The Future of Broadband Internet Access in Canada

CRTC Telecom Notice of Consultation 2013-551

Introduction

Cybera is a not-for-profit, technology-neutral agency responsible for accelerating high-tech adoption in Alberta. One of Cybera's core roles is the operation of Alberta's Research and Education Network, called CyberaNet. This is the dedicated network for unmetered, not-for-profit traffic used by Alberta's schools, post-secondary institutions and business incubators to aid innovation, enterprise and ingenuity.

Cybera receives both provincial and federal funding to spearhead pilot projects that improve efficiencies, international-level research, and the competitiveness of Canadian institutions and companies. It is guided by a strategic leadership team, and is home to some of the world's top cloud computing experts who work together to build cloud infrastructure, data storage, and advanced networks solutions.

Drawing on this expertise and public service mandate, Cybera is pleased to provide the following response to the CRTC Telecom Notice of Consultation 2013-551 regarding the review of Canada's wholesale services.

Key Concept

A recent report from the OECD, entitled 'Network Development in Support of Innovation and User Needs,' (OECD 2009) highlights the case for government investment in broadband infrastructure:

> *'High-speed broadband networks are a platform supporting innovation throughout the economy today in much the same way electricity and transportation networks spurred innovation in the past. Future innovation in many sectors will be linked to the availability of high-speed, competitive data networks and new applications they support.'*[1]

Cybera recommends that new wholesale services should be included in the CRTC's mandated regulation, particularly with respect to fibre to the premises (FTTP). By asking the CRTC to regulate this technology, we can ensure that Canadians have affordable choices while protecting network neutrality.

[1] OECD (2009) Working Party on Communication Infrastructure and Services Policy: Network Development in Support of Innovation and User Needs

Appendix 1, Question 2:

Explain the current market conditions associated with mandated wholesale services, as well as the market trends that are likely to influence these conditions in the years ahead. Identify the impact of these conditions and trends on different consumer segments (e.g. residential/business, urban/rural, enterprise/small business) and on downstream retail services. Be specific about any regional differences, as well as the evolution of market forces in the associated markets.

Canada's Current FTTP Standards - Canada's fibre to the premises (FTTP) industry is not currently regulated, which means competition is severely restricted and FTTP consumers have limited or no choice of internet providers. In the future, fibre that is capable of carrying 1,000 Mbps+ speeds will become the backbone on which Canada's digital economy grows and thrives. Fibre to the premises technology and infrastructure will deliver fast internet to Canadian homes and businesses and provide the foundation to advance our digital workforce, research and creative activities.

For Canada's digital economy to grow, all Canadians need unmetered broadband internet. This means competitive access to next-generation FTTP infrastructure and technology. Canada significantly trails other OECD countries when it comes to FTTP penetration (Figure 1), and this is reflected in its poor overall internet speed ranking (36th; http://www.netindex.com). Other countries have made the strategic decision to prioritize FTTP adoption (Figure 1). If Canada is to be globally competitive, it needs to follow suit and establish regulations in the wholesale FTTP services market.

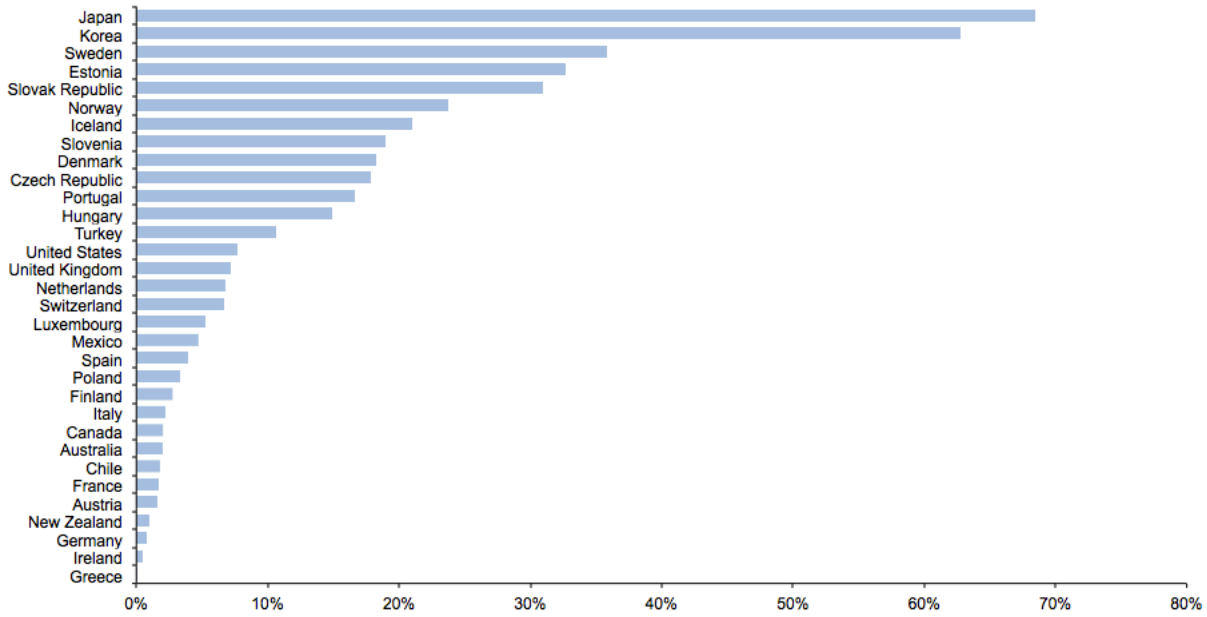
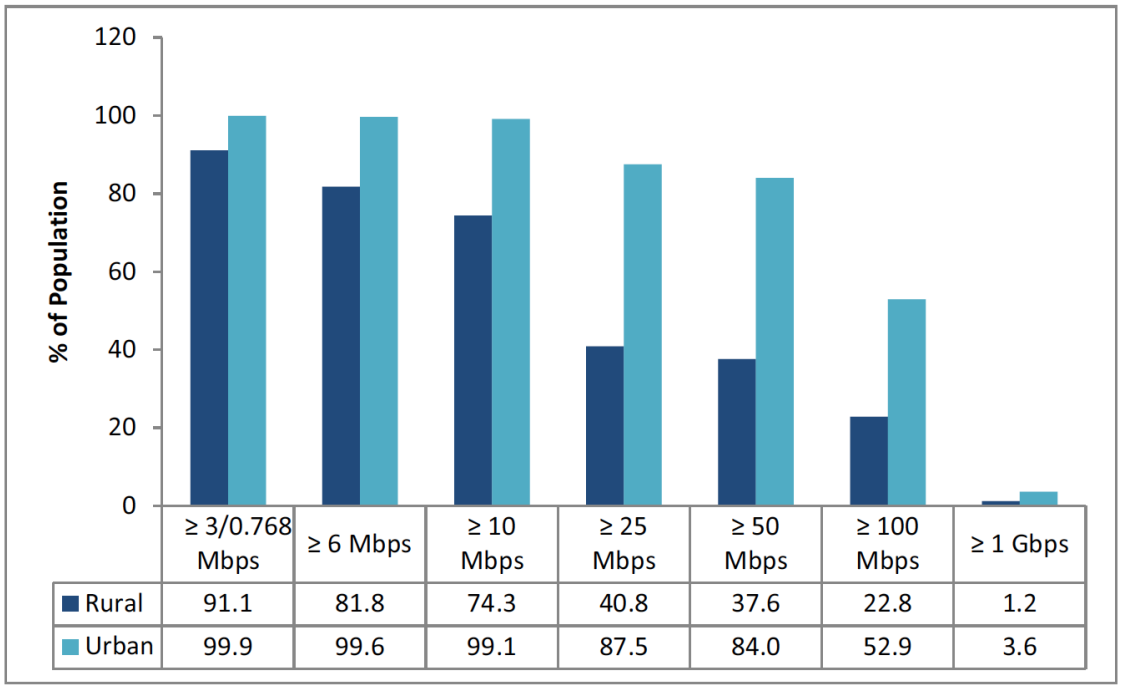


Figure 1. International percentage of fibre connections from OECD broadband statistics [www.oecd.org/sti/ict/broadband]

With its basic service objective (Decision 2011-291), the CRTC established a baseline internet availability target of 5 Mbps download and 1 Mbps upload rates for all Canadians by 2015. These targets should now be considered too low, based on expected uses of the internet in the near future. The basis for setting such targets should be the ability of Canadians to use the internet interactively, and not just as passive consumers. As such, upload speeds have to be higher to allow consumers to carry out such digital activities as videoconferencing and telecommuting. Moreover, these baseline numbers should be updated frequently to match leading international benchmarks.

Urban vs Rural Disparity - The impact of increased consumer demand for faster internet speeds and shared digital services will also significantly impact Canadians living in rural regions. The digital divide between urban and rural markets will continue to grow without careful consideration, and it is critical that rural residents be given the same opportunities as urban Canadians with respect to the adoption of internet services. As demonstrated in Figure 2, the disparity between broadband internet availability in urban and rural regions in the USA is significant. For example, internet speeds of 10-25 Mbps are available to 99.1% of urban residents compared to only 74.3% of rural residents.



	≥ 3/0.768 Mbps	≥ 6 Mbps	≥ 10 Mbps	≥ 25 Mbps	≥ 50 Mbps	≥ 100 Mbps	≥ 1 Gbps
Rural	91.1	81.8	74.3	40.8	37.6	22.8	1.2
Urban	99.9	99.6	99.1	87.5	84.0	52.9	3.6

Figure 2. Broadband availability by urban and rural in the United States (as of June 2012)[2]

Currently, there is a lack of high-quality, high speed and affordable internet service in rural environments. Regulating and unbundling the deployment of FTTP to rural towns will help to ensure that rural residents, businesses and cultures thrive and are not lost to large urban centres. The rural town of Olds, Alberta, provides an excellent example of a pro-active approach to combating the digital divide. This community built its own fibre network (O-Net) and started its own internet service provider as a means to attract technology companies to the town. It now offers an internet speed of a gigabit per second at a low commercial price, and expects 50% of the population to connect in 2014.

By prioritizing the deployment of fibre to rural communities, it is expected that the impact of the digital divide on rural communities and businesses can be minimized.

[2] Office of Science and Technology Policy & The National Economic Council. (2013) Four Years of Broadband Growth. *The White House.*

Appendix 1, Question 4B:

Explain whether additional wholesale HSA services, including FTTP facilities, should be mandated.

Yes. Cybera believes that regulation of the FTTP wholesale services provided by incumbent carriers is essential for creating a competitive digital environment. This will provide maximum benefit for Canadians, while still ensuring a fair rate of return to the builders of the fibre networks (and recognizing the capital investment they have made). Next-generation FTTP technologies and infrastructure can robustly deliver symmetric fibre to homes and businesses, without restrictions.

The FTTP industry is currently not regulated, and the few large incumbent carriers (i.e. large telecommunications and cable companies) that can provide this service are set to become the sole providers of fibre to Canadians. Without FTTP wholesale service regulation, there is no incentive for these companies to allow competitors to gain access to their customers' premises (e.g. home or business) and to provide Canadians with the freedom to choose their internet service provider and broadband internet rates. Having no regulations may also create serious consequences for net neutrality as a sole provider may be tempted to restrict access to certain content providers, thereby limiting a consumer's right to choose.

Unmetered fibre for all Canadians is becoming increasingly important as more devices and applications become internet-enabled. While Cable and DSL networking technologies have the potential to deliver high internet speeds to the homes and businesses of Canadians, they typically fall short due to factors such as distance to the node, number of connected premises and crowded network traffic.

Figure 3 below shows the growth in bandwidth access in Australia, clearly indicating a trend towards speeds requiring FTTP. If Canada wants to remain economically competitive with — and have a comparable standard of living to — other developed nations, FTTP deployment will be required.

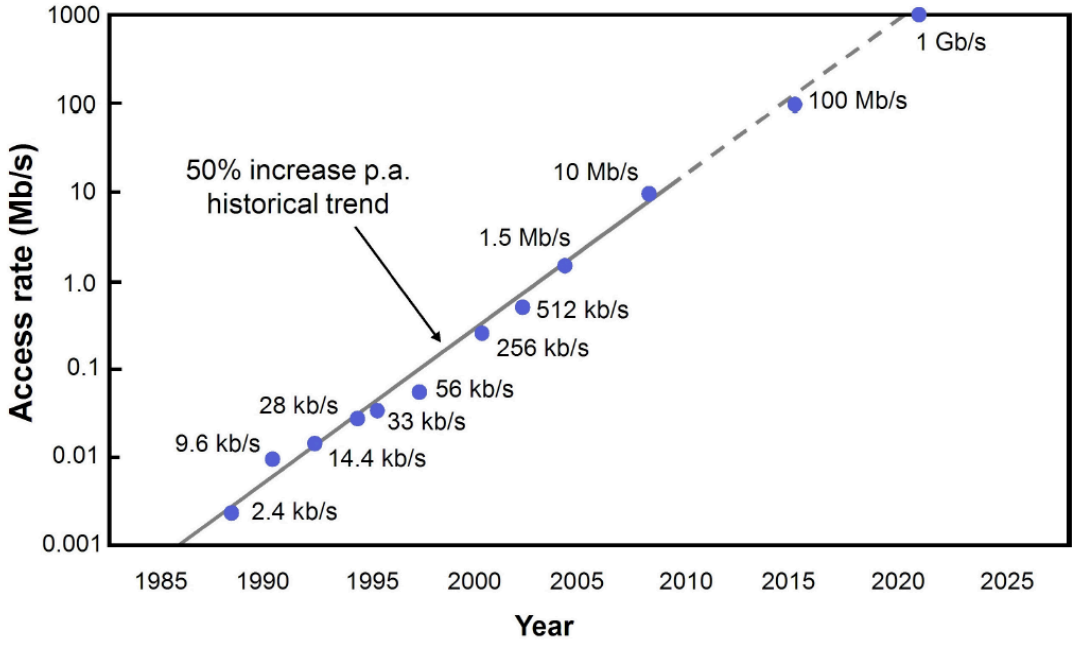


Figure 3. Australian bandwidth access rates[3]

[3] Tucker, RS. (2010) Broadband Facts, Fiction, and Urban Myths. *Telecommunications J of Australia.*

Appendix 1, Question 4B cont:
Explain how the mandating of any proposed additional service would facilitate the development of a competitive Canadian broadband market while also providing incentives to invest in innovative networks?

Previous CRTC telecom decisions (e.g. 2010-632) which regulated the wholesale service industry made cable and dial-up internet services more affordable in Canada. Given the country's low population density, service-based competition is preferable to facility-based competition. Unbundling FTTP wholesale services will facilitate this. Giving small providers mandated access to FTTP infrastructure will facilitate market competition and ensure consumers gain access to unmetered fibre at reasonable rates.

Large incumbent carriers will need to invest in FTTP one way or another to remain competitive. Current network technologies are reaching the end of their lifecycles. As Canadians demand more bandwidth for activities that require high-speeds (such as telecommuting, telehealth and video conferencing) as well as above the network services (such as cloud storage of their digital files), there is a strong incentive for large incumbent carriers to incorporate FTTP infrastructure and technology.

Furthermore, by acting now in the early stages of FTTP adoption, the CRTC will promote the development of open network technologies and topologies that are flexible, offer room to grow, and provide the highest potential for future innovation through new applications.

Appendix 1, Question 4B cont:
Provide an overview of the potential socioeconomic impacts that may result from mandating or not mandating access to FTTP wholesale services for consumers, competitors or incumbent carriers.

Regulating FTTP technology in Canada at an early stage will level the playing field and ensure a predictable and fair market for service providers to compete. Providing a stable environment will allow telecommunication providers to forecast their return on investment, removing the risk associated with an uncertain regulatory environment and thereby encouraging investment in, and rapid development of, FTTP technologies.

The potential socioeconomic benefits are well-documented by research organizations and advocacy groups who demonstrate the importance of broadband penetration for a nation's economic development. The OECD[4] advocates for open-access FTTP networks, as it directly affects both the national economy and essential services such as health, transportation and education. Multiple[56] studies show that broadband has a positive effect on a nation's GDP and household income, as it increases personal productivity and allows for more flexible work arrangements, as well as home-based business and distance-learning opportunities.

Rural communities face a serious challenge in maintaining their economic viability as populations move to urban centres. Without access to reliable and affordable connectivity via the internet, this trend will continue, eroding a key element of Canadian culture.

[4] OECD (2009) Working Party on Communication Infrastructure and Services Policy: Network Development in Support of Innovation and User Needs
[5] Danish Energy Association (2010) The socio-economic value of digital infrastructures. Copenhagen Economics.
[6] Ericsson, Arthur D. Little, and Chalmers University of Technology (2013) Socioeconomic effects of Broadband Speed.

Appendix 1, Question 4C:
Should the provisioning of additional new wholesale services be mandated? Explain why the provisioning of any such additional wholesale service is appropriate and furthers the implementation of the telecommunications policy objectives set out in the Telecommunications Act. In addition to other relevant matters, explain how the mandating of any proposed additional service would facilitate the development of competition while also providing incentives to invest in innovative networks. Provide an overview of the potential economic and social impacts that may result from either mandating or not mandating access to such services for consumers, competitors, or incumbent carriers.

Any new wholesale service (wired or wireless) that affects internet access and bandwidth should be carefully monitored to ensure that it is beneficial to consumers and provides them with a platform and opportunities to innovate.

As long as location remains a barrier to fair access to high-speed internet in Canada, there is a need to regulate FTTP. The reason for this is simple — it is not the high-speed internet itself that is of interest to consumers, but the profusion of additional services that can be provided over their networks. These additional services, such as videoconferencing and streaming, digital storage and file-sharing, are the drivers of competition, and can have an enormous social and economic impact on individuals and companies. They are also the services that will eventually rationalize the investment in more costly infrastructure, especially in non-urban areas. It is worth noting in particular that the profusion of cloud-based services makes this need for high-speed ubiquitous access even more acute.

In rural areas, competitive market forces are often insufficient to guarantee residents an internet service that is high-speed and affordable. A potential solution would be to regulate access to long-haul fibre infrastructure in rural and remote regions such as the Mackenzie Valley Fibre Link. Giving internet service providers and network operators competitive access to fibre infrastructure gives them the incentive to provide services to rural Canadians at affordable rates.

Appendix 1, Question 4F:
Should more simple and efficient pricing approaches apply to certain wholesale services and/or carriers, and if so, what are they? What principles should apply in setting markups for mandated wholesale services? Are other changes warranted regarding how the Commission sets prices for mandated wholesale services (e.g. freezing rates for certain legacy services, maintaining the premium for fibre-to-the-node (FTTN) wholesale HSA services, establishing a more efficient rate setting process for HSA, continuing the application of an I-X adjustment, eliminating any distinctions between wholesale business and residential HSA services)?

Cybera has observed significant disparity in the internet prices paid by Alberta public institutions. For example, one school reported paying $185 per Mbps at a time when counterpart colleges in the United States were paying as little as $1 per Mbps. In 2011, Cybera instituted an Internet Buying Group to help increase the awareness among public institutions of the availability of competitive rates, and to provide access to those rates. This Internet Buying Group has introduced a form of competition for Alberta's educational institutions, and has helped bring prices down to under $5 per Mbps.

The current technical infrastructure environment unintentionally facilitates monopolistic practices such as customer lock-in. Some level of rate-setting would therefore be appropriate, while still allowing for a reasonable return on investment for investors in FTTP wholesale service. Cybera has also found through its experience with the Internet Buying Group that bandwidth prices in Alberta are dropping faster than expected. This is due to the increased number of users in the Internet Buying Group and the price of

bandwidth decreasing as very large providers move into Canadian cities. Cybera has moved from an annual to bi-annual review of pricing as a result, and suggests similar reviews of rate-setting by the CRTC be held at shorter intervals.

There is also a need to regulate advertised internet rates versus the actual data rates achieved by consumers. Consumers are often misled by inconsistencies in the way data rates are described or committed. For example, right now services can be sold based on the bandwidth that *might* be available to an individual consumer (if no other users are on the network). This is rarely the case. The advertised data rates should reflect the minimum bandwidth available at peak hours.

Appendix 1, Question 5:
Discuss the appropriateness of establishing a process to measure the performance of the wholesale services framework. Discuss which performance objectives ought to be included, and identify any qualitative and quantitative indicators or metrics (e.g. market share, network investments) that the Commission could use to measure the performance of its wholesale service policies.

A process to measure the performance of the wholesale services framework is required and should be based on a flexible economic benchmark. This process would monitor the fast-changing cost structure associated with high-speed internet access services.

In this system, targets would be updated annually based on average internet costs and speeds within a peer country, such as another G8 nation. Other performance indicators such as annual targets for the creation and entry of new companies in the internet wholesale services sector are also necessary, to evaluate the effectiveness of the overall framework.

Appendix 1, Question 6:
Indicate whether the Commission should conduct another comprehensive review of wholesale services and if so, what is the appropriate timing of such a review?

Due to the rapidly changing technology landscape, a review of wholesale services associated with high-speed internet access should occur at least every three years, and ideally more frequently still. This will ensure that Canadians are receiving the highest quality and best priced internet, and that the country as a whole remains a leading nation when it comes to technology adoption.