the use of ICT accompanied by other complementary factors help in increasing the economic performance. There is also some lag time in ICT adoption.

[...]

With increasing adoption of [broadband] technology in various countries, several researchers around the world are continuously exploring various methodologies to assess the role of [broadband] technology toward economic growth. In the early stage of [broadband] penetration, studies done by CRANDALL & JACKSON (2001), CRANDALL, LEHR & LITAN (2007) are important. In later stages, important studies were conducted by CRANDALL et al. (2007) using U.S. data, KOUTROUMPIS (2009), WAVERMAN et al. (2009), KATZ et al. (2009), QIANG et al. (2009) of World Bank and SCOTT (2012) using data from countries with different incomes and by CZERNICH et al. (2011) using OECD data. Most of these studies found a positive impact of [broadband] penetration on GDP growth. Estimated incremental growth rate in these studies ranges from 0.9% to 1.5% in response to a 10% increase in [broadband] penetration rate (number of [broadband] subscribers per 100 inhabitants) and varies across countries with different income levels. Regarding the productivity gain, the WAVERMAN et al., (2009) study found that 1% increase in [broadband] penetration rate will contribute 0.13% gain in productivity.

[...]

The scope of increasing the productivity in health services, banking and related financial service industries appears to be significantly higher than other industries.

[...]

¹¹ *Modern Communication Technology and its Economic Impact: A Survey of Research Findings*, Digiworld Economic Journal, no. 100, 4th Q. 2015, Pages 130, 135-136 and 137.

At the aggregate economy level, they found that, the combined estimate of cost savings for a 1% increase in use of communications infrastructure capital together with a 1% increase in [broadband] penetration rate is about 0.0216%. They also found that estimated net social rate of return (27%) from communication infrastructure investment is quite high and indicates the high potential spillover effect from communications infrastructure capital.

33. Colin Scott, a PhD candidate with UC Berkeley and an expert on networking technologies in the developing world, wrote in his paper *Does Broadband Internet access actually spur economic growth?*, his analysis of broadband’s penetration directly on GDP growth¹²:

[...] a 10% increase in broadband penetration is correlated with a 1.35% increase in GDP for developing countries, and a 1.19% increase for developed countries. This suggests that in general, broadband deployment is a valuable investment for spurring economic growth.

34. *Information and Communications for Development (IC4D)*, a regular publication by the World Bank focusing on the role of Information and Communication Technologies in Economic Development, focuses in depth on broadband’s impact on the economy in Chapter 3 of their IC4D 2009 report. A portion discussing community competitiveness is highly pertinent to Canada’s North¹³:

Deploying broadband networks at the community and municipal levels has become an important factor in allowing local businesses to grow and remain competitive. An often-cited 2005 study by the Massachusetts Institute of Technology of a broad range of U.S. communities where broadband had been deployed since December 1999 found that it benefits economic activity in ways consistent with the qualitative stories told by broadband advocates. Between 1998 and 2002, U.S. communities that were among the early adopters of mass-market broadband experienced faster growth in employment, number of businesses, and businesses in IT-intensive sectors, as well as higher market rates for rental housing, than communities where broadband was adopted later (Gillett and other 2006; table 3.1).

Other studies of community-level broadband experiences include the following:

- *A case study of a municipal fiber network built in 2000–01 in South Dundas Township, Ontario (Strategic Networks Group 2003)*

¹² *Does Broadband Internet access actually spur economic growth?*, Colin Scott, 2012, Page 2.

¹³ *IC4D 2009: Extending Reach and Increasing Impact*, Chapter 3, The World Bank, 2009, Pages 38-39.

- *A study comparing Cedar Falls, Iowa (which launched a municipal broadband network in 1997) with its otherwise similar neighboring community of Waterloo (Kelly 2004)*
- *A study comparing per capita retail sales growth in Lake County, Florida, with 10 other Florida counties selected as controls based on their similar retail sales level prior to Lake County’s broadband rollout (Ford and Koutsky 2005).*

All these studies found that broadband connectivity had positive impacts on job creation, company and community retention, retail sales, and tax revenues. A more recent survey conducted for Industry Canada of subscribers to two remote, rural broadband networks in British Columbia found that about 80 percent of business respondents believed that they would be at a major disadvantage if they did not have broadband access (Zilber, Schneier, and Djwa 2005).

Even in rural areas of developing countries, broadband diffusion is making existing markets function better by reducing information asymmetry and creating a range of economic opportunities for communities—contributing to income diversification and rural nonagricultural employment as well as increasing incomes from agricultural jobs. In recent years, communities in developing countries have launched broadband-enabled services and applications to give local populations access to new markets and services and facilitate information exchange and value creation between buyers and sellers of agricultural products. Before that, many of these opportunities had been available only in the largest or wealthiest communities.

35. The Federal Communications Commission, in their *National Broadband Plan*, summarizes well the impact that broadband has on economic development¹⁴:

Broadband is becoming a prerequisite to economic opportunity for individuals, small businesses and communities. Those without broadband and the skills to use broadband-enabled technologies are becoming more isolated from the modern American economy.

[...]

Broadband and the Internet make it possible for small businesses to reach new markets and improve their business processes. They have also become a critical pathway for individuals to gain skills and access careers. And it is a core infrastructure component for local communities seeking to attract new industries

¹⁴ *National Broadband Plan*, Federal Communications Commission, 2010, Pages 265, 266 and 273

and skilled work forces. As a result, small businesses, workers, and communities must have the broadband infrastructure, training and tools to participate and compete in a changing economy. Broadband can help every community.

[...]

The conduct of key business activities such as communication, collaboration, process enhancements and transactions is made easier by use of broadband applications such as online conferencing, social networking, cloud-based business software and e-commerce. Perhaps chief among the benefits of broadband for business is that it allows small businesses to achieve operational scale more quickly. Broadband and associated ICTs can help lower company start-up costs through faster business registration and improved access to customers and suppliers. Broadband also gives SMEs access to new markets and opportunities by lowering the barriers of physical scale and allowing them to compete for customers who previously turned exclusively to larger suppliers. E-commerce solutions eliminate geographic barriers to getting a business's message and product out to a broad audience.

[...]

Local economic developers should view broadband as a part of local infrastructure development and should incorporate it into local economic development strategies. The federal government can also leverage broadband to facilitate better integration of its diverse investments in localities.

Broadband Infrastructure as a “General Purpose Technology” is Vital for the North

36. Like electrical, water, sewer, or road infrastructure, broadband is a basic foundation upon which a modern economy and society grows. Broadband, or the Internet as a whole, is considered by most to be a “General Purpose Technology” (GPT) and that broadband happens to be a GPT with considerable impact on the economy.
37. The OECD’s report, *Broadband and the Economy*, describes well what a GPT is in the world of economics¹⁵:

GPTs are technologies that enable changes, which is also the case for ICTs, with broadband acting as the required infrastructure enabler (like the electricity transmission and distribution network in the case of electricity), and the Internet as the platform supporting an endless variety of applications. Thus, their effects are likely to build up over time. They can be expected to raise productivity, and

¹⁵ *Broadband and the Economy*, Organization for Economic Co-Operation and Development, 2008, Page 8

give rise to network economies with network effects expanding over time. There will be new process, product and organisational innovations beyond what can even be imagined today. In fact, many new products, both goods and services, have already been created as a result of ICTs and have been fully integrated into everyday life, including working life.

38. And of its importance as a GPT, the OECD had this to say of broadband¹⁶:

It is sometimes estimated that the evolution of the impact of ICTs may be today where that of electricity was in the United States in the 1920s (Carlaw et al., 2007), but with ICTs, technological improvements are still taking place and broadband is enabling ever more applications.

39. By comparing broadband to other GPTs, the FCC, in their *National Broadband Plan*, describes how important broadband infrastructure is in today's digital economy¹⁷:

Today, high-speed Internet is transforming the landscape of America more rapidly and more pervasively than earlier infrastructure networks. Like railroads and highways, broadband accelerates the velocity of commerce, reducing the costs of distance. Like electricity, it creates a platform for America's creativity to lead in developing better ways to solve old problems. Like telephony and broadcasting, it expands our ability to communicate, inform and entertain.

Broadband is the great infrastructure challenge of the early 21st century.

40. For the North of Canada, broadband is indeed the great infrastructure challenge of the early 21st century. Broadband as a GPT fits well within the northern context, especially so for isolated and remote communities. As detailed in SSI's earlier submissions to this proceeding, we have seen a whole host of new economic activities become available since the introduction of broadband into these communities.

41. For example, banking and financial services are now available for the first time, ecommerce has greatly improved access in to all of the products and services around the world and classrooms now connect with each other to share culture, ideas and knowledge. These are but a few of the benefits that broadband has broad northern communities.

42. Through broadband small northern communities are able to have access to services that would otherwise require significant infrastructure of other types such as roads. Further

¹⁶ *Broadband and the Economy*, Organization for Economic Co-Operation and Development, 2008, Page 9.

¹⁷ *National Broadband Plan*, Federal Communications Commission, 2010, Page 3.

development of broadband is required in the North in order to realize broadband's full potential as a GPT for Canada's Arctic territories, its communities and its inhabitants.

Consensus on Broadband as a Basic Requirement to Develop a Modern Economy

43. A common theme in literature discussing the importance of broadband revolves around a similar concept: Broadband, and the access to it, is a basic economic input with major importance and a substantial impact on economies and their growth. Increasing broadband, and making it easier to access, delivers benefits to economies.
44. SSI's previous interventions and submissions to the Commission have adhered to the concept that improving broadband has significant, visible and measurable positive impacts on northern economies.
45. At present, remote northern communities do not have access to adequate broadband and, thus, these communities are not able to reach their full economic potential.
46. The North's economy and its continued growth is important to the Canadian economy as a whole. Canada's northern territories will continue to hold an increasingly more important role in Canada's economy, sovereignty and identity. Broadband development and infrastructure investment policies and regimes should reflect the importance of the territorial economies within Canada in order to realize the North's full potential.