

Canada's Usage Based Billing Controversy: How to Address the Wholesale and Retail Issues

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After ten years of policy neglect, Canada is no longer a global leader in broadband networks. The author attributes this decline to insufficient competition among internet service providers (ISPs)—a situation which in his view will be aggravated by the 2010 Canadian Radio-television and Telecommunications Commission (CRTC) decision to impose usage based billing (UBB) on wholesale internet access. While many countries have UBB, Canada is one of the few where nearly all ISPs impose overage charges once consumers exceed their data cap. By international standards, this has left Canadians with high prices, poor service and few options.

Canada's large ISPs often point to network congestion concerns to justify data caps, but the author argues that the two are only loosely related. He proposes a method for calculating the actual costs of transporting data that allows him to challenge the justifications for overage charges and to argue that large ISPs are using UBB to impede competition rather than curb congestion.

The paper suggests targeted policy and regulatory solutions for both wholesale and retail UBB, including rescinding past CRTC decisions on the matter and establishing billing practices that will allow independent ISPs to compete. In his view, greater telecom competition, not a fear of network congestion, should drive the Canadian UBB debate going forward. Among the initiatives he proposes to further competition are the relaxation of foreign ownership restrictions and the development of national broadband initiatives.

Introduction

I. Setting the UBB Record Straight

A. Telecom Competition: Decades of Debate

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Introduction

In early 2011, over 450 000 Canadians signed a petition calling for an end to the common practice of data caps on internet service, frequently referred to as usage based billing (UBB).¹ This public backlash ensued when the Canadian Radio-television and Telecommunications Commission (CRTC)² permitted Canada's largest internet service providers (ISPs) to implement UBB on their wholesale internet access sales. The concern was that wholesale data caps would prevent independent ISPs from providing unlimited plans, leaving Canadians with fewer options and higher prices for internet services.

In response to the public's reaction, the federal government rejected the CRTC decision,³ pressuring the Commission to delay

1. OpenMedia.ca, "Send the CRTC a Message: Canadians Won't Stand for Telecom Price Gouging" (2011), online: Stop the Meter <<http://www.stophthemeter.ca>>.

2. The CRTC is an independent public body charged with overseeing Canadian broadcasting and telecommunications systems. See CRTC, "About the CRTC" (14 April 2011), online: CRTC <<http://www.crtc.gc.ca>>.

3. See "CRTC Must Reverse Internet Usage Ruling: Clement", *CBC News* (3 February 2011), online: CBC News at paras 1-2 <<http://www.cbc.ca>>.

implementation for at least 60 days so that it could review the decision on the merits.⁴ The Commission followed up with a public hearing in July 2011, where consumers, businesses, telecommunications companies and other lobby groups were invited to speak on the matter.⁵ The final CRTC decision, which is expected to be released in the fall of 2011, holds the promise of an amended policy but its narrow focus on *wholesale* UBB is likely to leave many dissatisfied. Indeed, the UBB issue is, at its core, about broader competition concerns over internet access services in Canada. These concerns reflect a longstanding desire to foster greater broadband competition through government-mandated access service for independent third party providers and the ongoing tussle over the rules of such access.

On the specific matter of UBB, there are two distinct matters rolled into one. The first is wholesale UBB, through which large incumbent⁶ internet service providers such as Bell and Rogers impose usage based billing systems on independent ISPs. This may constrain the ability of independent ISPs to differentiate their retail services. The second matter is retail UBB, whereby large incumbent providers impose usage based billing on their retail customers. Both of these matters are linked to a third, broader one: the general state of telecom competition in Canada. This paper proposes targeted policy solutions on all three matters.

The discussion and analysis are divided into two parts. Part I discusses several of the rationales for usage based billing and challenges the assumptions that underlie them. Large ISPs often argue that UBB is a reasonable response to network congestion, but this paper asserts that the two are only loosely related. A comparative analysis of Canadian UBB practices with those of other countries demonstrates that Canada is lagging behind other jurisdictions. I also provide calculations showing

4. See Laura Payton, "Use-Based Billing Could Hurt Economy: Clement", *CBC News* (1 March 2011), online: CBC News at paras 3, 5 <<http://www.cbc.ca>>.

5. CRTC, Telecom Notice of Consultation, CRTC 2011-77-1, "Review of Billing Practices for Wholesale Residential High-Speed Access Services" (17 March 2011), online: CRTC at para 2 <<http://www.crtc.gc.ca>>.

6. That is, those ISPs which dominated the market until local competition was introduced.

that UBB pricing by large Canadian ISPs is disproportionate to the actual costs of data transmission.

Part II expands on my recommendations for wholesale UBB, retail UBB, and the broader matter of internet competition. On wholesale UBB, I propose that the CRTC re-evaluate its past decisions, and I suggest alternative approaches that will allow independent ISPs to differentiate their services. For retail UBB, I recommend that additional guidelines be imposed on ISPs to prevent its use for anticompetitive purposes. Finally, I suggest ways to facilitate more telecom competition by encouraging foreign competitors to enter the market and spearheading national broadband initiatives. I conclude that a broader public strategy is needed to foster a more robust competitive environment for internet access services in Canada.

I. Setting the UBB Record Straight

A. Telecom Competition: Decades of Debate

The UBB debate in Canada may have caught politicians and policy makers by surprise, but it reflects a decades-long controversy over how to foster optimal telecom competition. This debate goes back to the early 1960s when telecom regulators began encouraging new competitors and prohibiting dominant providers from entering into nascent markets such as internet access.⁷ While it was originally thought that reliance on a single provider would best foster universal access and quality networks, in reality such reliance curtailed innovation and left consumers and businesses to face high prices. Today, both large and small providers compete across all service sectors, including wireline and wireless telephone, long distance, and internet access.

In recent years, competition concerns have focused on high-speed broadband internet services. More specifically, constraints on broadband

7. Tim Wu, *The Master Switch: The Rise and Fall of Information Empires* (New York: Knopf, 2010). Wu's examination of the birth and development of the telecom and entertainment industries reveals that the growth of telecom networks occurred largely within a monopolistic environment.

competition have arisen largely from the critical link between the end user (or retail customer) and the ISP, otherwise known as the “last mile”. This link, usually a copper telephone line or cable connection to the home, is the most coveted part of the network because the ability to provide an end user with internet services depends on last mile access to that user.

A growing body of research has focused on how to foster competition without requiring each ISP to duplicate the last mile by establishing its own link to the customer. Such a link entails enormous costs, which are a significant financial barrier to new entrants. In response to this last mile problem, scholars and regulators have proposed alternative regulatory rules that would require incumbent ISPs to make their last mile facilities available to third party competitors. This approach, often referred to as “open access” or “local loop unbundling”, removes duplication and facilitates the entry of new competitors while also maintaining marketplace incentives to invest in new broadband networks.

In 2009, Professor Yochai Benkler completed the most comprehensive study to date on alternative regulatory approaches to open access.⁸ Benkler reviewed dozens of studies and concluded that open access models allow greater competition and lower consumer prices.⁹ South Korea, for example, is frequently recognized as a global broadband and telecommunications leader. The South Korean model emphasizes the relationship between regulatory bodies, incumbent broadband providers and the unbundling of services as being vital to the nation’s progress. This has allowed independent Korean providers, such as Hanaro, to provide broadband services using their own digital

8. Yochai Benkler, “Next Generation Connectivity: A Review of Broadband Internet Transitions and Policy from Around the World” (2009), online: Federal Communications Commission <<http://www.fcc.gov>>.

9. *Ibid* at 75. *Contra* Jerry A Hausman & Gregory Sidak, “Did Mandatory Unbundling Achieve Its Purpose? Empirical Evidence from Five Countries” (2005) 1:1 Journal of Competition Law and Economics 173. Hausman and Sidak argue that unbundling is not useful, based on evidence from several countries that have weak, highly contested and dysfunctional unbundling regimes.

subscriber line (DSL) networks while leasing network space from major providers.¹⁰

This example is not unique. In the French marketplace, having just one unbundled provider raised broadband market penetration by 1.1 percent short-term and 5.9 percent long-term.¹¹ Unbundled providers in France will often reinvest their profits into their own fibre systems and local incumbents' loops—likely as a result of competitive pricing, high quality service and successful marketing. Similarly, the Organization for Economic Co-operation and Development (OECD)¹² has found that unbundling has a significant positive effect on broadband market penetration rates.¹³

Notwithstanding this body of research, Canadian policy has thus far rejected a full unbundling framework. Instead, the CRTC has promoted “facilities-based” competition designed to increase new network investment. Despite the hope that new entrants would invest in these networks, CRTC Commissioners have acknowledged that the facilities-based policy has failed. At the July 2011 UBB hearing, CRTC Vice-Chair Len Katz said:

I guess I come from the position that we, the Commission, have already recognized there is a need to create competition, more competition in order to protect Canadians, and facilities-based competition is not yet here. So it's our job to find a vehicle to create that

10. See Kenji Kushida & Seung-Youn Oh, “The Political Economies of Broadband Development in Korea and Japan” (2007) 47:3 *Asian Survey* 481.

11. David Sraer, *Local Loop Unbundling and Broadband Penetration* (12 November 2008) [unpublished, archived at Princeton University], online: Princeton University <http://www.princeton.edu/~dsraer/arcep_04.pdf>. “Broadband market penetration” refers to the percentage of a population that subscribes to internet services. Sraer states that the results from his study demonstrate almost a complete standard deviation in penetration rates.

12. OECD, “Our Mission” (2011), online: OECD <www.oecd.org>. The OECD is an international organization whose mandate is to help governments deal with economic, social and environmental challenges through collaborative policy-making.

13. See John De Ridder, “Catching Up in Broad-Band—What Will it Take?”, online: (2007) OECD Digital Economy Papers 133 <<http://www.oecd.org>>.

competition and, in the simplest terms, it is to create an environment where broadband would be made available to a third party through a lease arrangement.¹⁴

These comments point to a possible Canadian middle ground that avoids full unbundling but supports new entrants by mandating the provision of wholesale internet services. Indeed, the particular rules associated with mandated wholesale internet services sit at the heart of the regulatory debate over UBB.

B. UBB and Network Congestion

(i) A Decade of CRTC Congestion Concerns

UBB supporters have long pointed to concerns about network congestion as a key rationale for imposing data caps on subscribers. The argument is easily understood. Network capacity is limited and congestion on the network negatively affects all subscribers. Thus, the argument runs, imposing measures designed to limit network congestion will prevent the small number of “heavy” users, who contribute most to the congestion, from adversely affecting the large number of “light” or “average” internet users, whose use has a more limited impact.

The link between UBB and network congestion dates back to 2000, when the CRTC first approved a request by Shaw and Videotron to impose volume usage rate restrictions for Third Party Internet Access (TPIA), the wholesale service offered by cable internet providers.¹⁵ At the time, cable internet was a shared service, and the potential for one end user to affect the service of a neighbouring user was widely recognized. Accordingly, the CRTC established a policy based on what it called the need to “ensure fair and proportionate use of the service by all end-users”.¹⁶ More importantly, in the Commission’s words:

14. CRTC, Notice of Consultation, CRTC 2011-77, 2011-77-1 and 2011-77-2, “Review of Billing Practices for Wholesale Residential High Speed Access Services” (18 July 2011), online: CRTC <<http://www.crtc.gc.ca>>.

15. CRTC, Order 2000-789, “Terms and Rates Approved for Large Cable Carriers’ Higher Speed Access Service” (21 August 2000), online: CRTC <<http://www.crtc.gc.ca>>.

16. *Ibid* at para 103.

To the extent that these carriers do not apply these volume usage rate restrictions and associated volume thresholds to end-users of their own internet services, the Commission is of the preliminary view that such action would be contrary to s. 27(2) of the [Telecommunications] Act.¹⁷

While cable providers received regulatory support for UBB in 2000, there has since been very limited uptake of TPIA, making it difficult for independent ISPs to adopt the service.¹⁸ The path to UBB for telecom providers offering DSL services, such as Bell, was somewhat different. As the CRTC declined to regulate retail internet services in 1999,¹⁹ Bell was free to implement UBB for its retail customers, which it did in 2006.²⁰

Shifting UBB to wholesale customers presents a different challenge. In order to reach end users, independent ISPs must purchase a regulated service called Gateway Access Service (GAS) from internet carriers. The GAS, much like the TPIA service for cable, is only a connection between end users and the independent ISP. This means that the actual provision of internet services to customers comes from the independent ISP and not from carriers such as Bell. Therefore, it is problematic for Bell to impose data caps on independent ISPs who purchase the GAS. Perhaps even more to the point, there are typically no congestion concerns at the last mile stage that would justify the need for such caps.

17. *Ibid* at paras 103–05. The *Telecommunications Act*, SC 1993, c 38, s 27(2) states “No Canadian carrier shall, in relation to the provision of a telecommunications service or the charging of a rate for it, unjustly discriminate or give an undue or unreasonable preference toward any person, including itself, or subject any person to an undue or unreasonable disadvantage”.

18. Catherine Middleton & Annemijin van Gorp, “How Competitive is the Canadian Residential Broadband Market? A Study of Canadian Internet Service Providers and Their Regulatory Environment” (Paper delivered at the 37th Research Conference on Communication, Information and Internet Policy, 25–27 September 2009), online: Broadband Research at 14–15 <<http://broadbandresearch.ca>>.

19. CRTC, Telecom Order, CRTC 99-592, “Forbearance from Retail Internet Service” (25 June 1999), online: CRTC <www.crtc.gc.ca>.

20. Karl Bode, “‘New’ Sympatico Caps For New Customers Starting December 3” (30 November 2005), online: Broadband DSL Reports <<http://www.dslreports.com>>.

In its 2009 Internet Traffic Management Practice (ITMP) guidelines,²¹ the CRTC supported usage based billing as a sound economic measure to address network congestion. The Commission emphasized its preference for economic measures (such as UBB) over technical measures such as “throttling”, which restrict data transfer rates.²² The Commission decided that traffic management was necessary to address congestion concerns and ensure that all end users receive acceptable internet service. It went on to say:

[E]conomic ITMPs would generally not be considered unjustly discriminatory, as they link rates for Internet service to end-user consumption. Economic ITMPs also provide greater transparency to users than technical ITMPs, as they are reflected in monthly bills. Furthermore, these practices match consumer usage with willingness to pay, thus putting users in control and allowing market forces to work.²³

The CRTC affirmed its preference for economic ITMPs when it established its test for reasonable traffic management practices in 2009. That test requires ISPs to “explain why, in the case of a technical ITMP that results in any degree of discrimination or preference, network investment or economic approaches alone would not reasonably address the need and effectively achieve the same purpose as the [technical] ITMP”.²⁴

(ii) The Carriers on Congestion

Although the CRTC has proceeded on the assumption that UBB is an effective response to network congestion concerns, there is considerable evidence to the contrary. Indeed, both cable and telecom operators have acknowledged in their statements and practices that UBB is at best only loosely related to network congestion. In November

21. The purpose of ITMPs is to manage the internet traffic generated on an ISP's network through economic or technical means.

22. CRTC, Telecom Regulatory Policy, CRTC 2009-657, “Review of the Internet Traffic Management Practices of Internet Service Providers” (21 October 2009), online: CRTC <<http://www.crtc.gc.ca>> [“Review of ITMP”].

23. *Ibid* at para 40.

24. *Ibid* at para 43.

2010, the cable ISP companies—Rogers, Shaw, Videotron, and Cogeco—wrote to the CRTC in support of UBB, and acknowledged that they could not set pricing on the basis of costs:

Any attempt to establish rates for wholesale UBB charges based on a narrow assessment of incremental costs is destined to fail, as it would not take into account the broader behavioral impacts that permit the attainment of the underlying carrier's network management objectives.²⁵

Bell has been even more transparent about the profitability of UBB. In a February 2010 conference call, George Cope, Bell's Chief Executive Officer, noted that it was essential that Bell continue to pursue a usage based model in order to "make sure we monetize this significant opportunity for our investors".²⁶ Mr. Cope later stated that almost all of Bell's revenue growth was coming from usage based billing, particularly because the demand for video streaming had significantly increased internet usage per customer per year.²⁷ In other words, while Bell has claimed that usage based billing only affects a small group of "heavy" users, UBB drives increased revenues from all of its internet access service customers.

Other cable and telecom competitors agree that Bell's original UBB pricing bore little relation to actual costs or network congestion. For example, after reviewing Bell's pricing, Primus described it in these terms: "It's an economic disincentive for internet use. It's not meant to recover costs. In fact these charges that Bell has levied are many, many,

25. Cogeco Cable Inc & Quebecor Media Inc, "RE: Telecom Notice of Consultation CRTC 2010-803, Usage-Based Billing for Gateway Access Services and Third-Party Internet Access Services (TNC 2010-803)—Comments of the Cable Carriers" (29 November 2010), online: CRTC at paras 23–24 <<http://www.crtc.gc.ca>>.

26. Bell Canada Enterprises, "Q4 2009 Results Conference Call and 2010 Guidance Session" (4 February 2010), online: BCE at 9 <<http://www.bce.ca>>. Similarly, in a November 2010 presentation, Shaw Communication executives also told analysts that UBB represents an important monetization opportunity closely linked to customer video usage. See Shaw Communications Inc, "Investor Update" (9 November 2010), online: Shaw Communications at 5 <<http://www.shaw.ca>>.

27. Bell Canada Enterprises, "Q2 2010 Results Conference Call" (5 August 2010), online: BCE at 6 <<http://www.bce.ca>>. See also Bell Canada Enterprises, "Q3 2010 Results Conference Call" (4 November 2010), online: BCE at 3 <<http://www.bce.ca>>.

many times what it costs to actually deliver it”.²⁸ A look at Bell’s internet plans across different provinces suggests that they have nothing to do with pay-what-you-use, but were designed to compete with similar cable ISP data caps. For example, in Quebec, Bell implemented a 60 gigabyte (GB) cap, whereas in Ontario the cap was set at only 25 GB. The difference was plainly a function of the competitive environment in Quebec, where Videotron’s 60 GB cap forced Bell to offer a similar cap.²⁹ Moreover, Bell’s plan featured a 60 GB cap with an overage charge for the next 20 GB, and there was no further cap until the user hit 300 GB.³⁰ In other words, using 80 GB or 300 GB cost the consumer the same thing.

(iii) A Congested Network?

Network congestion refers to the situation where demand on a network exceeds capacity, so the network cannot provide all users with maximum speeds. The CRTC has defined it as “a situation whereby the amount of traffic transiting the network may lead to a deterioration in service for some end users”.³¹ A closer examination of incumbent networks reveals that internet traffic traverses at least three stages from the end user to the internet: the last mile, the ISP’s internal network and the public internet. Typically, congestion concerns arise only at the ISP internal network stage, and not at the others.

The first stage, known as the last mile stage, is the link between the end user and the Central Office (CO). The CO is where ISPs begin to route user traffic to its intended destination. While the last mile is a

28. CBC, “Internet Usage Costs to Rise”, *CBC News* (7 January 2011), online: CBC News <<http://www.cbc.ca>>.

29. CBC, “Internet Download Limit Slashed for Many”, *CBC News* (31 January 2011), online: CBC News <<http://www.cbc.ca>>.

30. CRTC, Telecom Decision, CRTC 2010-255, “Bell Aliant Regional Communications, Limited Partnership and Bell Canada—Applications to Introduce Usage-Based Billing and Other Changes to Gateway Access Services” (6 May 2010), online: CRTC at paras 2, 45, Appendix, Table 1 <<http://www.crtc.gc.ca>>.

31. CRTC, Telecom Public Notice, CRTC 2008-19, “Review of the Internet Traffic Management Practices of Internet Service Providers” (20 November 2008), online: CRTC at n 6 <<http://www.crtc.gc.ca>>.

critical component of the network, congestion at this stage is limited, particularly for DSL services provided by telecom companies, because the ISP can limit the amount of data carried on the last mile by establishing a bandwidth speed consistent with its network capabilities. Moreover, since DSL services directly connect the end user to the CO, there are no other users to congest the network. This has been confirmed by Mirko Bibic, Bell's Chief Regulatory Officer, in these terms: "There is a copper loop that goes from our central office to the home and all data travels on that pipe: internet traffic, television traffic, voice traffic, long-distance traffic. But there are no congestion issues there".³²

The second stage, known as the ISP's internal network stage, runs from the CO until the ISP hands off the user to another provider. This may occur at several different points. In some instances, an independent ISP may co-locate with the incumbent ISP by installing its own equipment at the CO. This means the customer uses the incumbent's last mile but not its internal network. In other instances, the incumbent ISP may aggregate the traffic of many users and deliver the collective traffic to the independent ISP at a later point in the network. Since the ability to deliver faster speeds to users depends in part on shortening the distance between the user and the CO, the investment in the network is focused on a closer connection to the end user. With a close connection to the end user, the traffic is routed along the ISP's internal network until it reaches the third stage—the public internet.

Once the end user traffic reaches the public internet stage, it moves between other network providers to its end destination (for example, a website or an email inbox). This stage involves a global network with no significant congestion concerns (or at least no congestion concerns specific to Canadian ISPs). Independent ISPs are able to acquire sufficient connectivity to handle their customers' traffic demands. This

32. House of Commons, Standing Committee on Industry, Science and Technology, *Evidence* (20 February 2011), online: Parliament of Canada at 1735 <<http://www.parl.gc.ca>>.

traffic transits separately from incumbent ISPs, whose traffic is managed through transit and peering arrangements.³³

The issue of network congestion in Canada is therefore largely limited to the second “ISP internal network” stage. While congestion can arise within this internal network if the simultaneous aggregated traffic demands exceed network capacity, the congested traffic all runs within its own network. The ISP therefore incurs no additional monetary costs. Moreover, there are many ways to manage this congestion. Independent ISPs can hand off their user traffic closer to the CO, so that it does not contribute to the congestion.

Virtually all of the large incumbent ISPs use technical measures known as “traffic shaping” to limit high-bandwidth applications during peak periods. The incumbent ISPs apply these measures to all traffic, whether it is their own retail traffic or traffic originating from independent ISP subscribers.

There is also reason to believe that incumbent ISP networks are large enough to handle the internet traffic without concern for congestion. These networks simultaneously carry other high-bandwidth traffic such as IPTv—internet-based television services—that ISPs offer in competition with cable providers. The issue is one of bandwidth allocation. If internet traffic demands continue to grow faster than the other bandwidth demands running on the same connection, carriers can shift some of the “space” reserved for services such as IPTv to the internet, thereby relieving some of the congestion pressures.

None of this suggests that consumer broadband demand is not growing rapidly. It clearly is, driven by the increased use of the network for streaming and downloading video and data intensive games.³⁴ However, the demands on the network are not beyond historical

33. Transit arrangements are used when two ISPs do not have a direct connection and therefore rely on an intermediary network provider to complete the internet connection. Some ISPs may directly connect with each other and agree to offset each other's traffic (known as a peering arrangement). Yet another alternative for web-based traffic is Content Distribution Networks, which manage and reduce ISP internet traffic.

34. Jennifer Van Grove, “Online Video Continues Steady Growth Streak”, *Mashable Business* (5 February 2011), online: Mashable <<http://mashable.com>> .

norms,³⁵ nor do they necessarily mean that the network is now “congested”. What they do mean is that certain parts of the network may face greater congestion strain during certain periods in the day. This brings no additional cost to ISPs. It can be dealt with in several ways, including more investment, technical measures such as traffic shaping, and a re-examination of bandwidth allocation on ISP networks.

C. The Canadian Internet Access Market: Comparing UBB around the World

Only a decade ago, Canada was seen as a global broadband leader, ranking as high as second in the world on some metrics.³⁶ Today, it is at best a middle of the pack player with mounting frustration among both consumers and businesses that are relying on a world-class digital infrastructure.³⁷ While there is some debate on the reliability and validity of the many studies that have compared wireless and broadband networks around the world, there is no dispute that none ranks Canada as a leader in either area.

The debate over the state of competition of internet access services within Canada has been shaped by the experiences in other countries. Many international studies have concluded that consumers face higher prices and slower speeds in Canada than in other countries.³⁸ For example, basic plans from the South Korean provider, SK Broadband,

35. Peter H Miller, “Developments in Canadian Program Rights Market 2011” (31 March 2011), online: CRTC at para 12 <<http://www.crtc.gc.ca>> (the CRTC found that network demands are growing at roughly 40-50% annually). Compare KG Coffman & Andrew Odlyzko, “Internet Growth: Is There a ‘Moore’s Law’ for Data Traffic?” (15 August 2000), online: SSRN <<http://papers.ssrn.com>> (Coffman and Odlyzko show that historical growth rates have averaged 100% per year).

36. See e.g. Natalie Gagnon & Brian Guthrie, “Cashing in on Canadian Connectedness: The Move to Demonstrating Value” (March 2004), online: The Conference Board of Canada <<http://www.conferenceboardcanada.ca>> where Canada tied Sweden for second place in 2004. The Board’s “Connectedness Index” looks at the availability of information and communications technologies and their price, reach and use.

37. Michael Geist, “OECD Report Finds Canadian Broadband Slow, Expensive” (1 June 2009), online: Michael Geist—Blog <<http://www.michaelgeist.ca>>.

38. *Ibid.*

feature guaranteed download speeds of 100 megabytes (MB) per second, with no data caps and no long-term contracts, for 33 000 won or \$28.62 CAD a month.³⁹ No comparable plan is available from any provider in Canada.

The OECD noted that Canada is one of the few jurisdictions in the world where virtually all providers use some form of UBB.⁴⁰ For most providers, data caps have been in place for years. Rogers established a monthly cap for some of its plans in 2005,⁴¹ and Bell implemented data caps in 2006.⁴² Thus, while much of the focus has been on the widespread use of UBB in Canada, more troubling is its near-uniform implementation. Canadian plans do not distinguish between peak and off-peak use, or between data from different sources, nor do they contemplate other solutions beyond overage charges.

The Canadian internet market is notable for its limited range of options, in comparison to countries with more competition. For example, Germany and the US offer their consumers a choice among unlimited and capped services.⁴³ Other countries have far more variation in their approach to UBB, by imposing restrictions other than overage charges once their consumers exceed the data cap. Australian ISPs, for example, “rate-limit” subscribers who exceed their cap by reducing their download speeds for the rest of the month.⁴⁴ In other words, all plans

39. SK Broadband, “Residential Plans”, online: SK Broadband <<http://www.skbbroadband.com>>.

40. OECD, Directorate for Science, Technology and Industry, “Prevalence of Explicit Bit/Data Caps Among Surveyed Offers, OECD Broadband Statistics” (September 2010), online: OECD <<http://www.oecd.org>>.

41. Karl Bode, “Rogers Applies ‘Generous’ Caps ‘Keeping Pace’ with ‘Evolving Internet Needs’” (15 February 2005), online: DSL Reports <<http://www.dslreports.com/shownews/60361>>.

42. De Ridder, *supra* note 13.

43. Deutsche Telekom, the largest German provider, offers unlimited plans, while providers such as 1und1 offer lower cost plans with a 100 GB data cap. In the US, Comcast offers a 250 GB cap and AT&T recently announced plans to implement a 150 GB cap. Other leading ISPs such as Cablevision and Verizon offer unlimited plans. See Nate Anderson, “Is AT&T’s New 150GB DSL Data Cap Justified?” (14 March 2011), online: Ars Technica <<http://arstechnica.com>>.

44. Simon Hackett, “Fairly Comparing Broadband ADSL Plans in Australia Can Be Difficult” (13 September 2010), online: Internode Blog <<http://www.internode.on.net>>.

are effectively unlimited, but impose different speeds once a certain data threshold is exceeded.⁴⁵ Moreover, in response to competitive pressures, British Telecom recently announced plans to eliminate data caps but retain rate-limiting for heavy internet users.⁴⁶

The Australian market also features another notable variation on UBB. Many ISPs have two separate data caps each month, one for peak time usage and a second for off-peak usage. For example, Optus offers several broadband plans with separate data caps for peak and off-peak usage.⁴⁷ If a subscriber exceeds the peak or off-peak cap, Optus reverts to a rate-limited service.⁴⁸ Other approaches include distinguishing between domestic and international data transfers,⁴⁹ or between upstream and downstream traffic.⁵⁰ These various methods would likely be better than the one-dimensional Canadian approach at reflecting actual costs and addressing congestion concerns.

45. See Appendix. The use of rate-limiting is a relatively common approach in countries with data caps such as New Zealand, Germany and India.

46. See Matthew Lasar, "BT to UK Infinity Subscribers: No More Usage Caps!" (14 March 2011), online: Ars Technica <<http://arstechnica.com>>.

47. The peak period runs from noon to midnight, and the off-peak period runs from midnight to noon.

48. Optus, "Naked Broadband Plans", online: 'yes' Optus <<http://www.optus.com.au>>. See also iiNet, "Broadband Plans", online: iiNet <<http://www.iinet.net.au>> (iiNet offers a similar peak/off-peak data capped service with consumers able to purchase as much as 1 terabyte of data per month).

49. Domestic data transfers may be less expensive because they often remain within a single ISP's network or are subject to an economical peering arrangement. In contrast, international data will typically require a transit arrangement which increases data transfer costs. See e.g. Vodafone, "Ljósleiðari", online: Vodafone <<http://www.vodafone.is>> (Vodafone Iceland offers a 10 GB capped plan but allows for unlimited domestic downloads without any extra costs).

50. Japan uses this variation and limits its data caps to upstream traffic only. It is important to note that the standard upstream caps in Japan are set as high as 900 GB per month, which can hardly be considered a "cap" when compared with Canadian plans. See Chiehyu Li & James Losey, "Bandwidth Caps for Residential High-Speed Internet in the U.S. and Japan" (10 August 2009), online: New America Foundation at 2 <<http://www.newamerica.net>>.

D. UBB's Black Box: How Much Does it Cost to Transport a Gigabyte?

Costs related to internet access pricing structures sit at the centre of the UBB debate, yet the most important data remains shrouded in secrecy. Incumbent ISPs are reluctant to disclose their actual costs in maintaining their networks, arguing that the information is sensitive, confidential commercial data. In recent months, the debate has focused on how much it actually costs to transfer one gigabyte of data, owing to the fact that data caps and overage charges are typically based on gigabytes of data.

Reliable cost information would help clarify at least two issues. First, it would allow the claim that light users are subsidizing heavy users to be tested. Second, it would allow for an accurate analysis of the reasonableness of current overage charges—an analysis which is clearly called for if the provision of internet access is to be analogized to regulated utilities.

(i) Internet Transmission Costs

Calculating the cost for an ISP to transfer one gigabyte of data involves two components—the internet side of the equation and the ISP's internal network costs. As discussed above, user traffic travels through three stages: the last mile, the ISP's internal network and the public internet. The public internet cost is relatively easy to calculate, since all ISPs depend on peering and transit arrangements to carry data between networks. Independent ISPs claim that the cost of a one megabit per second (Mbps) connection is roughly \$5 per month. Given the economies of scale of large ISPs, it is likely that their cost is considerably less. Some estimates put it at \$3 per Mbps per month.⁵¹

With a 1 Mbps connection, an ISP is permitted to transfer 1 megabit (Mb) of data per second on a continuous basis. This is the equivalent of 7.5 megabytes (MB) per minute (60 megabits is equal to 7.5 megabytes), 450 MB per hour, and 10 800 MB per day (or approximately 10.8 GB).

51. William B Norton, "Internet Transit Prices—Historical and Projected" (2010), online: DrPeering International <<http://www.drpeering.net>>.

For a 30 day month, this adds up to 316.4 GB, or roughly 1.58 cents per GB based on a \$5 per month fee. For those larger ISPs able to negotiate lower costs, the \$3 per month fee allows them to transfer a GB of data for under one cent.

While the estimated cost of transit arrangements typically range between \$3 and \$5 per Mbps per month, some estimates suggest that by 2013 it may drop to under \$1 per Mbps per month.⁵² These figures are consistent with other public figures on the cost of large-scale data transfers. For example, the Amazon EC2 service, a leading cloud computing provider, charges one cent per GB for all regional data transfers.⁵³ For data transfers outside a single region, the Amazon EC2 service costs ten cents per GB for all in-bound data transfers in North America and Europe, and as little as eight cents per GB for out-bound data transfers.

(ii) Internal Network Costs

The far more difficult cost calculation involves the internal ISP network, namely the last mile and the internal network. The difficulty comes from the fact that incumbent ISPs zealously guard this information, and any disclosures they make to the CRTC are often redacted on confidentiality grounds.

There is one notable exception, however. Bell disclosed three data sets in 2010, in connection with its proposed broadband expansion to underserved communities. Bell's data describes a "worst case scenario", in the sense that such a network would not be economically viable and would therefore merit additional support through the deferral account process, but the data nevertheless does provide unredacted information. It sets out the total cost of the project over a 15-year period, the number of communities and premises potentially served, the projected revenue, and the peak number of subscribers. Although Bell's preferred option is based on High Speed Packet Access technology, alternatives included a

52. *Ibid.*

53. Amazon, "Amazon EC2 Pricing", online: Amazon Web Services <<http://aws.amazon.com>>.

pure DSL technology option and a hybrid option, which combines both technologies.

The actual cost of building a new network varies considerably between networks, because capital expenditures, network usage, subscribers and properties of the backhaul links all influence actual costs. Nevertheless, a detailed analysis of Bell's data—an analysis which admittedly involves a number of assumptions—suggests that the estimated cost of building a new network would be roughly seven cents per GB.⁵⁴ Although the actual numbers may be higher or lower, the seven cents per GB estimate is fairly consistent in several network models.⁵⁵

When combined with the internet costs of about one cent per GB for larger ISPs, a high-end estimate of the costs for large Canadian ISPs is approximately 8 cents per GB.⁵⁶ This assumes the creation of a new network, and accounts for all stages of the data transfer—including the last mile, the internal ISP network and the public internet transfers—as well as other associated expenditures. While this is higher than the 3 cents per GB figure that has been invoked in some discussions, it is far lower than the overage costs imposed by some Canadian ISPs, which run as high as \$10 per GB.⁵⁷

This calculation of costs prompted a response from Bell in May 2011 after another major Canadian provider, Telus, asked about it during the interrogatory phase of the CRTC hearing on UBB.⁵⁸ Bell argued that the estimate was inaccurate, claiming that it assumed an unrealistically high maximum usage of 900 GB every month, which would result in a lower

54. For a more detailed analysis of the methodology behind these cost calculations, see Michael Geist, "Estimating the Cost to Transfer 1 GB of Data Based on Bell's Network Costs" (2011), online: Michael Geist—Blog <www.michaelgeist.ca>.

55. These models are based on the type of equipment used, including OC3 and OC12.

56. Others have estimated that those ISPs spend 2 to 5 cents per GB. See e.g. Dave Burstein, "Wireline Costs and Caps: A Few Facts" *Fast Net News* (6 March 2011), online: DSL Prime <<http://www.dslprime.com>>.

57. Josh Kerr, "Internet Penalties Challenged", *Yukon News* (4 March 2011), online: Yukon News <<http://www.yukon-news.com>>.

58. Bell Canada, Response to Request, "TELUS-29Apr11-2" (24 May 2011), online: CRTC <http://www.crtc.gc.ca/public/partvii/2011/8661/c12_201102350/1572271.zip>.

cost per GB. Bell noted that average users do not come close to using that maximum capacity, particularly since its network is a shared one. It should, however, be pointed out that the calculation was not at all based on the assumption of maximum usage. Rather, the analysis which underlies it identifies a range of pricing options, based on different equipment configurations and usage patterns, which range from as high as 34 cents per GB to as low as 1.9 cents. The analysis explains that the pricing data was created for rural areas and for a complete build of the network. This suggests that the actual prices per GB will be toward the lower end of the range proposed in the analysis, since the cost for an urban network is likely to be far lower than for a rural network.

Any review of cost estimates in this field makes it apparent that they are subject to many variables, the most important being capacity and usage, and they are therefore likely to fluctuate considerably. For example, over the span of only one week in July 2011, Mirko Bibic, Bell's Chief Regulatory Officer, provided three different cost estimates ranging from 12.4 cents to 19.5 cents per GB.⁵⁹ Arriving at a common metric for identifying per gigabyte pricing will be a crucial aspect to resolving the wholesale UBB issue.

II. What Should Come Next

With both the CRTC and the federal government now seized with the UBB issue, all parties are looking for market-based solutions that will foster competition and fair pricing. A one-size-fits-all approach to UBB will not work. Politicians and regulators would be well advised to identify targeted solutions for wholesale UBB, for retail UBB and for broader concerns about competition in internet access services in Canada.

59. Mark Burgess, "Cost of Transmitting GB of Data Between Eight and One Cent, Advocacy Groups Say", *Hill Times* (13 July 2011), online: The Wire Report <<http://thewirereport.ca>>.

A. Wholesale UBB

The immediate issue before the CRTC is limited to wholesale UBB—the effort by Bell to impose UBB on independent ISPs who pay for the Gateway Access Service. To date, the CRTC has continued to frame the objective as avoiding the “subsidizing” of heavy users.⁶⁰ It should focus instead on fostering a competitive market by establishing rules that allow independent ISPs to compete. In the specific context of wholesale UBB, there are in my view five steps that should be taken toward that end.

First, the CRTC’s decisions to date on wholesale UBB should be rescinded. As discussed above, the early CRTC decisions paved the way for UBB, and now that approach should be undone. The federal government has made it clear that it will accept nothing less, so the Commission appears to have little alternative but to come forward with a different approach. The government has been criticized for meddling in a regulatory issue, but in this instance the CRTC’s approach arguably does need reform.

Second, the CRTC should implement and vigorously enforce its “speed matching” decision,⁶¹ to give independent ISPs more flexibility. Indeed, the CRTC has acknowledged that effective competition requires that independent ISPs be able to offer equivalent speeds to those offered by incumbent providers.⁶² If the speed matching decision is not enforced, independent ISPs cannot compete with incumbents who offer superior speeds.

Third, the CRTC should reverse its decision on Asymmetric Digital Subscriber Line-Central Office (ADSL-CO), a decision that prevented independent ISPs from locating closer to the end user.⁶³ As noted above,

60. CRTC, News Release, “Statement from the Chairman of the CRTC on Usage-Based Billing” (3 February 2011), online: CRTC <<http://www.crtc.gc.ca>>.

61. CRTC, Telecom Notice of Consultation, CRTC 2010-632, “Wholesale High-Speed Access Services Proceeding” (30 August 2010), online: CRTC <<http://www.crtc.gc.ca>>.

62. *Ibid* at 55.

63. ADSL-CO refers to co-location at the central office. The independent ISPs install their own equipment at the central office, allowing the handoff between the last mile connection and the independent ISP to occur much earlier.

policies that encourage independent ISPs to locate closer to end users would have many benefits. More facilities-based competition would allow independent ISPs to offer their customers greater choice, to reduce congestion, and to expand their networks.

Fourth, the CRTC should ensure access to a regulated bulk wholesale service that would allow independent ISPs to allocate data usage as they see fit.⁶⁴ That service would be available for those ISPs that do not use ADSL-CO and cannot afford to invest in co-location facilities. This would provide for the same overall network usage, but without the UBB that limits service differentiation.

Fifth, the CRTC should prioritize making cable Third Party Internet Access (TPIA) service a viable alternative for independent ISPs, particularly with respect to wholesale internet services. While wholesale access is currently available using TPIA, it has taken far too long and has not proven popular. A competitive environment necessitates wholesale access to both cable and DSL. A marketplace that steadily reduces the market share for large DSL providers while leaving cable providers untouched runs the risk of creating de facto cable giants for internet services. Effectively, the DSL side of the market would be splintered among many providers, while the cable share would remain largely untouched.

B. Retail UBB

Given the CRTC's historical hands-off approach to retail internet services, managing retail UBB offers a more complicated regulatory and policy challenge. While some have advocated the elimination of UBB at the retail level, there is little political support for direct intervention by the CRTC in the pricing of retail ISP services. In my view, the best way to improve retail internet services is by promoting a robust competitive environment in which consumers have the option of switching providers if they do not want UBB. In other words, a truly competitive market would have usage based billing as an option, but not the only

64. CRTC, Telecom Regulatory Policy, CRTC 2010-632, "Wholesale High-Speed Access Services Proceeding" (30 August 2010), online: CRTC <<http://www.crtc.gc.ca>>.

option. Letting consumers choose would be the more effective safeguard against unreasonable UBB practices.

In many respects, the current debate resembles the early battle over net neutrality in Canada.⁶⁵ Indeed, if we substitute the terms video streaming, Netflix and heavy users for peer-to-peer, BitTorrent and file sharers, the discussion points are virtually identical. Net neutrality advocates maintained that problems of traffic shaping practices and the preferential treatment of incumbent ISP content were products of an uncompetitive marketplace that required regulatory intervention. In response, incumbent ISPs argued that there was no need for CRTC involvement, and that a market-oriented approach was sufficient to address public concerns.

The CRTC ultimately adopted a set of guidelines designed to ensure that internet traffic management would not be a free-for-all.⁶⁶ These guidelines, known as Internet Traffic Management Practices (ITMPs), mandate full disclosure of traffic management practices, including information on when they occur, which applications they affect, and their impact on internet speeds. Moreover, the CRTC adopted a new test to determine what are reasonable traffic management practices. When consumers complain, ISPs are now required to describe their practices, demonstrate that they are necessary, and establish that they discriminate as little as possible. I suggest that the CRTC should expand on these guidelines in the context of retail UBB and develop what I would call Internet Billing Usage Management Practices or IBUMPs.

65. CBC News, "Battle Over 'Net Neutrality' Arrives in Canada", *CBC News* (2 November 2006), online: CBC News <<http://www.cbc.ca>>. While the definition of net neutrality is open to some debate, it commonly refers to the commitment that ISPs treat all content and applications equally—that is, with no privileges, degradation of service or prioritization based on the content's source, ownership or destination, unless it is beneficial to the customer.

66. "Review of ITMP", *supra* note 22.

(i) IBUMPs—Transparency and Disclosure

The CRTC should adopt requirements similar to those applied to ITMPs to ensure that consumers are better informed about the benefits and limits of their capped services. IBUMPs would include a comprehensive transparency requirement to allow consumers to better understand the limits of their service and reliably track their monthly internet usage. While ISPs already provide some tracking tools, they have proven to be unreliable and prone to errors.⁶⁷ The CRTC's ITMP decision adopts the position that monthly usage bills provide enough transparency to Canadian consumers.⁶⁸ Yet the incumbent ISPs have also sown marketplace confusion through advertising that breeds consumer uncertainty about what their data plans actually provide. For example, marketing materials often overstate the benefits of data plans by referring to unusually small MP3 music or video files, thereby suggesting that consumers can download far more than is likely to be the case.⁶⁹ Similarly, streamed video is often conflated with downloaded video, leaving consumers with the mistaken impression that they can access hundreds of hours of video each month⁷⁰—a claim which may be true for low-definition streaming but not for the downloading of video from commercial services. If UBB is to remain a part of the retail internet access landscape, transparency and public disclosure must improve.

67. See e.g. CBC News, "Bell Admits Internet Metering Problem", *CBC News* (9 February 2011), online: CBC News <<http://www.cbc.ca>>.

68. "Review of ITMP", *supra* note 22.

69. See e.g. Rogers, "Rogers High Speed Internet—See Full Details" (2011), online: Rogers.com <<http://www.rogers.com>> (Rogers currently warns consumers that estimates on video and song downloads are subject to the following disclaimer: "The times specified are approximations and will vary depending on size and quality of content". Rogers does not provide specific information on the basis of the advertised claims).

70. Mirko Bibic, "Pay for Usage", *Financial Post* (3 February 2011), online: Financial Post <<http://www.financialpost.com>>.

(ii) IBUMPs—Reasonableness

Addressing retail internet service concerns will require more than simply improving transparency and disclosure guidelines. What is needed is an effective IBUMPs policy that would guarantee that UBB practices were reasonable in light of realistic network congestion concerns and marketplace conditions. Although the CRTC's current test for acceptable ITMPs contains a reasonableness requirement, it applies only in circumstances of discrimination or improper preference. Since usage based billing does not typically raise such issues, UBB plans are not often subject to that requirement. The IBUMP policy suggested in this paper would address that gap by imposing four conditions on all retail UBB practices.

First, ISPs should have to demonstrate that their retail UBB practices are in fact designed to address specific network congestion concerns. This is consistent with the rationale for the CRTC's approval of UBB, which focuses on addressing network congestion. Indeed, incumbent ISPs themselves claim that the objective of UBB is to deal with congestion concerns and maintain fairness among all subscribers.

Second, if it is to achieve its goals, the UBB model should be as unrestrictive as possible. Much as with ITMPs, consumers should have the option to choose rate-limited accounts instead of mandatory overage charges—an approach which, as noted above, has been adopted by many leading ISPs around the world.

Third, if an ISP has implemented other technical measures such as traffic shaping or throttling, it should be required to demonstrate why those approaches have not adequately addressed network congestion concerns. This would be a mirror image of the ITMP requirement that envisions ISPs relying on network investment or economic ITMPs, such as UBB, rather than on technical ITMPs.

Fourth, if an ISP has implemented economic measures, the CRTC should, in certain circumstances, examine overage charges. This would only be necessary in local markets where both the cable and DSL providers used UBB and thus left consumers with few alternatives. Although the CTRC should not review retail pricing or the size of monthly data caps, it should review overage charges to preclude price gouging while still allowing ISPs to make a reasonable profit.

Given the shortcomings in the Commission's ITMP decision, the IBUMP approach suggested above would provide much needed guidance. The ITMP decision recognized that reasonable traffic management practice guidelines could co-exist with a largely unregulated retail internet services market. Because that decision focused too heavily on technical measures, it left economic ITMPs largely unregulated, effectively giving the CRTC's blessing to the implementation of UBB. Given recent marketplace developments, it is increasingly clear that that was a mistake. Although the Commission should not dictate pricing models, it should ensure that pricing models are transparent and that those premised on addressing network congestion do so in the least restrictive manner possible.

C. Fostering Greater Competition

In recent months, there has been considerable public discussion about the benefits of relaxing telecom foreign ownership restrictions in order to increase competition.⁷¹ The days of retaining Canadian control over physical telecommunications infrastructure are over. Even though many Canadian carriers regularly outsource customer service jobs, other positions, such as sales or network building, will remain in Canada regardless of the carrier's country of origin. While some head office positions would be at risk, new companies operating in Canada could well create more jobs overall.

Beyond the jobs issue, concerns that foreign competitors will not abide by Canadian law are unfounded. A great many foreign companies operate in many fields in Canada, and they comply with our laws as a cost of doing business. There is no reason to believe that a local telecom company is any more likely to comply with Canadian law than a foreign one.

Although foreign ownership restrictions should end, there are several reasons why allowing foreign competition will not by itself resolve the

71. Bea Vongdouangchanh, "Clement Top Priority: Making \$40-Billion Telecommunications Industry More Competitive", Hill Times (14 March 2011), online: Hill Times at 1-3 <<http://www.hilltimes.com>>.

problems with Canadian broadband. First, the last mile will remain a major problem. There may be some willingness on the part of new entrants to lay their own fibre connections in urban areas, but it is unlikely to extend much beyond that. Second, some deep-pocketed foreign competitors may simply buy Canadian companies rather than invest in new facilities. Third, foreign ownership is likely to have its greatest impact in the wireless broadband context. This would divert foreign investment away from fibre networks and new facilities. The forthcoming spectrum auction⁷² provides the best hope for new competitors and consumers to “cut the cord” and opt for “anywhere” connectivity that offers reasonable (though not fibre-like) speeds.

At the federal level, current Canadian broadband programs should be expanded to address both access concerns and competition concerns. To date, those programs have focused primarily on providing access to communities that still do not have broadband connections. Although it is essential that all Canadians have access to broadband networks, it is equally important for the federal government to encourage new business models. In particular, community-based fibre initiatives hold the promise of new local competition. Providing federal support for innovative approaches might help new ventures by lessening the risk associated with establishing new facilities. However, in exchange for financial support, the federal government should mandate that new fibre networks be open to all competitors.

In addition, the federal government should ask to collaborate with CANARIE, Canada’s Advanced Research and Innovation Network.⁷³ CANARIE is a world-class fibre-optic network with 19 000 kilometres of coverage throughout Canada. It connects researchers and innovators across the country and around the world by providing unlimited bandwidth for the purposes of research and innovation. The

72. Industry Canada, News Release, “Minister Clement Updates Canadians on Canada’s Digital Economy Strategy” (22 November 2010), online: Industry Canada <<http://www.ic.gc.ca>>. The government policies for that auction (which include open access requirements, set-asides for new competitors, foreign bidders and white spaces) are absolutely crucial.

73. See generally “Canada’s Advanced Research and Innovation Network” (2010), online: CANARIE <<http://www.canarie.ca>>.

government should identify local community networks that would benefit from connecting to CANARIE's broadband backbone, and should rally support for its experimental broadband networks. The US has embarked on a similar initiative, allocating \$60 million in stimulus funds to the United States Unified Community Anchor Network, a national project that extends advanced broadband capabilities to community anchor institutions, such as public libraries, schools and parks.⁷⁴

The federal government can also promote new community fibre network initiatives led by provincial and municipal governments. Some of the most competitive internet access environments in the world are in cities that seized the issue and developed a strategy for promoting high-speed open access networks. For example, the city of Stockholm founded the "Stokab system" in 1994, after the Swedish government passed a law that sought to develop a "sustainable information society for all".⁷⁵ Today, the Stokab network has thousands of kilometres of open access cable that supports operators and service providers, along with hundreds of additional customers. Stockholm has been working with building developers to enable tenants in new buildings to choose from several different providers. Recently, the city announced plans to provide fibre connections to 90% of all households by 2012.⁷⁶

While it will realistically take several years for new competitors to penetrate the Canadian market, it is absolutely essential to foster more competition. In the meantime, the Competition Bureau must prevent ISPs from abusing UBB through anti-competitive practices—for example, by favouring their own content and services over internet-based alternatives. The Bureau should aggressively investigate abusive behaviour, as well as questionable marketing tactics, and should take appropriate measures against them.

74. United States Unified Community Anchor Network, online: US UCAN <<http://www.usucan.org>>.

75. Näringsdepartementet, "Proposition 2004/05:175 Från IT-politik för samhället till politik för IT-samhället" (7 July 2005), online: Regeringskansliet at 1 <<http://www.regeringen.se>>.

76. "A Look at Digital Cities" International Telecommunication Union (May 2010), online: ITU News <<http://www.itu.int>>.

Conclusion

The lack of competition in Canadian internet access is the product of ten years of policy neglect. While it may be true that there are hundreds of independent ISPs, the reality is that most Canadian consumers see little alternative to a single DSL provider and a single cable provider. Moreover, there is little product differentiation between the two dominant providers (Bell and Rogers), which have similar pricing, data plans and data caps.

The widespread use of data caps in Canada is a function of a highly concentrated market. A handful of ISPs control so much of the market that they can impose highly unpopular measures without much fear of losing customers. Addressing public concerns and policy concerns with ubiquitous UBB plans requires more than just a quick regulatory fix. It demands a broader public strategy designed to foster a more robust competitive environment for internet access services in Canada.

Appendix

Comparative Global Internet Access Services, March 2010

Market	ISP	Offers unlimited data plans?	Details if cap:
Australia	BigPond (Telstra)	No ⁷⁷	No additional usage charges. All plans include rate-limiting that slows speeds once usage allowance is reached. No peak or off-peak restrictions. Offers BigPond Unmetered which provides entertainment content that does not count toward monthly usage limit.
Australia	Optus	No ⁷⁸	No additional usage charges. All plans include rate-limiting that slows speeds once usage allowance is reached. Plans include peak and off-peak caps.
Australia	iiNet	No ⁷⁹	No additional usage charges. All plans include rate-limiting that slows speeds once usage allowance is reached. Plans include peak and off-peak caps.
Chile	VTR	Yes ⁸⁰	n/a
Chile	Movistar	Yes ⁸¹	n/a
France	Orange	Yes ⁸²	n/a

77. BigPond, "Plans", online: BigPond <<http://go.bigpond.com>> .

78. Optus, *supra* note 48.

79. iiNet, *supra* note 48.

80. VTR, "Banda Ancha Productos y Servicios", online: VTR <<http://vtr.com>> .

81. Movistar, "Banda Ancha Hogar", online: Movistar <<http://www.movistar.cl>> .

82. Orange, "Découverte", online: Orange <<http://abonnez-vous.orange.fr>> .

France	Free	Yes ⁸³	n/a
France	Teleconnect	Yes ⁸⁴	n/a
Germany	T-Home (Deutsche Telekom)	Yes ⁸⁵	n/a
Germany	1und1	Yes (both limited and unlimited plans available) ⁸⁶	Rate-limited: after exceeding the data cap on the limited plans, download speed reduces from 16 000 kbps to 1 000 kbps.
Germany	Kabeldeutschland	Yes ⁸⁷	n/a
Hong Kong	Hong Kong Broadband Network	Yes ⁸⁸	n/a
Iceland	Siminn	No ⁸⁹	Users are notified by SMS or email when they exhaust their cap. Extra bandwidth is available for 1 600 kr for 10 GB or 5 040 kr for 50 GB.
Iceland	Vodafone	No ⁹⁰	Only data that originates from outside Iceland counts against the cap. All data downloaded domestically is unlimited

83. Free, "Brochure Tarifaire", online: Free <<https://adsl.free.fr>>.

84. Teleconnect, "Anglopack", online: Teleconnect <<http://www.teleconnect.fr>>.

85. T-Home (Deutsche Telekom), "Call & Surf Basic mit Internet-Flatrate", online: T-Home <<http://www.telekom.de>>.

86. 1und1, "1&1 DSL Tarifvergleich", online: 1&1 DSL <<http://dsl.1und1.de>>.

87. Kabel Deutschland, "Preisliste und Leistungsbeschreibung", online: Kabel Deutschland <<http://www.kabeldeutschland.de>>.

88. Hong Kong Broadband Network, online: City Telecom (HK) Ltd <<http://apply.hkbn.net>>.

89. Siminn, "Internetáskrift", online: Siminn <<http://www.siminn.is>>.

90. Vodafone (Iceland), "ADSL—Réttu nettengingun fyrir þig", online: Vodafone <<http://www.vodafone.is>>.

			without any extra cost. Users are notified as they approach the download limit. When the limit is reached, Vodafone “cap[s] the usage” so the customer is not billed. The user can also purchase 5 GB extra for 990 kr [\$5.33 CAD].
India	Bharat Sanchar Nigam Limited	Yes (both limited and unlimited plans are available) ⁹¹	BSNL offers a wide variety of plans, both with and without data limits. Limited plans are available that are either rate-limited (that is, download speed slows after exceeding the cap) or that incur per MB charges for exceeding the cap.
Japan	NTT	No ⁹²	900 GB cap on upload only.
Japan	KCN	Yes ⁹³	n/a
Malaysia	TM Streamyx	Yes (though with an ambiguous Fair Use Policy) ⁹⁴	n/a
Malaysia	PersiaSys	Yes ⁹⁵	n/a
Malaysia	Maxis	Yes (both limited and unlimited plans available) ⁹⁶	For the limited plans, exceeding the allowed bandwidth incurs a charge of 5 sen per MB.

91. Bharat Sanchar Nigam Ltd, “BB Best Plan Selector”, online: Bharat Sanchar Nigam Ltd <<http://210.212.169.201/erp/bbplan.php?action=N>>.

92. Li & Losey, *supra* note 50 at 3.

93. *Ibid.*

94. TM Streamyx, “Broadband Standard Packages”, online: TM <<http://www.tm.com.my>>. See also TM Streamyx, “Fair Usage Policy”, online: TM <<http://www.tm.com.my>> (TM’s Fair Usage Policy states: “The Fair Usage Policy automatically identifies the extremely heavy users and manages their bandwidth in order to protect the service of all our other customers”).

95. Persiasys, “Home Packages”, online: Persiasys <<http://www.persiasys.com>>.

96. Maxis, “Broadband”, online: Maxis <<http://www.maxis.com.my/main.asp>>.

Mexico	Telmex	Yes (both limited and unlimited plans are available) ⁹⁷	Some plans are advertised as having data caps. However, even the unlimited data plan appears to be covered by the following Fair Use Policy: "Furthermore, in order to protect the quality of the Service, you acknowledge and agree that it may: (i) terminate any SESSION INTERNET when failure to detect the use thereof by the CUSTOMER, (ii) limit the volume of data transferred and (iii) limit time periods, according to the modality of the service". ⁹⁸
Mexico	Telecable	Unknown—Telecable does not advertise its data usage policy ⁹⁹	n/a
New Zealand	Actrix	No ¹⁰⁰	When the bandwidth cap is exceeded, the customer has a choice: "rate-limited", in which there is no extra charge, but the speed is reduced to that of dial-up; or the user can pay \$2 (NZD) per gigabyte.
New Zealand	Telecom	No ¹⁰¹	When the bandwidth cap is exceeded, the customer has a choice: "rate-limited", in which there is no extra charge, but the speed is reduced to that of

97. Telemex, "Terminos y Condiciones", online: Telemex <http://www.telmex.com/mx/hogar/pdf/pt_descarga.jsp?a=Terminosycondiciones-Infinitum.pdf>.

98. *Ibid* at 6.

99. Telecable, online: Telecable <<http://www.telecable.net.mx>>.

100. Actrix, "Cyber Jet Broadband", online: Actrix <<http://www.actrix.co.nz>>.

101. Telecom NZ, "Plans and Pricing", online: Telecom NZ <<http://www.telecom.co.nz>>.

			dial-up; or the user can pay \$2 (NZD) per gigabyte.
Nigeria	JuniSat	Yes (both limited and unlimited plans are available) ¹⁰²	Only incoming traffic counts against the cap for the limited plans. Consequences of exceeding the limit are unclear.
Nigeria	CobraNet	No ¹⁰³	Cobranet uses McWiLL wireless technology. Most plans have data limits, however, some have unlimited data but limited time.
Philippines	PLDT	Yes ¹⁰⁴	n/a
Philippines	Digitel	Yes ¹⁰⁵	n/a
Russia	Koptevo.net	Yes (both limited and unlimited plans are available) ¹⁰⁶	For the limited plans, users are charged a fee for each MB of excess usage.
Russia	ЦентроСеть (CentroSet)	Yes (both limited and unlimited plans are available) ¹⁰⁷	For the limited plans, users are charged a fee for each MB of excess usage.
Singapore	SingNet	Yes ¹⁰⁸	n/a
South Korea	SK Broadband	Yes ¹⁰⁹	n/a
United Kingdom	BT	Yes (both limited and	Users receive a usage notice after reaching 80% of their cap.

102. Junisat, "Hughes HX50 Broadband", online: Junisat <<http://www.junisat.com>>.

103. Cobranet, "Home/Office", online: Cobranet <<http://www.cobranet.org>>.

104. PLDT myDSL, "Bundled Plans", online: PLDT myDSL <<http://myworldmysdl.com>>.

105. Digitel, "Digitel DSL", online: Digitel <<http://lec.digitel.ph>>.

106. KoptevoNet, "Services and Prices", online: KoptevoNet <<http://www.koptevo.net>>.

107. CentroSet, "Internet", online: CentroSet <<http://centroset.ru>>.

108. Singnet, "Why Singnet Broadband?", online: Singnet <<http://www.singnet.com.sg>>.

109. SK Broadband, *supra* note 39.

		unlimited plans available) ¹¹⁰	There are no penalties for subscribers who exceed the cap during the first month; however, there is a £5 per 5GB overage charge imposed on the second month.
United Kingdom	Virgin Media	Yes ¹¹¹	n/a
United Kingdom	CCS Leeds	No ¹¹²	Data cap applies only to “peak” period usage. The peak period is generally 8:00 am to midnight on weekdays. Users may choose between “top-up” packages or paying per GB. Top-up packages are: 10GB for £10.38, 25GB for £24.98, 50GB for £49.00, 75GB for £73.00 and 100GB for £95.95. Without a top-up the price is £1.31 per GB.
United Kingdom	Breathe	Yes ¹¹³	n/a
United States	Comcast	No ¹¹⁴	250 GB data cap.
United States	Verizon	Yes ¹¹⁵	n/a

110. BT At Home, “Broadband”, online: BT <<http://www.productsandservices.bt.com>>.

111. Virgin, “Compare our broadband packages”, online: Virgin Media <<http://shop.virginmedia.com>>.

112. CCS Leeds, “Residential Broadband”, online: CCS Leeds <<http://www.ccsleeds.co.uk>>.

113. Breathe, “Broadband”, online: Breathe <<http://www.breathe.com>>.

114. Li & Losey, *supra* note 50 at 2.

115. *Ibid.*

Country	Are unlimited plans available at all?
Australia	No
Chile	Yes
France	Yes
Germany	Yes
Hong Kong	Yes
Iceland	No
India	Yes
Japan	Yes
Malaysia	Yes (although with ambiguous Fair Use Policy)
Mexico	Yes (although with ambiguous Fair Use Policy)
New Zealand	No
Nigeria	No
Philippines	Yes
Russia	Yes
Singapore	Yes
South Korea	Yes
United Kingdom	Yes
United States	Yes