

**THE INTERNET AS ESSENTIAL INFRASTRUCTURE:
A CANADIAN PERSPECTIVE**

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Nancy Carter

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The Internet as Essential Infrastructure: A Canadian Perspective

1 INTRODUCTION

Because the Internet¹ is changing how humans interact and how they interact with the world around them, and because the current and future economy is dependent on the Internet, it is imperative for the Government of Canada to have a digital economy strategy which ensures widespread adoption of the Internet, ubiquitous and affordable access to the Internet, and the necessary digital literacy skills which enable all Canadians to utilize the Internet.

The Internet is constantly evolving. Our Internet vocabulary has changed in the last decade from one which talked about kilobits, to one which traded in gigabits, and now we hear the term terabits bandied about. Although internetworking was originally intended by its inventors to be a method of resource-sharing over a network,² the first networks quickly became a tool for electronic mail and simple transfer of files. The Internet is no longer just about email, and has become more things to more people: Facebook, Google, Instagram, YouTube, Skype, Twitter, and on and on. Many of these terms have permeated our every day speech, becoming commonly used terms, ordinary verbs, in a relatively short period of time. This terminology transformation is indicative of the exponential growth of the use and capacity of the Internet infrastructure,³ as well as of the magnitude of content that is constantly being created, analyzed, utilized and stored.

¹ The Internet is an electronic communications network that connects computer networks and organizational computer facilities around the world.

² Katie Hafner & Matthew Lyon, *Where Wizards Stay up Late (The Origins of the Internet)*, (New York, Touchstone, 1996), at 122

³ Infrastructure can be described, in the context of the Internet, as the physical hardware used to interconnect computers and users, and can be regarded as the pipes or the plumbing that supports the flow and processing of information.

The Internet is changing in speed, size, scale, and scope. The Internet, including the content and services that it provides, has become a critical element of the digital economy, and has created dependencies and efficiencies in the daily lives of Canadians. The value of the Internet is realized when it delivers productivity gains, greater interaction and collaboration opportunities for research and education, economic advantages, and capacity for increased innovation and creativity for consumers, businesses, and governments.

The rapid acceptance and adoption of the Internet in Canada was world-leading. Canada ranked as one of the top G7 countries in Internet access and penetration until 2007.⁴ This leadership position has changed, and the international rankings that Canada previously enjoyed have been slipping. Canada has been losing ground to countries that are investing in Internet infrastructure, and that have committed to national broadband plans or strategies.⁵ Access to advanced Internet infrastructure is vital to social, economic, and knowledge development in Canada.⁶ The ability to interconnect with a global community will be essential, at least for the foreseeable future. A digital economy will be reliant on the infrastructure to enable the activities that we expect to be pervasive to a digital world.⁷

⁴ Until 2007, Canada was leading the G7 countries in fixed broadband penetration as measured by the OECD. Organization for Economic Co-operation Development (OECD), “OECD Broadband Portal” (2011), <<http://www.oecd.org/sti/broadbandandtelecom/oecdbroadbandportal.htm#Penetration>>.

⁵ When measured against other OECD countries, Canada ranked 13th in 2011 in fixed broadband penetration, down from 9th in 2007, and 2nd in 2003. Organization for Economic Co-operation Development (OECD), “OECD Broadband Portal” (2011), <<http://www.oecd.org/sti/broadbandandtelecom/oecdbroadbandportal.htm#Penetration>>.

⁶ Catherine Middleton & Christine Sorenson, *How Connected Are Canadians? Inequities in Canadian Households' Internet Access*, Canadian Journal of Communication, North America, 30, Jan. 2006. Available at: <<http://www.cjc-online.ca/index.php/journal/article/view/1656/1794>>.

⁷ Industry Canada, *Improving Canada's Digital Advantage, Strategies for Sustainable Prosperity*, (Consultation Paper on a Digital Economy Strategy for Canada), (Ottawa, 2010), at 16.

This paper presents a critical assessment of whether the Internet should be considered essential⁸ infrastructure in Canada. If it should, then what responsibility does government have, and what role should it play, in ensuring that all Canadians can access the content-rich Internet platform?

1.1 Organization of this paper

This paper looks at the Internet from a Canadian perspective. It does this by exploring the impact of the Internet, including social and economic impacts, and by questioning the essential nature of the infrastructure in sustaining those impacts.

The paper starts off in section 2 looking at the impact of the internet.

Section 3 reviews whether or not access to the Internet is a fundamental right, and looks briefly at the development and adoption of the Internet in Canada.

A number of current and past government initiatives are reviewed in section 4.

An assessment of Government responsibilities and obligations is critiqued, and the implications for the private sector are reviewed in section 5.

Section 6 briefly assesses how other jurisdictions are responding to the impact of the Internet and securing access for their citizens. The section focuses on comparisons with South Korea, the world leader in Internet access, connection speed, and price.⁹ Australia is reviewed primarily because it faces analogous geographic challenges, and the Netherlands is considered because it has employed progressive strategies in order to achieve their national objectives.

⁸ Essential in the context of this paper means indispensably necessary.

⁹ Organization for Economic Co-operation Development (OECD), "OECD Broadband Portal" (2011), <<http://www.oecd.org/internet/broadbandandtelecom/oecdbroadbandportal.htm>>.

Section 7 reviews the question of essentiality of the Internet infrastructure.

Finally, section 8 discusses the need for a digital economy strategy in Canada, and presents recommended elements of a digital economy strategy that would ensure broadband Internet access for all Canadians.

2 IMPACT OF THE INTERNET

The Internet has transformed the world economy. In 2012, the Boston Consulting Group estimated the size of the Internet economy in the G20 countries at around US\$ 2.3 trillion or 4.1% of GDP in 2010; by 2016, the size of the Internet economy could nearly double to US\$ 4.2 trillion.¹⁰ If it were a national economy, the Internet economy would rank in the world's top five, behind the U.S., China, Japan, and India. The Internet is currently contributing up to 8 percent of GDP in some economies, powering growth, and creating jobs.¹¹

Information and communications technology¹² (ICT) industries comprise the backbone of any digital economy, including Canada's, and as such they constitute one of the key drivers of productivity growth in the knowledge-based global economy.¹³ The ICT sector also plays a key role in contributing to Canada's GDP.¹⁴ In comparison to other countries however, ICT firms in Canada have been slower to adopt and implement digital technologies, certainly there has been less strategic investment than necessary to drive and sustain economic growth. When ranked

¹⁰ Boston Consulting Group, press release, (27 January 2012), online: <www.marketwire.com/press-release/g-20s-internet-economy-is-set-reach-42-trillion-2016-up-from-23-trillion-2010-as-nearly-1611718.htm>.

¹¹ David Dean et al., *The Connected World: The Internet Economy in the G20*, Boston Consulting Group (BCG) Report, March 2012.

¹² Information and communications technology (ICT) will be referenced repeatedly in this paper, and refers to the integration of telecommunications, computers, middleware and the data systems that support, store and transmit information or data between systems.

¹³ David A. Wolfe & Allison Bramwell, *Growing the ICT Industry in Canada: A Knowledge Synthesis Paper*, Munk School of Global Affairs, University of Toronto.

¹⁴ Supra note 13 at 1.

against 21 other OECD countries in total economic ICT investments, Canada came in 11th in 2007, although Canada had ranked 10th in 2005, and 9th in 2004.¹⁵ To remain competitive in the global economy, this unsettling trend needs to be reversed. GDP growth is fueled by investments in ICT, according to recent OECD data.¹⁶ Between 2000 and 2009 ICT investments contributed to 0.4% of GDP growth, a number which is significant when compared to the 1.7% average growth in Canada's GDP. ICT also impacts labour productivity; as measured between 1995 to 2008, on average ICT investments contributed .09% to the labour productivity growth in total industries of 1.06%.¹⁷ Increasing and promoting adoption of digital technologies will enable Canada to take a leadership position in a global digital economy.¹⁸

The Internet forms the backbone of many different social networks, transforming how we interact and communicate. Social networks, in the digital context, refers to the use of the Internet as a way of enabling individuals to connect, communicate, and share information in different ways. Social networks such as Facebook, LinkedIn, and Twitter are continuously being adopted by Canadians. For example, over 18.5 million Canadians currently use Facebook¹⁹ and that number has grown by over 300,000 in the last 6 months.²⁰ Two thirds of all Canadian Internet users are Facebook users.²¹ Social relationships are initiated, sustained, and maintained using the Internet; a 2009-2010 American study concluded that 17% of couples who married in the 3 years

¹⁵ Supra note 7, at 11.

¹⁶ Organization for Economic Co-operation Development (OECD), "OECD Key ICT Indicators", <<http://www.oecd.org/internet/broadbandandtelecom/oecdkeyictindicators.htm>>.

¹⁷ Ibid.

¹⁸ Supra note 7, at 19.

¹⁹ Socialbakers, "Canada Facebook Statistics", <<http://www.socialbakers.com/facebook-statistics/canada>>.

²⁰ Ibid.

²¹ Ibid.

leading up to the study, had initially met online.²² Changes in the ways that we interact socially have been incited by visionaries like Mark Zuckerberg, founder of Facebook, the impact of which is stressed in his letter to potential shareholders in May 2012:

We hope to rewire the way people spread and consume information... We think a more open and connected world will help create a stronger economy with more authentic businesses that build better products and services.²³

3 INTERNET ACCESS IN CANADA

Canadian telecommunications companies have laid vast amounts of high quality networks across this country, no small feat considering the geographical immensity of the country. However, not all Canadians yet have the ability to access or use this content delivery platform that has become essential to our daily lives.²⁴ Canadians use the Internet to access government services, to access educational tools and materials, to procure goods and services, to bring products and services to market, and to enrich their lives through access to entertainment, news, and various forms of social media.²⁵ The Internet enables a knowledge economy, a digital economy, and a global economy. Yet Canadians do not have equitable access to the Internet. Canadians in urban centres have better access to Internet and services,²⁶ with faster speeds, and lower costs, than those in rural areas. There are communities and Canadians without Internet access, and this limits their

²² Match.com, *Match.com and Chadwick Martin Bailey 2009 - 2010 Studies: Recent Trends: Online Dating*, Chadwick, Martin Bailey, <http://cp.match.com/cppp/media/CMB_Study.pdf>.

²³ Mark Zuckerberg, Founder / CEO, Facebook Letter to Potential Shareholders, (May 2012).

²⁴ The 2010 Canadian Internet Use Survey reports that 79% of Canadian households have access to the Internet. The percentage is slightly higher (81%) in metropolitan areas, and much lower (71%) in rural areas. Statistics Canada, The Daily, "2010 Canadian Internet Use Survey", (25 May 2011), <<http://www.statcan.gc.ca/daily-quotidien/110525/dq110525b-eng.htm>>.

²⁵The 2010 Canadian Internet Use Survey results show that 51% of Internet users ordered goods online in 2010 spending \$15.3 billion. 55% of shoppers use the Internet for travel arrangements, while 40% bought online newspapers, magazines, and books. Another 48% use the Internet to purchase tickets for entertainment events. The average Internet user was online 44 hours every month. 40% of that time, or 19 hours) was used to watch videos. Statistics Canada, The Daily, "2010 Canadian Internet Use Survey", (12 October 2011), <<http://www.statcan.gc.ca/daily-quotidien/111012/dq111012a-eng.htm>>.

²⁶ Supra note 24.

ability to participate in a digital world. Driving policy change to ensure that all Canadians can participate equitably in a digital environment is the responsibility of the federal government.²⁷

The goals and vision to support an Internet economy in Canada have changed over the last ten to fifteen years. What Canada once considered an important goal, as outlined in the Speech from the Throne in 1997, was to “make the information and knowledge infrastructure accessible to all Canadians..., thereby making Canada the most connected nation in the world.”²⁸ While Canada has made strides towards attainment of that objective as stated by the Right Honourable Roméo LeBlanc, it has, to date, not been achieved.²⁹ The commitment of the federal government has waned, and clear leadership, collaboration, and vision in achieving the objective has been missing. Perhaps the priorities of the federal government have changed. In the most recent Speech from the Throne, delivered in June of 2011, the Right Honourable David Johnston told Canadians that the federal government “will look for ways to support innovation” and “will also release and implement a Digital Economy Strategy that enhances digital infrastructure”.³⁰ Nearly eighteen months later Canadians are still awaiting the release of a digital economy strategy. Will this strategy be enough to stimulate the development of digital resources and technologies, ensure that Canada retains or regains its leadership position with respect to Internet penetration and adoption, and lead to the creation of new jobs and innovative opportunities for Canadians?

3.1 The “Right” to Internet Access

²⁷ See section 5, below, for more on this topic.

²⁸ Governor General, “Speech from the Throne”, 36th Parliament, 1st session (1997). <<http://www.pco-bcp.gc.ca/index.asp?lang=eng&page=information&sub=publications&doc=aarchives/sft-ddt/1997-eng.htm>>.

²⁹ See also supra note 24 and accompanying text.

³⁰ Governor General, “Speech from the Throne”, 41st Parliament, 1st session (2011). <<http://www.speech.gc.ca/eng/media.asp?id=1390>>.

In July of this year, the United Nations Human Rights Council resolved that access to the Internet and the right to express oneself on the Internet were basic human rights.³¹ In 2011, the Broadband Commission for Digital Development,³² a joint initiative of UNESCO and the International Telecommunications Union (ITU), challenged governments to increase access to broadband, challenged industry to support the achievement of targets set for 2015, and affirmed that all consumers should have access to affordable broadband Internet services.³³ The underlying premise of the initiative is that everyone has a right to knowledge, and that the right to communication is now supported by Internet infrastructure. The Broadband Challenge has five components, addressed to world leaders, governments, the private sector, and society, all designed to ensure equitable inclusion in a global knowledge economy.³⁴

Other jurisdictions have made policy pronouncements which are guiding their countries towards ubiquitous Internet access. An objective of the European Union's Digital Agenda is to ensure that all European Union citizens have access to basic broadband coverage by 2013. Minimum

³¹ Frank La Rue, *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression*, United Nations Human Rights Council, (16 May 2011).

³² The Broadband Commission for Digital Development was established by the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) in response to UN Secretary-General Ban Ki-Moon's call to step up efforts to meet the Millennium Development Goals (MDGs). Launched in May 2010, the Commission comprises government leaders from around the world and the top-level representatives and leaders from relevant industries and international agencies and organizations concerned with development.

³³ The Broadband Commission for Digital Development, *The Broadband Challenge*, (Geneva, 25 October 2011).

³⁴ Ibid. The Broadband Challenge: 1. We call on world leaders to ensure that at least half the developing world's population and 40% of households in developing countries are using broadband Internet by 2015. Consumers in all countries should have access to affordable broadband Internet services, including in developing countries. 2. We call on industry to develop innovative business models needed to realize this vision. 3. We call on governments to make broadband policy universal and to develop the enabling policy and regulatory frameworks to ensure that industry has a stable regulatory space in which to operate, flourish and harness broadband for sustainable human development. 4. We call on governments to develop policies and targets for online health and education at the national level to stimulate demand for broadband services. 5. We call on governments and civil society within a fully inclusive and consultative process to stimulate local content production as well as the development of local language services and applications for an inclusive digital world.

speed targets of 30 Mbps have been set for 2020³⁵ and while no particular rights have been declared, it has set a benchmark for member countries. Individual countries have taken additional steps, for example, Finland made access to the Internet a legal and fundamental right for all citizens in 2010.³⁶ By 2015, the government of Finland will ensure that every citizen has a 100 megabit per second (Mbps) broadband connection. France's constitutional council declared Internet access a fundamental right in 2009.³⁷ The UK has taken a slightly different approach. Rather than declaring Internet access as either a legal or fundamental right, Parliament has committed to a minimum connection of 2 Mbps for all homes. This minimum target is lower than the EU's target of 30 Mbps established for achievement by 2020, but still demonstrates a commitment for ubiquitous access.

Jurisdictions outside of Europe have pursued similar measures, for example Australia has determined that the minimum standard for the rollout of the National Broadband Network, which is publicly owned infrastructure, will be universal service of at least 12 Mbps to all premises.³⁸

In Canada, the CRTC³⁹ set a target in 2011 for broadband Internet access services across Canada. By the end of 2015, the CRTC expects all Canadians to have access to broadband speeds of at

³⁵ European Commission, "Broadband coverage in Europe in 2011", Research Report, for the SMART 0027/2011 Project, at 6.

³⁶ BBC News, "Finland makes broadband a 'legal right'", *BBC News*, (1 July 2010), online: BBC News, <<http://www.bbc.co.uk/news/10461048>>.

³⁷ *Supra* note 31.

³⁸ OECD iLibrary, *National Broadband Plans*, *OECD Digital Economy Papers*, No. 181, OECD Publishing, (15 June 2011), at 13.

³⁹ The CRTC, the Canadian Radio-television and Telecommunications Commission, is an independent public authority that regulates and supervises broadcasting and telecommunications in Canada. The CRTC implements the policy objectives set out by Parliament in the *Broadcasting Act* and the *Telecommunications Act*.

least 5 megabits per second (Mbps) for downloads and 1 Mbps for uploads.⁴⁰ In its September 2012 report, CRTC statistics established that in 2011, 72% of households subscribed to 1.5 Mbps broadband Internet service, compared to 68% in 2010, and 54% of households subscribed to services of 5 Mbps or greater (compared to 51% in 2010).⁴¹ While the CRTC also reported that by 2011 virtually all Canadians had access to some form of Internet access, the availability of broadband Internet access to households at speeds of at least 5 megabits per second (Mbps) for downloads, was 83% in 2011.⁴²

It will be difficult to meet the targets set by the CRTC given the gap that currently exists, furthermore there is an adoption challenge needs to be addressed. The 2010 Statistics Canada data⁴³ indicates that of the 21% of Canadians without household access to the Internet, more than half of them, or 56%, are not interested in Internet access. The balance of those without household Internet access are deterred by the cost of the service or the equipment, by the lack of a device to access the Internet, or by a lack of confidence, knowledge, or skills. More households in the lowest income quartile where incomes are less than \$30K per year, reported cost as a barrier. Even where broadband is available access is not always utilized. The individual Internet use and e-commerce component of the Statistics Canada survey data indicates that 20% of individuals over 16 do not use the Internet, and of those, more than half are seniors. Other

⁴⁰ The CRTC has a Three-Year Plan to guide its current mandate, ending March 31, 2015. Of importance to consumers of broadband and Internet services, is the CRTC's responsibility to ensure competitiveness in the marketplace.

⁴¹ Canadian Radio-television and Telecommunications Commission, *Communications Monitoring Report 2012*, (Ottawa, September 2012), at i. <<http://www.crtc.gc.ca>>.

⁴² CRTC, *ibid*, at 157.

⁴³ Statistics Canada, *The Daily*, "2010 Canadian Internet Use Survey", (25 May 2011), <<http://www.statcan.gc.ca/daily-quotidien/110525/dq110525b-eng.htm>>.

barriers to individual use were similar to the household results reported in the 2010 Canadian Internet Use Survey.⁴⁴

While a discussion of a right to Internet access versus Internet access as a human right is beyond the scope of this paper, the essentiality of the Internet does not turn on the distinction between the nature of the right. The Internet has acquired characteristics which would qualify it as an essential service or as essential infrastructure, necessary to realize any Internet rights. This has been affirmed by a number of governments. Frank La Rue, the U.N. Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, summed up the requirement for ubiquitous Internet succinctly:

“access to the Internet is not only essential to enjoy the right to freedom of expression, but also other rights, such as the right to education, the right to freedom of association and assembly, the right to full participation in social, cultural and political life and the right to social and economic development.”⁴⁵

3.2 Canada’s rankings in Internet penetration and adoption

There are a number of ways of measuring Internet penetration and adoption, some of which are more comparable than others. It is, however, a confusing minefield when making international comparisons. A useful OECD ranking is the fixed broadband subscriptions per 100 inhabitants, which includes cable, DSL, fibre and other wired connections. That measure, in 2011, shows Canada ranked 13th, just ahead of the United States at 15th. The Nordic countries are all in the top 15, Switzerland is first at 39.9, and the Netherlands is just behind at 39.1. Canada’s ranking of

⁴⁴ Statistics Canada, The Daily, “2010 Canadian Internet Use Survey”, (12 October 2011), <<http://www.statcan.gc.ca/daily-quotidien/111012/dq111012a-eng.htm>>.

⁴⁵ Frank La Rue, *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression*, United Nations, General Assembly, (10 August 2011).

32.0 means that it is well above the OECD average of 25.6, but well behind the other leaders in fixed broadband subscriptions.⁴⁶

When the abovementioned statistics are analyzed, some unfortunate conclusions can be reached. While fixed broadband penetration continues to increase in Canada, our comparative ranking continues to slip. That would suggest that other nations are gaining traction and building momentum in their ability to develop their digital economy by growing broadband penetration and usage.

Another OECD statistic that assesses the ability of Canadians to participate technologically in a digital world, is the statistic that measures the percentage of households with broadband access. Canada, including the Northwest Territories, Yukon Territory and Nunavut, ranked 8th in OECD countries, as of 2009, with 72.2% of households having broadband access. South Korea ranked first at 95.9% in 2009. Again the Nordic countries all ranked ahead of Canada, as did the Netherlands. An analysis of year over year rankings again indicates that Canada is failing to keep up with the advances that have been made in other countries. In 2004, Canada ranked 3rd, and although advances have continued in Canada, other countries have made proportionately greater strides in provisioning broadband access.⁴⁷ There are likely many factors responsible for the slide of the Canadian ranking. For example, other jurisdictions are finally adopting broadband, catching up and passing Canada. The fact that Canada has neither comprehensive plan nor vision would suggest that the slide is likely to continue or, at best, hold its current position through an uncoordinated effort.

⁴⁶ Supra note 9.

⁴⁷ Supra note 9.

4 GOVERNMENT INITIATIVES

The federal government has spearheaded many efforts designed to drive Internet adoption and access for Canadians. Some of these efforts are described chronologically in the sections below. They are intended to demonstrate that historically, the federal government in Canada has assumed the role of stimulating and ensuring access to the Internet. However, while many of the programs were effective in their own right, taken as a collective, they culminate in the current situation where Canada is without a clear direction and vision, there are 1 in 5 households without access to the Internet, and only half of Canadians are subscribed to broadband at download access speeds of 5 Mbps or higher.

4.1 National Broadband Task Force Report

The National Broadband Task Force, established in 2001 by the then Minister of Industry Brian Tobin, was mandated to map out a strategy for achieving the Government of Canada's goal of ensuring that broadband⁴⁸ services were available to businesses and residents in every Canadian community by 2004. In recognition of the importance of ICT's to Canada's future, and as a way of enhancing the ability of Canadians to access new types of telecommunications-based applications, the Task Force was also "asked to advise on issues related to the continued development and deployment of broadband networks and services in Canada".⁴⁹ At the time, Canada was a leader in the deployment of high-speed Internet access.⁵⁰

⁴⁸ The term broadband includes a broad range of technologies, all of which provide higher data rate access to the Internet. These technologies use wires or fiber optic cables.

⁴⁹ National Broadband Task Force. *The New National Dream: Networking the Nation for Broadband Access*, (Ottawa: Industry Canada, 2001), at 1. <<http://publications.gc.ca/collections/Collection/C2-574-2001E.pdf>>.

⁵⁰ According to a draft report by the Organization for Economic Co-operation and Development (OECD), Korea, Canada and the United States were leaders in overall broadband penetration.

The Task Force's work culminated in the issuance of a report entitled *The New National Dream: Networking the Nation for Broadband Access*. The report recommended that the federal government provide leadership, and respond to national broadband deployment priorities through targeted investments, stimulation initiatives, and content development strategies. Ensuring an effective regulatory environment was also identified as a key priority. The private sector was tagged with the responsibility for leadership in the development and advancement of broadband capability. The Task Force stated a number of principles in the report, intended to serve as a reference point for proposed broadband deployment efforts. The overarching principle was, and remains, compelling:

“We believe, as a matter of urgency, that all Canadians should have access to broadband network services so that they can live and prosper in any part of the land and have access to high levels of education, health, cultural and economic opportunities.”⁵¹

In recommending that “broadband be deployed to and within all Canadian communities, making it available to all business, households, and public institutions”,⁵² the Task Force prioritized the need of the First Nation, Inuit, rural and remote communities to access broadband connectivity, at a price reasonably comparable to that of urban regions, and made deployment recommendations to assist with addressing this need. Finally, the Task Force recognized that Canadians needed equitable broadband access if they were to be able to take advantage of the global marketplace and of the collaborative opportunities offered by a knowledge-based economy.

4.2 *Broadband for Rural and Northern Development*

⁵¹ Supra note 49, at 9.

⁵² Ibid. at 10.

The *Broadband for Rural and Northern Development* (BRAND) program followed on the heels of the Broadband Task Force report in 2002. The *National Satellite Initiative* was launched a year later. Both programs were designed to extend broadband to underserved communities and First Nations reserves. The government acknowledged, even at the time of implementing the programs, that there would still be communities without broadband at the completion of the programs. The BRAND program connected 900 communities that had been previously unserved by broadband connectivity. Note that providing a community with Internet does not necessarily mean that all citizens will have access to the Internet, nor have the necessary digital literacy skills to take advantage of it. The Task Force viewed the Internet as a fundamental resource. There is an obligation upon the government to ensure that sufficient training and Internet skills development programs are delivered.

4.3 *Telecommunications Policy Review Panel*

In 2005, the Minister of Industry ordered a review of Canada's telecommunications framework. In response to that directive a Telecommunications Policy Review Panel was formed, comprised of Dr. Gerri Sinclair, Hank Intven and André Tremblay, all highly qualified by their extensive and varied telecommunications and Internet experience. The members of the panel were appointed to conduct a review of Canada's telecommunications policy and regulatory framework in consultation with interested stakeholders. The panel looked at all aspects of Canada's regulatory and policy objectives and made 127 recommendations which addressed how to make the framework a model for 21st century regulation.⁵³ The panel repeatedly referred to the notion

⁵³ Telecommunications Policy Review Panel, *Telecommunications Policy Review Panel Report 2006*, (Ottawa: Industry Canada, 2006). < [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/tp rp-final-report-2006.pdf/\\$FILE/tp rp-final-report-2006.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/tp rp-final-report-2006.pdf/$FILE/tp rp-final-report-2006.pdf) >

that market forces driving the telecommunications industry in Canada may not be sufficient to ensure ubiquitous access to Internet and broadband capability in Canada. In fact, the panel recognized that government involvement could become necessary, particularly in implementing programs to reach those rural and remote areas where providers are not economically motivated to provide connectivity, acknowledging the competing interests between government and the private sector.⁵⁴ To that end, the panel's first recommendation with regard to broadband asked the government to retain its global leadership in broadband deployment, and immediately start a program "to ensure that affordable and reliable broadband services are available in all regions of Canada, including urban, rural and remote areas, by 2010 at the latest."⁵⁵ That recommendation was a clear acknowledgement that the Government of Canada's previous goal of connecting Canadian communities by 2004 had not been met and the panel recommended, in essence, a six-year extension in achieving that goal. The panel also recommended that "the federal government should develop a national ICT adoption strategy", one of whose objectives being "achieving ubiquitous access to broadband networks and services."⁵⁶

4.4 Economic Action Plan

In response to economic pressure and a sagging economy, the Government of Canada launched the stimulus phase of what it called the *Economic Action Plan*, in 2009.⁵⁷ This "timely, targeted, and temporary" plan was meant to provide stimulus funding for economic growth and recovery.

⁵⁴ "As stated throughout this report, the Panel believes as a matter of general principle the federal government should rely primarily on market forces to achieve Canada's telecommunications policy objectives, but that well-targeted, proportionate government measures should be used in cases where the market fails to do so." Telecommunications Policy Review Panel, *Telecommunications Policy Review Panel Final Report 2006* (Ottawa: Industry Canada, 2006), at Chapter 8-9.

⁵⁵ *Supra* note 53, at recommendation 8-1.

⁵⁶ *Supra* note 53, at recommendation 7-1 and 7-2.

⁵⁷ Canada, *Canada's Economic Action Plan*, Budget 2009, (Ottawa), (27 January 2009).

As a temporary plan, it was to be phased out when the economy recovered. Infrastructure improvements were integral to the plan with a clear objective of strengthening research and technology leadership in Canada. Specific investment areas are reviewed and selected annually; support for Canada's knowledge-economy and for research and education have been included in each iteration of the *Economic Action Plan*. This is not an optimal approach to strategic investments in digital infrastructure.

In 2009, as part of the *Economic Action Plan*, \$225 million was allocated to Industry Canada to develop a strategy to extend broadband coverage in Canada. Industry Canada devised *Broadband Canada: Connecting Rural Canadians*, a three year program that successfully connected 218,000 households.⁵⁸ This broadband program focused on connecting previously unserved or underserved households, recognizing that connecting a community doesn't necessarily provide service to individual Canadians. The CRTC reports that between 2009 and 2011, the availability of fixed broadband (including satellite) to Canadian households increased from 82% to 87%.⁵⁹ Some of this increase can be attributed to the *Broadband Canada* program. However it is clear that further investments, including government incentive programs, will be necessary to ensure that affordable and reliable broadband Internet services are available to all Canadians. Reliance on market forces is not effectively closing the broadband gap.

4.5 Digital Economy Strategy

The most recent effort, and the one which has been speculated as most likely to improve the state of the Internet in Canada, is the Digital Economy Strategy (DES). As early as 2009 the federal

⁵⁸ Industry Canada, *Broadband Canada: Connecting Rural Canadians*, <<http://www.ic.gc.ca/eic/site/719.nsf/eng/home>>.

⁵⁹ *Supra* note 41, at 155.

government announced its intention to develop a digital economy strategy. The initial phase of the plan called for consultations seeking feedback from all interested parties. From May to July 2010, the federal government undertook Digital Economy Consultations which attracted over 2,000 individual and organizational registrants interested in making submissions, and sharing comments and ideas. The objective of the consultations was to assist the federal government in the formation of a plan and strategy for Canada's digital economy future. Although the digital economy strategy has been touted ever since with continual statements of its release date, it has yet to appear.

As noted earlier in this paper, in June 2011 the Governor General announced that a digital economy strategy would be forthcoming. The Minister of Industry, most recently in September 2012, promised a digital economy strategy "by the end of the year".⁶⁰ Canadians await the announcement of this long-anticipated strategy. In the meantime, in the absence of a top-down strategy and vision, many bottom-up efforts are percolating in the digital economy eco-system, managing the development and interconnection of the requisite elements of the digital infrastructure eco-system in Canada. Historically, this has not proven to be as effective a methodology as have leadership and targeted investments.

5 GOVERNMENT OBLIGATIONS/RESPONSIBILITIES

The Canadian ecosystem pertaining to Internet access contains a diverse set of actors: the federal, provincial, and municipal governments and the private sector. These actors operate under obligations defined by jurisdictional responsibility, policy, or legislation. This section

⁶⁰ Government of Canada, Canada News Centre, Speaking Points, The Honourable Christian Paradis, PC, MP Minister of Industry, (28 August 2012), online: <<http://news.gc.ca/web/article-eng.do?nid=692689>>.

provides insight into the role of the various actors, the pertinent policies and policy makers, as well legislative issues related to achieving ubiquitous Internet access in Canada.

5.1 Jurisdiction

The federal Parliament has exclusive jurisdiction over interprovincial works and undertakings related to transportation or communication. This power is granted by Section 92(10) of the *Constitution Act (1867)*⁶¹. The same section is the source of federal authority over telecommunications and television and radio broadcasting. Because the Internet is an interprovincial and international communications system it follows that the Internet would fall under federal regulatory scrutiny. Parliament has delegated that regulatory authority and supervision to the Canadian Radio-television and Telecommunications Commission (CRTC). The CRTC is represented in Parliament by the Minister of Canadian Heritage.

5.2 Telecommunications Regulations

The CRTC is responsible for telecommunications policies and regulatory changes. The CRTC is a creature of statute,⁶² and among other things, has the authority to regulate and supervise the telecommunications service providers and carriers that fall under federal jurisdiction. The *Telecommunications Act* is the source of the CRTC's authority over telecommunications. Section 47 (a) of the *Act* charges the Commission with the responsibility to implement the Canadian *Telecommunications Policy*.

⁶¹ The *Constitution Act, 1867*.

⁶² *Canadian Radio-television and Telecommunications Commission Act* (R.S.C., 1985, c. C-22).

Section 7 (b) of the *Telecommunications Act* states that one of the objectives of the Canadian *Telecommunications Policy* is "to render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada." This follows from the acknowledgement at the beginning of Section 7 that telecommunications plays an essential role in maintaining Canada's identity and sovereignty. Section 7 (h) of the *Act* states the need "to respond to the economic and social requirements of users of telecommunications services". The *Act* broadly defines telecommunications as "the emission, transmission or reception of intelligence by any wire, cable, radio, optical or other electromagnetic system, or by any similar technical system."⁶³

As part of its regulatory authority, the CRTC directed Bell, Telus, and MTS Allstream to use accumulated revenues to connect rural and remote areas with broadband. Further, as a result of Telecom decisions CRTC 2010-637,⁶⁴ CRTC 2010-638,⁶⁵ and CRTC 2010-639,⁶⁶ unserved communities will be receiving access to broadband Internet services. The telecommunications providers will use the funds in their deferral accounts to make the infrastructure available to rural communities; these infrastructure investments will total almost \$422 million dollars. This magnitude of investment should provide unserved areas with high-speed services that will allow more Canadians to access health, education, and government content, and to participate in a digital environment in a meaningful way.

⁶³ *Telecommunications Act* (S.C. 1993, c. 38).

⁶⁴ Telecom Decision CRTC 2010-637, (Ottawa), (31 August 2010). < <http://www.crtc.gc.ca/eng/archive/2010/2010-637.pdf>>.

⁶⁵ Telecom Decision CRTC 2010-638, (Ottawa), (31 August 2010). <<http://www.crtc.gc.ca/eng/archive/2010/2010-638.pdf>>.

⁶⁶ Telecom Decision CRTC 2010-639, (Ottawa), (31 August 2010). < <http://www.crtc.gc.ca/eng/archive/2010/2010-639.pdf>>.

These investments will augment the investments that were made in the now completed Industry Canada Connecting Rural Canadians program,⁶⁷ by continuing to provision access to rural and remote communities that remain unserved by broadband Internet access.

5.3 Security

The *National Strategy for Critical Infrastructure*⁶⁸ refers to critical infrastructure as processes, systems, facilities, technologies, networks, assets, and services that are vital to the well-being of Canadians. It categorizes the information and communication technology (ICT) sector as one of ten critical infrastructure sectors. The strategy further determines that disruption or destruction of what is deemed critical infrastructure “would have a serious impact on the health, safety, security or economic well-being of Canadians or the effective functioning of governments in Canada.”⁶⁹

In Canada, responsibility for strengthening the resiliency of critical infrastructure is shared among all levels of governments and critical infrastructure owners and operators.

Public Safety Canada is responsible for policy development and advice to their Minister on matters of national security. Canada has a national strategy and an action plan for critical infrastructure. The Minister of Public Safety has outlined a cyber security strategy, and has recognized that effective critical infrastructure protection requires coordinated action across industry and at all levels of government.

⁶⁷ See section 4.4, above, for more on the Connecting Rural Canadians program.

⁶⁸ Canada, Her Majesty the Queen in Right of Canada, *National Strategy for Critical Infrastructure*, (Ottawa, 2009), <<http://www.publicsafety.gc.ca/prg/ns/ci/ntnl-eng.aspx>>.

⁶⁹ *Supra* note 68, at 2.

While the government, by its actions to ensure security, has identified the criticality of existing infrastructure, there are no proclamations of the critical or essential need to expand and enhance the infrastructure to meet the growing demands and the reliance of Canadians on the Internet.

5.4 Privacy

While the government has an obligation regarding privacy, and has acknowledged the challenge of privacy in an on-line environment, it is outside the scope of this paper. The assertions of Industry Canada during the Digital Economy Consultations indicated that privacy legislation was an area that would require change in order to enhance and guarantee privacy in a digital ecosystem. Lawful access inherently creates a tension between an individual's reasonable expectation of privacy and the overarching obligations for privacy and security. This tension needs to be carefully balanced.

5.5 Charter Rights

The *Canadian Charter of Rights and Freedoms*,⁷⁰ guarantees everyone the “freedom of thought, belief, opinion and expression, including freedom of the press and other media of communication”. The Internet has become a platform where Canadians can practice their freedom of expression. It is therefore inconceivable that the Internet is not essential infrastructure that is available to all Canadians, as we move into a digital era.

The concept of the Internet as a human right was considered in the context of this paper. A report written for the United Nations Human Rights Council characterizes Internet access as a human

⁷⁰ *Canadian Charter of Rights and Freedoms*, Part 1 of the *Constitution Act*, 1982, being Schedule B to the Canada Act 1982 (U.K.), 1982, c. 11.

right.⁷¹ Human rights are guaranteed rights, deemed as required to fulfill basic needs. Freedom of Expression is a good example of a human right. Internet access may not be a right, in and of itself. Internet access is essential when it is the mode or medium for digitally instantiating Freedom of Expression. Freedom to Education is another good example of a human right. The Internet may one day be the only way to access that education, in essence making the Internet essential to achieving the right, but not the human right itself. The essential necessity of the Internet to access health, education, social and economic content and services may give citizens a right to the Internet, but it is difficult to assess Internet access as a human right.

Whether Internet access is a human right or simply essential to humanity, it is interesting to note that in a recent UK decision⁷², two appeal court judges have ruled that banning anyone from the Internet is an "unreasonable and disproportionate" restriction. The decision by Mr. Justice Collins and Judge Nicholas Cooke QC signals judicial recognition of how pervasive digital communications are in an era when a multitude of services can be obtained online; further suggesting that access to a wired computer at home has become a basic human right.

Clearly there are precedents and factors which imply that while it is not a human right, Internet access is essential to enable specific human rights in the digital age.

5.6 Access

The Community Access Program (CAP), a program delivered through Industry Canada from 1995 to 2012, successfully provided public computer and Internet access to communities across

⁷¹ Supra note 31.

⁷² Owen Bowcott, "Internet ban on convicted sex offender 'unreasonable', rule judges", *The Guardian*, (13 November 2012), online: <<http://t.co/hH6IfBP8>>.

the country. The CAP program helped provide affordable public access, training, digital skills, and technical awareness. The federal government decided that the CAP program had less relevance to the government's current priorities than it once had, and the CAP funding was discontinued in 2012.

Given the adoption challenges noted earlier in this paper, some kind of follow-on, or replacement program is still necessary to provide Canadians with the requisite level of Internet literacy skills, to encourage adoption by seniors, and to assist with access to computers or mobile devices.

It is clear that government intervention is necessary for broadband access to become ubiquitous. But, the federal government is not the only player and source of funding. Provincial and municipal governments have also recognized that investment in infrastructure will act as a stimulant to economic growth.

Alberta's SuperNet is an example of how direct involvement can provide hundreds of communities access to high-speed broadband otherwise not available. Alberta's ground-breaking public-private partnership connected 429 communities using "2,000 kilometres of wireless and 13,000 kilometres of fiber optic cable."⁷³ With an original provincial government investment of \$193 million in 2001, and partnerships with Bell Canada and Axia NetMedia, the network is open-access (also known as structural separation), meaning that entrepreneurial businesses can access the network at a uniform low cost and resell services to retail and residential consumers.⁷⁴ Not only does the network benefit rural residents, but also allows small businesses to become ISPs, with the ability to re-sell access and services to residential and commercial customers.

⁷³Alberta SuperNet, *Harnessing the SuperNet Advantage*, online: <http://www.servicealberta.gov.ab.ca/pdf/Harnessing_the_SuperNet_Advantage.pdf>.

⁷⁴ *Ibid.* at 3.

Open-access networks, or structurally separated networks, are a concept that was considered by the Telecommunications Review Panel, and recommended for adoption in some applications in Canada where it would make economic and regulatory sense. Open-access involves separating the infrastructure ownership from the right to use and market the infrastructure. In a network setting, the network elements belong to one entity. That entity is not a reseller of the network services. One of the outcomes of this kind of network is the assurance of fair competition, and the ability of smaller service providers to attain non-discriminatory terms of use to market and resell services to consumers and businesses. This model of network ownership can be advantageous when providing access to rural communities, but is less necessary when providing the access within the communities themselves. The Telecommunications Policy Review Panel recommended the open-access network methodology for rural and remote areas in Canada, due to the increased cost and complexity of building and extending backhaul networks to remote and rural communities. Once connected, the last mile, or access to households, is an easier and less expensive problem to solve.

British Columbia offers another interesting example of a successful public-private partnership and the open-access network implementation. Network BC, a dedicated project office under the British Columbia Ministry of Management Services, entered into contract negotiations with Telus, the largest ISP in British Columbia.⁷⁵ Under the direction of the Premier's Technology Council, Network BC was able to leverage provincial contracts for government IT services into an expansion of the broadband backbone into unserved areas of the province. Launched in 2001 the objective was to ensure that the infrastructure was available to grow a knowledge economy.

⁷⁵ British Columbia, Office of the Chief Information Officer, Network BC, *Strategic Collaborations*, online: <http://www.cio.gov.bc.ca/cio/networkbc/strategic_collaborations/index.page?>.

Since 2005, Network BC has managed to ensure that 93% of the population has access to high-speed Internet services. With recent deferral account investments directed into rural community connections, Telus will further contribute to the BC government's objective of ensuring that 100% of the population has access to high-speed Internet. Like Alberta's SuperNet, the backbone is open-access allowing independent ISPs to provide "last mile" solutions at low, competitive prices that would not be available without the government's intervention.⁷⁶

The Alberta and BC examples demonstrate that open-access networks would be a useful methodology for continuing to grow and increase the availability of broadband Internet in Canada.

The Quebec government, in a measure to ensure the research and education community within the province had the most competitive and current digital infrastructure, provided capital funding in 2001 to RISQ (Réseau d'informations scientifiques du Québec),⁷⁷ to build and operate an advanced network that would serve the province. As a condition of funding, the province elicited a contractual commitment that ongoing funding to maintain and expand the network would be the responsibility of the universities and CEGEPs within the province. The network continues to expand to serve remote areas of the province through services fees levied to the large educational institutions in urban centres.

Some municipalities have undertaken the responsibility for ensuring reliable, high-speed access to the Internet as a form of competitiveness for attracting businesses and talent. In Fredericton, New Brunswick, capital was invested to provide high-speed broadband access to the business

⁷⁶ Ibid.

⁷⁷Hewlett Packard, Large Enterprise Business, *Success Story*, online: <http://www.hp.com/canada/portal/enterprise/case_studies/risq_09_03.html>.

sections of the city. The ongoing cost to operate the network is borne by the businesses using the high-speed Internet access. The city then took the progressive approach of using the residual capacity of the infrastructure to offer free wireless access throughout the city, a measure which also provides benefit to the municipal taxpayer.

Coquitlam, British Columbia recognized that to participate in a vibrant knowledge-based economy, a fibre infrastructure to provide affordable Internet access was required. This was in a direct response to their research which concluded that Canadians are disadvantaged compare to the rest of the world with respect to Internet access fees, which are 5 times higher than other comparator countries; and that Internet download speeds were also lagging behind the rest of the world by at least a factor of ten.⁷⁸

Both cities, Fredericton and Coquitlam, were able to support a strategic decision with an initial capital infusion while allowing the private sector, through service revenues, to fund the ongoing support for the infrastructure. It is evident that both municipalities required political vision to realize competitiveness in a knowledge economy, and acted upon the vision in collaboration with private sector partners to deliver high-speed fibre optic and wireless networks for the future benefit of their communities.

5.7 Implications for the Private Sector

The final evaluation of the Community Access Program⁷⁹ suggests that not only is the Internet essential infrastructure which will enable Canadians to participate in a digital and knowledge

⁷⁸ Rick Adams, *Coquitlam, British Columbia, Discover the Advantage!*, (Presentation at the Cybera Summit, October 2012). <http://www.cybera.ca/webfm_send/175>.

⁷⁹ Industry Canada, Audits and Evaluations, *Final Evaluation of the Community Access Program*, online: <<http://www.ic.gc.ca/eic/site/ae-ve.nsf/eng/03131.html>>.

economy, but that the Government of Canada has a view that the minimum benchmark for access speed is 1.5 Mbps. The private sector was acknowledged as a valued partner in the government's ability to achieve its policy objectives. That was also demonstrated in the Connecting Rural Canadians program, where the private sector partnered in building the infrastructure funded by Industry Canada. The government will need the participation and development support of the private sector to close the broadband penetration gap that exists in rural and northern areas.⁸⁰

A major hurdle that will need to be overcome is the one of competing interests. The objectives of the government and the private sector are clearly not aligned, and are, in fact, often orthogonal. The government has interests that are Canada-centric and for the public good, ensuring that broadband is accessible to all Canadians and serving the objectives of their constituents. The private sector on the other hand has divergent interests: maximizing shareholder value, supporting other lines of business, and ensuring profitability for their shareholders whose primary consideration may not be to ensure that Internet infrastructure is accessible to all Canadians. In some areas of Canada public-private partnerships or more direct government involvement will be required to ensure that the needs of Canadians can be served with broadband Internet access and services. Models for addressing the competing interests have been presented in this paper, for example, capital infusion by the government to build the infrastructure with the ongoing maintenance and support costs funded by user fees as was implemented by Fredericton and Coquitlam,⁸¹ suggesting that these competing interests need not be seen as barrier to a successful public-private partnership to ensure ubiquitous Internet access.

5.8 Investment Obligations

⁸⁰ Supra note 57.

⁸¹ See section 5.6, above, for more on these two municipal models.

We know that the Internet is constantly changing, growing, and transforming. As a result, traffic and data have been growing exponentially, currently increasing at a rate of about 40% annually.⁸² For some time now, infrastructure has been increasing in capacity and capability, following Moore's Law, which states that the semiconductor capacity doubles every twenty-four months.⁸³ Moore's Law has proven to be a reliable tool to forecast network capacity growth and certainly suggests that further research and ongoing investments are required in networks and other infrastructure. If data and traffic also double every twenty-four months (roughly 40% compounded annually), it would seem clear that there is a need to ensure that Internet capacity and the technologies that support the infrastructure and services at least double every twenty-four months to support the continued growth.

An alarming observation was made in a June 2011 report to the OECD's Working party on Communication Infrastructures and Services policy. The authors noted that the advancements of network capability has trended towards linear over the last few years.⁸⁴ They also noted that if this trend is not reversed, and significant investments are not made in infrastructure capacity development, the infrastructure will not be able to keep up with the traffic and data growth at some point. Any government strategy designed to support the growth and advancement of a digital economy in Canada will need to integrate this understanding into a private sector investment policy framework. Just as traffic studies and engineering developments inform the investments that governments make in roads and highways, so too should Internet traffic studies

⁸² TeleGeography, Research Services, *Global Internet Geography*, online: <<http://www.telegeography.com/research-services/global-internet-geography/index.html>>.

⁸³ Intel, "Excerpts from A Conversation with Gordon Moore: Moore's Law", online: <ftp://download.intel.com/museum/Moores_Law/Video-Transcripts/Excepts_A_Conversation_with_Gordon_Moore.pdf>.

⁸⁴ Working Party on Communication Infrastructures and Services Policy, *Internet Traffic Exchange, Market Developments and Policy Challenges*, October 2012.

and technological advancements clarify the requirements of government investments in the essential infrastructure that channels digital traffic. Investments in advanced network technologies are critical.

6 OTHER JURISDICTIONS

The Broadband Commission for Digital Development,⁸⁵ an international commission engaged in broadband advocacy work, promotes the adoption of broadband-friendly practices and policies for all, believing that everyone can and should take advantage of the benefits offered by broadband. Their 2012 report recognizes a clear need for policy leadership for establishing strong national visions among stakeholders and prioritizing the deployment of broadband. A growing number of countries now have a national broadband plan or strategy in place; by mid-2012, some 119 countries had a policy in place.⁸⁶ Other jurisdictions demonstrate the benefits of national support and leadership in ensuring and increasing broadband access and penetration.

In this section, some comparators are studied with a view to establishing instances where Canada could benefit from the experiences of other jurisdictions. South Korea is a leader in broadband Internet access and chose to become a knowledge economy with a clear strategy as to how to accomplish that objective. Australia faces geographical hurdles similar to Canada's, and has encountered similar barriers to adoption. Having recognized its lagging global position in the digital economy and subsequently establishing a clear vision to become one of the leaders in the digital economy by 2020, Australia has set out to advance Australia's digital potential. The Netherlands has implemented strategies to turn natural resource wealth into the investments

⁸⁵ See also *supra* note 32.

⁸⁶ The Broadband Commission for Digital Development, *The State of Broadband 2012: Achieving Digital Inclusion for All*, September 2012, at 35.

which will make the Netherlands a knowledge economy and global hub. The comparator jurisdictions are all leaders, placing in the top 20 worldwide in Internet usage based on population. 2012 statistics confirm that the Netherlands has 93% penetration, Australia has 89%, Canada is just behind at 83%, and South Korea at 82.5%. National literacy is 99% in all 4 jurisdictions.⁸⁷

6.1 South Korea

South Korea is generally recognized as the leader in Internet access, connection speed, and price.⁸⁸ The area of South Korea is only 1% that of Canada, consequently South Korea is not as rich in natural resources as Canada. The percentage of South Korean GDP that is derived from industry is 39.2% as compared to Canada's 28.5%.⁸⁹ South Korea experienced 3.6% GDP growth in 2011, compared to Canada's GDP growth of 2.4%. As communications is a critical component for a successful industry sector, South Korea initiated a telecommunications transformation circa 1960, when it realized that it was lagging the world average telephone penetration at approximately 1 telephone per 300 inhabitants.⁹⁰ Government policy continues to support ICT investments. A recent OECD report states that South Korea is one of 3 countries whose ICT R&D investment was more than half its total R&D, thus it is not surprising that South Korea leads the world in Internet access speed.⁹¹ According to Akamai's most recent 2012 statistics the average Internet connection speeds in South Korea are 14.2 Mbps. These can peak

⁸⁷ Internet World Stats, *Usage and Population Statistics*, June 30, 2012, online: <<http://www.internetworldstats.com/stats.htm>>.

⁸⁸ Supra note 9.

⁸⁹ Central Intelligence Agency, *The World Factbook*, online: <<https://www.cia.gov/library/publications/the-world-factbook/fields/2012.html#ca>>.

⁹⁰ Tim Kelly, Vanessa Gray and Michael Minges, *Broadband Korea: Internet Case Study*, International Telecommunications Union, (2003), at 1.

⁹¹ OECD, *The Future of the Internet Economy, A Statistical Profile*, (June 2011 update) at 29.

at 46.9 Mbps, and they are almost 5 times faster than the global average of 3.0 Mbps.⁹² Canada doesn't make the top ten in either connection speed or peak speed rankings. Internet access is also more affordable in South Korea than in Canada, where a 100Mbps connection costs US\$18.65 monthly, according to 2011 OECD broadband statistics.⁹³ The closest comparator in Canada is Shaw which offers a 50Mbps connection for US\$86.54.⁹⁴

Between 2000 and 2004 the International Telecommunications Union (ITU) compiled telecommunications market reports which studied the state of the Internet in 20 countries. While the studies may be somewhat dated, the 2003 report on South Korea provides relevant information which offers insight as to why they are leading the world in broadband penetration and speed.⁹⁵ Noteworthy, from the study, was the creation of a separate Ministry for Information and Communications, which provides the policy framework and oversight on the public-private partnership model for broadband infrastructure. The private sector contributes the majority of the funding for the ongoing growth of the infrastructure. The South Korean government stays clear of the market side by limiting its involvement to providing financial support for the core of the public Internet, providing ICT training to ensure adequate uptake, and providing access for marginalized groups. Ongoing funding for the core infrastructure is guaranteed by policy; all license fees for using the common infrastructure must be invested back into the public network and not into other non-ICT government initiatives. When comparing Canada against the success factors noted in the study, there is a good match on a number of factors: the level of education nationally allows for adoption of ICT skills, the urban versus rural population is split with 80%

⁹² Akamai, Volume 5, Number 2, *The State of the Internet*, 2nd quarter, 2012 Report.

⁹³ Supra note 9.

⁹⁴ Ibid.

⁹⁵ Supra note 90.

of the population of South Korea located in urban areas, the availability of ICT equipment, and the financial ability to fund the capital infrastructure. However, the shortfall in Canada's ability to adopt the methodology undertaken by the South Koreans rests in the area of leadership, competitiveness, and geographic differences. South Korea's success in Internet use and adoption is a result of leadership and vision, as well as strong relationships and cooperation with private sector partners. There is a high level of competition on the service provider side, and this allows for better pricing and better choice for consumers. Because South Korea is so much smaller than Canada, the scale of providing broadband Internet access to all residents is quite different. Additionally, the population density is quite high, with many South Koreans living in apartments; making the problem of broadband penetration in urban areas easier to address in South Korea.

6.2 *Australia*

While not yet a leader in Internet access, connection speed, or price, the Australian government envisions being among the world's leading digital economies by 2020, and has made practical efforts to achieve that vision. Notably, in 2007, the Australian government replaced the Commonwealth Department of Communications, Information Technology and the Arts with the Department of Broadband, Communications and the Digital Economy (DBCDE).

Australia faces many of the same types of geographic and population density challenges as Canada. Australia is the sixth largest country in the world, and 90% of the population live in less than 1% of the country.⁹⁶ The population of Australia is clustered along the coasts, primarily

⁹⁶ Supra note 89.

along the eastern and south-eastern coastlines due to the climate. Canada is the second largest country in the world, yet 90% of the population of Canada lives within 160 kilometres of the border with the United States.⁹⁷

The National Broadband Network (NBN) was announced by the Rudd government in April 2009.⁹⁸ The NBN, a network to be funded jointly by the government and the private sector, using an open-access network, similar to those deployed in BC and Alberta albeit on a much larger scale, is intended to provide affordable high-speed broadband to all Australians. The NBN will be deployed using three technologies – fibre, fixed wireless and satellite.

In its 2009 digital economy discussion paper, the Australian Government acknowledged that

“the key elements to a successful digital economy are a Government that is digitally aware and enabling; industry that is digitally confident, innovative and skilled; and a community that is digitally empowered and literate.”⁹⁹

Most recently, in 2011, the Minister for Broadband, Communications and the Digital Economy launched the National Broadband Economy Strategy,¹⁰⁰ a comprehensive strategy, which outlines eight digital economy goals all of which support the overarching goal of ensuring that Australia is at the forefront of digital economies on the world stage. Online engagement and participation by households and businesses, and the expansion of digital goods and services delivery, are all critical elements of the strategy to enhance the ability to participate in a global

⁹⁷ Ibid.

⁹⁸ Minister for Broadband, Communications and the Digital Economy, Joint Media Release, *New National Broadband Network*, (Canberra, 7 April 2009). <http://www.minister.dbcde.gov.au/media/media_releases/2009/022>.

⁹⁹ Australian Government, Department of Broadband, Communications, and the Digital Economy, *Australia's Digital Economy: Future Directions*, Commonwealth of Australia, (2009), online: <www.dbcde.gov.au/digital_economy/final_report> at 3.

¹⁰⁰ Australian Government, Department of Broadband, Communications and the Digital Economy, *National Digital Economy Strategy*, (2011), <http://www.nbn.gov.au/files/2011/05/National_Digital_Economy_Strategy.pdf>.

digital economy in Australia. Deployment of the National Broadband Network is integral to achieving success of the National Broadband Economy Strategy and ensuring digital inclusion for all citizens.

The situation in Australia is in contrast to the evolution of the digital economy strategy in Canada. The consultation process parallels the Canadian effort, but the strategy that was announced in 2011 has allowed Australia to move forward to achieving anticipated productivity and competitiveness gains resulting from the digital economy, and to reaping the opportunities that are presented by digital participation and adoption. The National Broadband Economy Strategy presents clear measures of success for governments, businesses, and the community, and the government has made a commitment to benchmark the impacts and value achieved in order to drive further effectiveness of innovation and engagement in the digital economy.¹⁰¹

6.3 The Netherlands

The Netherlands determined that to become one of the most innovative knowledge economies in the world, they would need to invest in the best ICT infrastructure. They knew that to compete on a scientific level, their scientists would need access to the best ICT infrastructure. The Dutch innovators recognized that the drivers were data growth, collaborative opportunities, and the increased use of the Internet by science and social science communities. The government came to realize the economic advantages and impacts of Internet infrastructure. The vision implemented in the Netherlands included a knowledge infrastructure that is a public rather than private investment in information and communications technology. The Dutch, from early on,

¹⁰¹ Supra note 99, at 55.

understood that investments in knowledge infrastructure would pay huge dividends, and had the distinct advantage of having gas revenues which could be invested in strengthening and growing the knowledge infrastructure. And they had the foresight to make those investments.¹⁰² The concept of using natural resources revenues to fuel a digital economy advantage is one that other nations, like Canada, could employ in order to gain economic and competitive advantage and support the transition to a knowledge based economy.

7 IS THE INTERNET ESSENTIAL INFRASTRUCTURE?

Direct evidence has been presented in this paper which supports the essentiality of Internet infrastructure. The Internet drives significant economic benefits. The Internet is contributing to GDP, stimulating growth, and creating jobs. The Internet is the backbone of many social networks which not only provide platforms to connect and maintain relationships, moreover they create value and wealth, and stimulate a digital economy. Social interaction has been revolutionized. Knowledge retention and growth has been transformed by the Internet. The growth and advances in service offerings relating to banking and finance, shopping, health services, social networking, and digital media have made these services essential to the daily lives of many Canadians. The Internet supports critical infrastructure within other sectors such as energy, transportation, finance, water, public safety and manufacturing.

¹⁰² Gordon Cook, *Building National Knowledge Infrastructure—How Dutch Pragmatism Nurtures a 21st Century Economy*, The Cook Report on Internet Protocol, (2010).

Additional evidence has been presented which tacitly supports that the Internet is essential infrastructure. By its own admission in the *Consultation Paper on a Digital Economy Strategy for Canada*¹⁰³ the Government of Canada recognized that

“all Canadians should have access to high-speed networks as digitally savvy citizens, consumers, workers, entrepreneurs and artists — to connect them to the potential that the digital economy offers.”

Provincial and municipal governments have engaged in building networks and providing digital services. Internationally, nations are making considerable financial and policy changes to provide ubiquitous Internet access, are committing to building national networks, and are investing in the digital skills that will connect and empower their citizenry. Some nations have made Internet access a fundamental right; others have decreed minimum Internet access speeds for all households. The United Nations Human Rights Council has resolved that access to the Internet and the right to express oneself on the Internet are basic human rights. Being connected is critical.

There is abundant support in previous sections of this paper for the fact that high-speed, high-capacity broadband connections to the Internet are essential for growing a knowledge-based economy. The Internet is essential infrastructure.

8 RECOMMENDATION

As we near the end of 2012, Canada is one of the few countries without a national broadband plan, policy or strategy in place, this is in spite of announcing the intent of creating a digital economy strategy two and a half years ago. Given the essentiality of the Internet, statutory obligations such as the *Telecommunications Act* compel the government to produce, and to

¹⁰³ *Supra* note 7, at 19.

ensure the implementation of, a digital economy strategy. That strategy must ensure ubiquitous access to broadband Internet for Canadians.

The continual growth of the Internet and the aggressive investments being made internationally emphasizes the urgent need for a plan, a bold plan, with stretch objectives. Like Australia, Canada needs a government that is digitally aware and enabling. The Government of Canada must develop a plan which, at the very least, maintains Canada's position in critical OECD metrics which include broadband penetration and adoption, speed of access, and cost of service. Further slippage in Canada's OECD ranking must be viewed as unthinkable.

A digital economy strategy is about more than just infrastructure, and requires many integrated components: stimulation of ICT, stimulus to foster a digital economy, modernizations of privacy law and copyright law, stimulation of private sector and ICT sector research partnerships, development of a regulatory environment that will protect consumers and support innovation, and policies and programs that will encourage and support adoption and use of the infrastructure.

The impetus for the digital economy strategy is economic prosperity and global competitiveness for Canada in a digital and knowledge economy. The digital economy strategy must begin by identifying a principal, ideally by identifying a separate ministry responsible for the digital economy. This would show the commitment of the federal government to taking a leadership role in delivering on its responsibilities and growing the economy. The digital economy work needs to be given high visibility and high importance under a ministry of its own. It will get neither if merely rolled into an existing ministry as a mere branch. This approach has been demonstrated successfully in other jurisdictions. This newly identified ministry should have responsibility for telecommunications and broadcasting, the digital economy, and the ICT sector.

The ministry should focus on driving an agenda to cultivate a digital economy. The current Industry portfolio is overly broad; hiving off the digital economy and digital infrastructure would allow the new ministry to concentrate on developing the digital technologies and infrastructures required to grow a knowledge-based economy in Canada. The responsibility for the industrial portion of GDP is too great for a single ministry, and would be better shared.

The following detailed recommendations for the digital economy strategy have been formulated using the information compiled in the writing of this paper; they focus primarily on advancing the essential Internet infrastructure required to sustain the digital economy strategy for Canada.

8.1 Infrastructure Recommendations for the Digital Economy Strategy

Internet infrastructure, both wired and wireless broadband, is fundamental to supporting a digital economy. The 2010 Canadian Internet Use Survey¹⁰⁴ indicates that there are 21% of Canadian households without access to the Internet.

Internet access should be ubiquitous. Canada needs a broadband network that connects all households, business, and communities. The digital economy strategy must include a plan in which government would support building the infrastructure and ensure that service providers and users are responsible for sustaining the infrastructure. This would reduce competition at the infrastructure level, guarantee that infrastructure is built where it is needed and not just where it is profitable,¹⁰⁵ and stimulate competition at the services level. Using an open-access model, as

¹⁰⁴ The Canadian Internet Use Survey (CIUS) is a Statistics Canada survey that measures household access to the Internet and individual online behaviours including electronic commerce. The CIUS results are used by the federal government to evaluate policies and programs related to uptake and barriers to use and high-speed access.

¹⁰⁵ In a highway analogy, the current scenario would see two competing carriers providing parallel highways. Inherent inefficiencies and unserved areas result. The objective would be to have one highway that serves all Canadians.

the Australian government has done, the government should make the necessary investments to provide all Canadians with broadband Internet access. The infrastructure and its development could be managed by a third party; a not-for-profit like CANARIE Inc.¹⁰⁶ would be an efficient model. An alternative implementation is possible; CANARIE could have its mandate broadened beyond serving the research and education community to become the national network for all Canadians with incremental investment to broaden the reach and increase the reliability of its existing infrastructure.

The infrastructure development requires government investment; these could be financed by dedicating a share of natural resource revenues, or tax revenues, to the expansion of broadband infrastructure, as well as wireless and satellite service where those technologies are the most economically viable. Acknowledging that highways were integral to productivity and competitiveness of the economy¹⁰⁷ the Government of Canada has provided and continues to provide funding for construction of highways in Canada,¹⁰⁸ despite the fact that building and maintaining highways is largely a provincial jurisdiction. Transportation of digital goods has developed a critical mass. The digital infrastructure to transport those digital goods and services is essential and must be addressed by the federal government.

Regulatory measures should be imposed where necessary. As the oversight body ensuring compliance with legislation, the CRTC should be held accountable for ensuring that target

¹⁰⁶ CANARIE is a third-party delivery agent of Government that currently operates an ultra-high-speed optical infrastructure to support research and education in Canada.

¹⁰⁷ Library of Parliament, *Federal Participation in Highway Construction and Policy in Canada*, Allison Padova, (20 February 2006), online: <<http://www.parl.gc.ca/Content/LOP/ResearchPublications/prb0569-e.htm>>.

¹⁰⁸ For instance: the *Trans-Canada Highway Act*, 1949, was the authority for the construction of the Trans-Canada highway. This highway construction was cost-shared by the provincial and federal governments.

speeds established by virtue of *Telecom Regulatory Policy CRTC 2011-291*¹⁰⁹ are met, and for continuing to monitor market gaps in order to address them with funding mechanisms if required. Target speeds should regularly be benchmarked against other OECD countries, and amended as and when necessary. Regulatory measures should be imposed to prevent prohibitive access costs for Canadians if an open-access model does not drive more competitive pricing for all Canadians. Regulatory measures are also required to monitor the practices of usage-based billing, a practice which stifles innovation and is sub-optimal for consumers and businesses. Bandwidth caps impose a deterrent to richer digital experiences for Canadian, limit the growth of Internet capacity, and serve to protect the carriers' non-Internet offerings such as cable television.

As part of the digital economy strategy, the government should address the barriers to adoption that have been identified. Not only should the government continue to monitor those barriers, and set targets to eliminate them to the extent possible, but the government should put in place programs to develop digital skills, and programs that will encourage the use and adoption of the Internet. The importance of establishing and monitoring benchmarks, collecting accurate and timely statistics, and analyzing trends cannot be overstated; they are critical indicators which should be used to inform future investments for maximum impact.

Failure to develop and deliver an advanced and comprehensive vision and strategy will lead to Canada's OECD rankings continuing to slide. More concerning is the potential loss of economic prosperity for Canadians as the digital age evolves. This paper has examined current Canadian

¹⁰⁹ Telecom Regulatory Policy CRTC 2011-291, (Ottawa), (3 May 2011), online: <<http://www.crtc.gc.ca/eng/archive/2011/2011-291.htm>>.

initiatives and has compared them to initiatives in other jurisdictions; it clearly advocates a call to action towards creating a digital economy strategy for Canada, including an inclusive and essential infrastructure component. The recommendations in this paper are quite attainable under the correct leadership; that leadership must come from the federal government.

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