Appendix A: Canada

Overview

ITIF Rank: 11

Subscribers per Household[1]	0.65	**Incumbent Government Owned**	0%
Internet Users in Millions[2]	22	**Local Loop Unbundling:[3]**	
Internet Users per 100 Inhabitants[4]	67.89	**Full Copper Loop**	Yes
Average Speed in Megabits per Second (Mbps)[5]	7.6	**Shared Copper Loop**	Yes
Price Per Month of 1 Mbps USD PPP[6]	6.5	**Bitstream**	Yes
Percent of Urban Population[7]	81	**Cable**	Yes
Population Density per sq. km[8]	3	**Fiber**	No

Geography and Demography

Canada has a population density of only 3 people per square kilometer (as compared to 31 in the United States).[9] Yet, the majority of its citizens are clustered in the major metropolitan centers of Vancouver in the west, Toronto in the Midwest, and Ottawa and Montreal in the east, with the percentage of urban population nearly equal to the United States (80 percent versus 81 percent, respectively).[10] At the end of 2006 the country's broadband penetration reached nearly 100 percent in urban areas and 78 percent in rural areas.[11]

Policy

In 1993 the Canadian government established initiatives to spur broadband development and increase Canadian citizens' "connectedness." From 1996 to 2006 the Canadian government invested nearly $250 million each year[12] to promote on-line access, adopting incentives for companies to create indigenous Internet content, expediting e-commerce, and promoting cross-agency e-government services.[13] In 2001 the government's National Broadband Task Force created two programs to provide targeted grants for public-private partnerships in rural communities to create broadband infrastructure. These are the Broadband for Rural and Northern Development (BRAND) in 2002 and the National Satellite Initiative (NSI) in 2003.[14] The Canadian government designed BRAND as a pilot program to provide broadband access to 900 rural communities, but it continues to allocate satellite capacity to rural communities via the NSI and, in 2006, created the Ubiquitous Canadian Access Network (U-CAN) program to provide targeted grants to communities to establish broadband access where commercial operators are not providing services.[15]

Rural Access

In 2002 the government charged the Communications Research Centre Canada (CRC), part of Industry Canada, with researching, developing, and testing innovative broadband technologies that would be best suited to providing

Rural Access (*continued***)**

access in rural areas.[16] In its 2006 report Industry Canada's Telecommunications Policy Review Panel determined that 1.5 million Canadians would be left without broadband connectivity without further government support and that the government should set a goal of providing broadband access to 98 percent of Canadian households by 2010.[17] It recommended that the government must complement market forces with well-targeted government initiatives, particularly focusing on communities in areas that the market is unlikely to serve.[18]

Some examples of the government's support for rural access include BRAND funding of $80 million to eligible communities for broadband infrastructure projects, such as British Columbia's SPAN/BC (Shared Provincial Access Network); Alberta's SuperNet, a public-private partnership to link schools, libraries, healthcare facilities, and government offices; Saskatchewan's CommunityNet, a public-private partnership to provide broadband service to public sector institutions; Manitoba's "Rural and Northern Telecommunications Infrastructure" and "High-Speed Internet Access for Public Institutions" programs, Ontario's "Rural Economic Development (RED) and "Connect Ontario: Broadband Regional Access (COBRA)" programs; and Québec's "Villages branches du Québec" program to deploy broadband to schools and municipalities.[19] In another example, in 2004 the Canadian government gave $155 million of satellite capacity to the government of British Columbia, Broadband Communications North (a broadband service provider), Grassy Narrows First Nations, and the Kativik Regional Government to deploy broadband services allocated through a license agreement between the government and Telesat Canada.[20]

In addition, in 2006 Inukshuk Wireless, a joint venture between Bell Canada and Rogers Communications, launched the first phase of a WiMAX network covering over 5 million households in selected areas across Canada. Bell and Rogers used their existing cell towers to install the network with spectrum the government had previously licensed to them. The government's licensing arrangement stipulated that the provider had to make the service available to at least 25 unserved rural areas by 2007 and to 50 by mid-2008. Bell Canada is offering the service as "Sympatico High Speed Unplugged" for $45 CAN per month for 512Kbps downstream (or, for $15 CAN more, 3 Mbps). Rogers is calling its service "Portable Internet" and is charging $49.95 CAN per month for 1.5 Mbps. These prices are relatively high for broadband in the Canadian market, but are targeted to rural areas where broadband might otherwise not be available.[21]

Competition

Although the Canadian government has continued to focus on promoting broadband access to rural communities through the use of targeted subsidies, it also relies on market forces. Until recently, to ensure competition in the market, the Canadian Radio-Television and Telecommunications Commission (CRTC) required telecommunications service providers to give their competitors access to their facilities. However, in 2006 the Canadian Telecommunications Policy Review Panel recommended relaxing the open access regulations of the 1993 Telecommunications Act to limit regulation only to essential facilities. Thus, in April 2007 the government announced that it would continue to deregulate the telecommunications market, including allowing incumbent providers to set prices in markets where competitors are providing fixed telephony services via other facilities (such as wireless or cable). The government also would not regulate (forebear from regulation) in markets where at least 2 carriers service 75 percent of residential customers. Accordingly, the major telecommunications service providers – Bell Canada, Aliant, Telus, and SaskTel, asked the CRTC to forebear from regulating their services.[22]

Cable broadband subscribers are increasing in Canada and cable is most popular in the Western provinces and territories and in large communities. Cable is providing strong facilities-based competition to digital subscriber

Competition (*continued*)

line (DSL) and cable companies provided cable modem services as early as 1996.[23] By 2007 cable continued to lead DSL in percentage of broadband subscribers (52 to 48 percent, respectively).[24] From 2005 to 2006 cable modem subscribers increased by 15 percent for all four major cable companies.[25] Although the CRTC has mandated both resale and third-party access to cable and DSL facilities, the primary competitors are the incumbent cable and telephony carriers.[26] The four major cable service providers are Shaw Cablesystems, with 36 percent of the cable broadband market in 2006, Rogers Cable, with 34 percent, Vidéotron with 21 percent, and Cogeco, with 9 percent.[27]

Fiber

The rollout of fiber-to-the-home (FTTH) has been slow in Canada, perhaps because of the high penetration of both cable and DSL broadband services.[28] However, in an agreement with British Columbia, Telus deployed fiber networks in 113 remote communities in 2006 with speeds of 15-30 mbps.[29] In addition, Bell partnered with the Alberta government to build the AlbertaSupernet, a broadband network for government offices, schools, health-care facilities, and libraries using fiber-optic technology.[30]

Demand

Of the many programs funded by the government, two that have been most successful are the SchoolNet program, which linked all of the country's schools and libraries to the Internet, and the Community Access Program (CAP), which provides daily public access to the Internet to 100,000 Canadians. In addition to government programs, the popularity of high-bandwidth Internet activities also is generating demand. Internet users in Canada reported increasing interest in several online activities that require broadband access, including online gaming (24.4 percent), music downloads (23.3 percent), and education and training (22.9 percent).[31] Consequently, all of the major providers are increasing bandwidth as well as offering content to further spur demand. Bell Canada is deploying very high speed digital subscriber line (VDSL) in Toronto and will extend high-speed Internet services to rural and remote areas of Ontario and Quebec, which will allow it to offer digital television service to these subscribers. In 2006, Bell had approximately 1.8 million subscribers to its video services. Bell also offers subscribers access to one of the most popular portals in Canada – the Sympatico.MSN.ca portal – in collaboration with Microsoft.[32] Telus is expanding into triple play services and rolled out Telus TV and Pay Per View in 2006, along with integrated digital wireless voice, data, and Internet.[33] The regional telephony providers also are moving into triple play, such as MTS Allstream – the main provider in Manitoba – and SaskTel, the telecommunications provider in Saskatchewan.[34] Not surprisingly, cable providers, which already offer their customers television content, also are offering triple play offerings. For example, Shaw and Vidéotron offer bundled services with high-speed Internet, digital television, and video-on-demand (VoD), and Shaw also providers Direct-to-Home (DTH) satellite broadband.[35] Similarly, Rogers and Cogeco both offer voice telephony over cable as well as VoD.[36]

ENDNOTES

1. OECD measures penetration on a per capita basis because comprehensive data on household penetration is generally unavailable. ITIF has used average household size as a multiplier to convert June 2007 OECD per capita penetration data to household penetration data. It should be noted that one problem with this method is that the OECD data likely also includes some DSL business subscribers.

2. International Telecommunications Union, "Internet Indicators: Subscribers, Users, and Broadband Subscribers,"

International Telecommunications Union ICT Statistics Database, 2006 <www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#>.

3. Unbundling is a policy by which regulators require incumbent telecommunications operators (those with dominant market status who control access to the telecommunications infrastructure) or cable companies to give their competitors access to raw copper pairs, fiber, or coaxial cable networks so that they can install their own transmission equipment at the incumbent's central office (local exchange). *Full unbundling* requires the incumbent to make all copper pair frequencies or fiber networks available to competitors. *Shared access* to the local loop requires the incumbent to make the "high" frequency bands (those that carry data, but not voice) of the copper pair available to its competitors, allowing them to offer xDSL broadband services. *Bitstream access* requires incumbent operators to allow competitors access to the incumbents' equipment at their central office. *Cable access* enables competitors to use cable companies' coaxial cable local loops and *fiber access* requires telecommunications operators to give competitors access to their fiber local loops.

4. International Telecommunications Union, "Internet Indicators: Subscribers, Users, and Broadband Subscribers," *International Telecommunications Union ICT Statistics Database*, 2006 <www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#>.

5. Our methodology for calculating broadband speed in the ITIF Broadband Rankings involves averaging the speeds of the incumbent DSL, cable and fiber offerings provided in the OECD's April 2006 "Multiple Play," report, with each assigned a weight according to that technology's respective percentage of the nations overall broadband subscribership, as reported in the OECD's "Broadband Statistics to December 2006."

6. USD price per bit (PPP) of the fastest available technology is calculated from the broadband offerings examined in the OECD's "Multiple Play: Pricing and Policy Trends" report.

7. The World Bank, "Information and Communications for Development 2006," (2006): 172.

8. United Nations, "World Population Prospects: The 2006 Revision Population Database," 2007 <esa.un.org/unpp/>.

9. Ibid.

10. The World Bank, "Information and Communications for Development 2006," (2006): 172.

11. Canadian Radio-television and Telecommunications Commission, "CRTC Telecommunications Monitoring Report," July 2007 <www.crtc.gc.ca/eng/publications/reports/policymonitoring/2007/tmr2007.pdf>.

12. Robert D. Atkinson, "Unsatisfactory Progress: The Bush Government's Performance on E-Government Initiatives," (Washington, DC: The Progressive Policy Institute, October 2004): 3.

13. Rob Frieden, "Lessons from Broadband Development in Canada, Japan, Korea, and the United States," *Telecommunications Policy 29* (2005): 605.

14. Industry Canada, "Chapter 8: Connectivity: Completing the Job," *Telecommunications Policy Review Panel Final Report 2006* (2006): 3.

15. Industry Canada, *Telecommunications Policy Review Panel Final Report 2006*: <www.telecomreview.ca/epic/site/tprp-gecrt.nsf/en/rx00062e.html#T4>.

16. Paul Budde Communication Pty Ltd, "Canada - Broadband Market - Overview, Statistics & Forecasts," *Telecommunications and Information Highways* (Bucketty, Australia: 2007): 3.

17. Industry Canada, "Chapter 8: Connectivity: Completing the Job," *Telecommunications Policy Review Panel: Final Report 2006* (2006): 6-8.

18. Ibid: 7.

19. Ben Veenhof, Prabir Neogi, and Bryan van Tol, "High-Speed on the Information Highway: Broadband in Canada," (Statistics Canada: September 2003): 20.

20. Industry Canada, "Government of Canada Announces Broadband Access Via Satellite for 52 Remote Communities," May 20, 2004 <www.ic.gc.ca/cmb/welcomeic.nsf/cdd9dc973c4bf6bc852564ca006418a0/85256 a5d006b972085256e9a00725a04!OpenDocument>.

21. Eric Bangeman, "Canadian WiMAX Network Launched," *ars technica* April 2, 2006 <arstechnica.com/news.ars/post/20060402-6507.html>.

22. Paul Budde Communication Pty Ltd, "Canada - Broadband Market - Overview, Statistics & Forecasts," Telecommunications and Information Highways, (Bucketty, Australia: 2007): 4-5.

23. Industry Canada, Chapter 8: Connectivity: Completing the Job," *Telecommunications Policy Review Panel Final Report 2006* (2006): 3.

24. Paul Budde Communication Pty Ltd, "Canada - Broadband Market - Overview, Statistics & Forecasts," *Telecommunications and Information Highways* (Bucketty, Australia: 2007): 2.

25. Ibid: 8.

26. Ben Veenhof, Prabir Neogi, and Bryan van Tol, "High-Speed on the Information Highway: Broadband in Canada," (Statistics Canada: September 2003): 16.

27. Paul Budde Communication Pty Ltd, "Canada - Broadband Market - Overview, Statistics & Forecasts," *Telecommunications and Information Highways* (Bucketty, Australia: 2007): 8.

28. Ibid: 16.

29. Ibid: 17.

30. Ibid.

31. Ben Veenhof, Prabir Neogi, and Bryan van Tol, "High-Speed on the Information Highway: Broadband in Canada," (Statistics Canada: September 2003): 10.

32. Paul Budde Communication Pty Ltd, "Canada - Broadband Market - Overview, Statistics & Forecasts," *Telecommunications and Information Highways* (Bucketty, Australia: 2007): 13.

33. Ibid: 14.

34. Ibid: 15.

35. Ibid: 8.

36. Ibid: 8-11.