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Telecom Notice of Consultation CRTC 2011-77

Review of Billing Practices for Wholesale Residential High-Speed Access Services

CRTC Reference No.: 8661-C12-201102350

Initial Comments of OpenMedia.ca

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INTRODUCTION

1. The Sameulson-Glushko Canadian Internet Policy & Public Interest Clinic (CIPPIC) on behalf of the OpenMedia Engagement Network (OpenMedia.ca) offers its initial comments with respect to Telecom Notice of Consultation CRTC 2011-77, issued February 8, 2011.
2. As in Telecom Public Notice CRTC 2008-19, this proceeding puts directly at issue the appropriate balance that the Commission must strike between “the freedom of Canadians to use the Internet for various purposes with the legitimate interests of ISPs to manage the traffic thus generated on their networks” while preserving the “rapid and uncontrolled innovation” that has characterized the development of the Internet to date.¹ Andrew Odlyzko characterizes this struggle as such:

The fundamental issue is the degree to which service or goods providers are allowed to discriminate among their customers. Basic economic theory tells us, and empirical evidence reaffirms, that more control allows providers to increase revenues and profits. Both theory and evidence also show that under some conditions, this is to the benefit of customers. The real question is about the appropriate balance, and this question has been debated, explicitly or implicitly, over centuries...Traditionally, law has imposed special non-discrimination and duty to serve obligations on those employed in certain industries. The understanding was that untrammelled control for providers in such industries, in particular transportation, inn-keeping, and communication, was similar to a lack not just of property rights but of law itself. It would expose society to arbitrary actions that repressed economic activity, either by making enterprises unprofitable, or introducing prohibitive degrees of uncertainty.²

As with TPN 2008-19, the deep and enduring public interest and concern in this issue is evident in OpenMedia.ca’s online petition signed by over 475,000 Canadians

¹ Telecom Regulatory Policy CRTC 2009-657, *Review of the Internet Traffic Management Practices of Internet Service Providers*, October 21, 2009, CRTC Reference No.: 8646-C12-200815400, <<http://www.crtc.gc.ca/eng/archive/2009/2009-657.htm>>, paras. 4, 7, and 9. See also Telecom Public Notice CRTC 2008-19, *Review of the Internet Traffic Management Practices of Internet Service Providers*, November 20, 2008, <<http://www.crtc.gc.ca/eng/archive/2008/pt2008-19.htm>>.

² A. Odlyzko, “Neutrality, and Non-Neutrality, From the Past to the Future”, 2011, <<http://www.dtc.umn.edu/~odlyzko/doc/neutrality.past.future.txt>>.

as well as in the almost 90,000 comments from Canadians that have already been directed to the Commission with respect to this proceeding.³

3. TNC 2011-77 addresses one narrow aspect of the balance equation referred to above – the operation of bandwidth thresholds or caps within the wholesale context. The Notice of Consultation along with Telecom Decisions CRTC 2010-255, 2010-802, and 2011-44 demonstrate the Commission’s attempts to address the issue of network congestion/provisioning costs in a fair and equitable manner and the challenges associated with doing so.
4. These challenges, in OpenMedia.ca’s view, are driven by a misunderstanding of the technical underpinning of many of the claims put forth in the record of this manner. As noted by MTS Allstream, the UBB proceedings have been characterized by a lack of “agreement or understanding of the facts” coupled with a “proliferation of misinformation”.⁴, as well as by the nature of economic ITMPs, which are characterized as congestion-management techniques but often operate as simple pricing mechanisms. While the concept of economic measures is not inherently offensive and is even compelling in some contexts, it raises distinct issues when applied to the Internet context and current incumbent practices are having a detrimental impact on innovation and user Internet experience.
5. In Telecom Regulatory Policy CRTC 2009-657, the Commission recognized the need for mechanisms to prevent ISP congestion management mechanisms from operating in a manner that conflicts with the policy objectives by hurting online innovation and degrading Canadians’ use of the Internet. TRP CRTC 2009-657 was intended to ensure provisioning as the primary response to traffic growth/congestion on a network. It recognized, however, that:

³ See <www.openmedia.ca/meter> and <www.openmedia.ca/crtc>, last accessed March 26, 2011.

⁴ MTS Allstream, “Telecom Notice of Consultation CRTC 2011-77, *Review of billing practices for wholesale residential high-speed access services*, File number: 8661-C12-201102350, Re: Request for Broadening of Proceeding and Change to Procedure”, February 22, 2011.

investment alone does not obviate the need for certain ITMPs, which may be used to address temporary network capacity constraints and changing network conditions, as well as service innovations.⁵

6. TRP 2009-657 required ISPs wishing to depart from investment as a means of addressing network congestion by imposing an ITMP to justify any discriminatory impact such an ITMP might have. It further held that ITMPs are less likely to be justified where they impact detrimentally on specific applications or protocols.⁶ TRP 2009-657 additionally noted that economic ITMPs are more likely justifiable, as they are more transparent and attempt to facilitate customer choice by tying usage to willingness to pay.⁷
7. Since the time of TPN CRTC 2008-19, trends in incumbent use of economic ITMPs have shifted dramatically so as to warrant examination of their efficacy and role as a congestion-management technique in more detail. Any ITMP, whether economic or technical, should only be used in exceptional circumstances – situations where normal network investment cannot address congestion. It is important, then, to examine the economic ITMP ecosystem as it is currently operating in Canada, in general, before turning to the question of how to address that situation.
8. While this proceeding is limited in focus to examining economic ITMPs within the context of wholesale alone, it is first necessary to examine the desirability of a national Internet landscape that is saturated with monthly caps.⁸ In OpenMedia.ca's

⁵ TRP CRTC 2009-657, *supra* note 1, paras. 35-36. CIPPIC notes, however, that 'service innovations' have little to do with congestion management and, regardless, must be the subject of competition and differentiation.

⁶ TRP CRTC 2009-657, *supra* note 1, para. 40.

⁷ TRP CRTC 2009-657, *supra* note 1, para. 40.

⁸ The Commission noted in its "Letter to Interested Parties, Re: *Review of billing practices for wholesale residential high-speed access services*, Telecom Notice of Consultation CRTC 2011-77, 8 February 2011 – Requests to modify the scope and terms of the proceeding," March 11, 2011, <<http://www.crtc.gc.ca/eng/archive/2011/lt110311.htm>>:

The Commission considers that the two principles stated above and in Notice 2011-77 are intended to create a fair wholesale regime that (1) protects the interests of consumers and Small ISPs, and (2) does not create an unintended advantage for any particular service provider or user. In addition, the principles stated above do not prejudice in any way the outcome of this proceeding. In reviewing the

view, this first step is vital, in that the benefit of preserving the ability of smaller ISPs to compete on economic ITMPs can only be fully assessed in light of this objective and by this metric. OpenMedia.ca concludes that a national landscape devoid of unlimited Internet usage options is neither optimally efficient, nor desirable. As such, the Commission should use any regulatory tool at its disposal, including the tariffs at issue in this proceeding, to reduce the currently unchecked ability of incumbents to set monthly caps at will. However, OpenMedia.ca cautions that, given the miniscule market share currently captured by wholesale providers, such measures are necessary but not likely to be sufficient.

I. RUNAWAY CAPS: WELCOME DISCRIMINATION?

9. Economic ITMPs as currently deployed in the Canadian marketplace are problematic and aim to become more so if left unchecked. Such ITMPs, while billed as ‘congestion-management’, are not narrowly tailored to address unmanageable congestion and instead are operating so as to deter legitimate Internet use and impose costs on Internet users in a manner that is both unfair and undesirable. This is demonstrated most clearly by examining the relationship between traffic growth, congestion, and monthly caps on a macro level.

billing practices for mandated wholesale residential high-speed access services in this proceeding, the Commission is inviting comments on proposals for billing practices that implement these two principles, and is not limited to examining only usage-based billing (UBB).

For example, the scope of the proceeding does not preclude proposals for billing practices that incorporate usage-based charges aggregated on a per-ISP basis or that are driven by peak period traffic, as indicated by some parties in their comments. The scope of the proceeding also does not preclude comments on the effectiveness of any billing practice as an Internet traffic management practice.

A. BIT CAPS AND THE CANADIAN WIRELINE LANDSCAPE

IP Traffic Growth Rates at Historical Low

10. Many point to the proliferation of high bandwidth applications as indicative of an era of phenomenal wireline traffic growth and subsequently as justification for ITMPs.⁹ In justifying the “need for a new price structure” in its GAS tariff, Bell noted that the status quo flat-rate pricing structures “were not designed to handle this dramatic increase in demand”, citing data in its submissions to TPN 2008-19 in support:

For example, Cisco predicts that from 2007-2012 Internet traffic will grow six fold worldwide and even the more conservative Minnesota Internet Traffic Studies (MINTS), headed by professor Andrew Odlyzko, estimates that while Internet traffic is expected to grow by fifty percent a year, four to six times annual growth is still possible since there are potential sources that can drive this growth such as data transfer and video transmission.¹⁰

It is important, as a starting point, to note that while wireline traffic is growing at a steady rate, we are, in fact, currently in an era characterized by dramatically *reduced* rates of annual growth.¹¹

11. Wireline Internet traffic in Canada experienced a steady 43% annual rate of growth over the 2005 to 2008 period.¹² This is consistent with global and North American

⁹ See TRP CRTC 2009-657, *supra* note 1, para. 5: “In response to the impact of this growth on their networks, some ISPs have implemented Internet traffic management practices...” See also: Bell, “Network Management”, Bell Sympatico Internet – Troubleshooting, <http://service.sympatico.ca/index.cfm?method=content.view&content_id=12119>, (last accessed March 27, 2011):

There continues to be phenomenal growth of consumer Internet traffic throughout the world. Bell, similar to other providers here in Canada, may be required to manage its network in such a way that no customer, service or application consumes excessive bandwidth which may impede the use and enjoyment of other customers.

¹⁰ Bell, “Associated with Bell Aliant Tariff Notice 242 and Bell Canada Tariff Notice 7181”, March 13, 2009, Abridged, <<http://www.crtc.gc.ca/public/8740/2009/b2/1043233.zip>>, [“Bell, Initial Tariff Justification”], para. 9.

¹¹ Minnesota Internet Traffic Studies (MINTS), “Internet Growth Trends & Moore’s Law”, <<http://www.dtc.umn.edu/mints/igrowth.html>>, last accessed March 27, 2011.

¹² TRP CRTC 2009-657, *supra* note 1, para. 5.

figures, which set the annual rate of growth at approximately 40-50% in 2009.¹³ This is down from recent years and,¹⁴ indeed, since the record of TPN 2008-19, CISCO's updated Visual Networking Index revises its annual growth projections, cited above as 46% CAGR for 2007-2012,¹⁵ to a more conservative 34% CAGR from 2009-2014.¹⁶

12. That wireline Internet growth is currently experiencing a downward trend is important to keep in mind, but more salient, perhaps, is how these rates of annual growth factor in the historical context. In this regard, it should be noted that 43% is significantly lower than the 100% annual growth rate that has characterized the Internet's historical development.¹⁷
13. ISPs have been successfully managing far higher rates of growth than this without ITMPs and there is little justification for deviating from investment as a management strategy. Meeting this traffic growth should cost no more than it ever

¹³ Minnesota Internet Traffic Studies (MINTS), "MINTS pages updated, many new reports, further slight slowdown in wireline traffic growth rate", http://www.dtc.umn.edu/mints/news/news_22.html report a 40-50% annual rate of growth for 2009 year end in the United States as well as in the World at large. CISCO likewise notes that Global IP traffic grew at a rate of 45%: CISCO, "Visual Networking Index: Forecast and Methodology, 2009-2014", June 2, 2010, <http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf>, [CISCO VNI 2010].

¹⁴ CISCO VNI 2010 records 45% annual growth for 2009, down from 55% in 2007 and from a projected 63% in 2008: CISCO, "Visual Networking Index - Forecast and Methodology, 2007-2012", June 16, 2008, <http://newsroom.cisco.com/dlls/2008/ekits/Cisco_Visual_Networking_Index_061608.pdf>, [CISCO VNI 2008], p. 1,

¹⁵ CISCO, "Visual Networking Index - Forecast and Methodology, 2007-2012", June 16, 2008, <http://newsroom.cisco.com/dlls/2008/ekits/Cisco_Visual_Networking_Index_061608.pdf>, p. 1, projected that wireline traffic would grow at a compound annual growth rate of 46% (or 4-6 times, net) from 2007-2012.

¹⁶ CISCO, "Visual Networking Index: Forecast and Methodology, 2009-2014", June 2, 2010, <http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf>.

¹⁷ K.G. Coffman & A. Odlyzko, "Internet Growth: Is there a 'Moore's Law' for data traffic?", July 11, 2000, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=236108> demonstrate how an annual 100% rate of growth can be traced back through most of the then 30 year old history of the Internet and its predecessors, although they note that pre-Internet networks would have experienced broader standard deviations from this annual average. They additionally note one brief post-Internet growth spurt in 1995-1996 that exceeded this otherwise standard 100% annual growth rate. See also: Minnesota Internet Traffic Studies (MINTS), "Internet Growth Trends & Moore's Law", <<http://www.dtc.umn.edu/mints/igrowth.html>>, last accessed March 27, 2011.

has. In fact, as it is certainly a truism that “while demand is increasing the cost for capacity is actually decreasing”,¹⁸

Investment Remains Steady, Revenues Grow

14. Incumbent capital investment in wireline has remained steady over the last four years (about 1.6% CAGR 2006-2009).¹⁹ Meanwhile, over the same period, incumbent telecom high speed wireline revenues continued to grow at a steady rate of about 10% CAGR.²⁰ More recent reports suggest that wireline revenues are higher. Professor Geist cites annual reports from Bell mentioning wireline quarterly revenue growth rates ranging from 3.8% [over 15% annual] to 5% [nearing 20% annual], largely driven by usage based revenues, which increased 83% year over year in Q3 2010.²¹

Usage Increases While Caps Plummet

15. As noted above, Internet traffic is growing at a steady but manageable annual rate of about 45%. One would expect monthly caps would track this growth rate. They have not. Monthly caps for broadband wireline services *fell* 19% from 2008-2009 in Canada.²²

¹⁸ MTS Allstream, “Telecom Notice of Consultation CRTC 2011-77, *Review of billing practices for wholesale residential high-speed access services*, File number: 8661-C12-201102350, Re: Request for Broadening of Proceeding and Change to Procedure”, February 22, 2011.

¹⁹ CRTC Communications Monitoring Report, 2010, Table 5.1.9, <<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr51.htm#t519>>.

Net incumbent wireline capital investments were \$4 billion in 2006, \$4.2 billion in 2007, \$4.1 billion in 2008, and \$4.2 billion in 2009 – a CAGR of about 1.6% from 2006 to 2009.

²⁰ CRTC Communications Monitoring Report, 2010, Table 5.3.1, <<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr51.htm#t531>>, Data set: 2006: 1,160; 2007: 1,331; 2008:1,406; 2009: 1,506. This figure is likely a low estimate as it includes 2008 which saw global economic collapse and falling revenues across several sectors. When Cable BDU high-speed revenues are added to the calculation, the figure becomes 12% CAGR. Cable data set: 2006:2,809; 2007:3,266; 2008:3,535; 2009:3,925. Combined incumbent high speed revenues: 2006:3,969; 2007:4,597; 2008:4,941; 2009:5,523.

²¹ M. Geist, “BCE CEO Cope Says UBB Accounts for Almost All Internet Revenue Gains”, March 21, 2011, <<http://www.michaelgeist.ca/content/view/5697/125/>>

²² CRTC Communications Monitoring Report, 2010, Table 5.3.3, Part 2 of 2, <<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr51.htm#t533>>. I exclude the over

| Downstream Speed (Avg Upstream) | 2008 Cap GB/Month | 2009 Growth (2008 Cap+45%) | Actual 2009 Cap | Shortfall (Growth - Actual) |
|---------------------------------|-------------------|----------------------------|-----------------|-----------------------------|
| 1.5 - 4 Mbps (809 Mbps) | 43.25 | 62.71 | 32.20 | 48.7% |
| 5 - 9 Mbps (744 Mbps) | 54.18 | 78.56 | 42.80 | 45.5% |
| 10 - 15 Mbps (862 Mbps) | 80.81 | 117.17 | 69.53 | 40.1% |
| Total Broadband: | 178.24 | 258.44 | 144.53 | 44.0% |

Table 1: Falling Monthly Caps²³

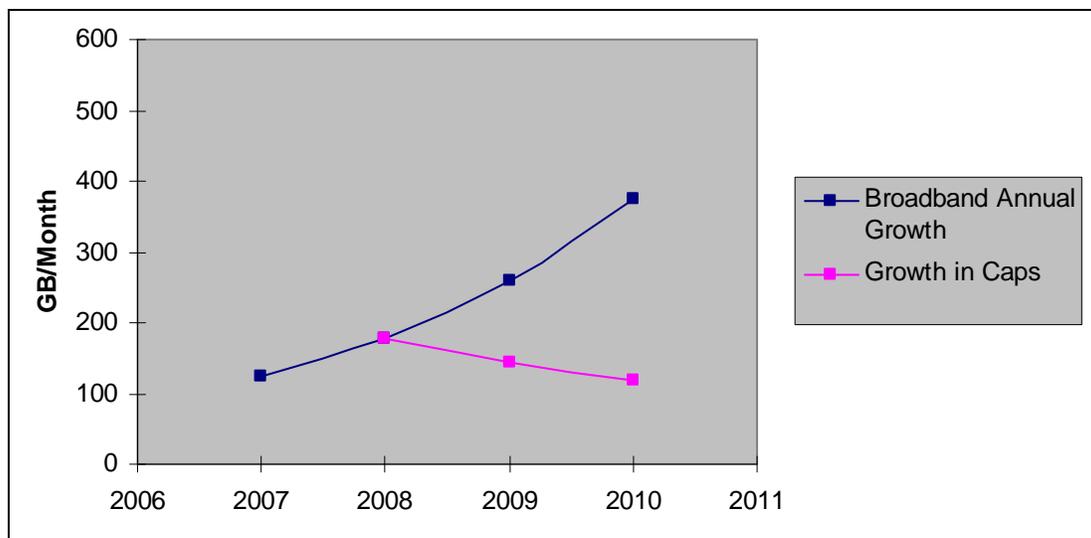


Figure 1: Growth in Broadband Usage v. Growth in Monthly Caps (2010 Projection)²⁴

16 Mbps data category as, in 2009 when these figures were compiled, fewer than 1.0% of Canadians were subscribed to such services (*Ibid.*, Table 5.3.3 Part 1 of 2: 0.6%, to be precise). 1.5 Mbps – 4 Mbps connection caps fell from 43.25 GB/month to 32.20 GB/month on average; 5 Mbps – 9Mbps connection caps fell from 54.18 GB/month to 42.80 GB/month, and 10 Mbps – 15 Mbps connections fell from 80.81 GB/month to 69.53 GB/month, on average.

²³ CRTC Communications Monitoring Report, 2010, Table 5.3.3, Part 2 of 2, <<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr51.htm#t533>>. Note that monthly caps are applied to NET usage – downstream and upstream combined.

²⁴ Figures based on CRTC Communications Monitoring Report, 2010, Table 5.3.3, Part 2 of 2, <<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr51.htm#t533>>. Figures assume 45% annual growth in wireline traffic, represented as annual 45% increase in GB/Month.

How Canada Compares Internationally

16. While Canada's once ascendant status amongst world leaders in Internet provision is no longer Canada is in fact the world leader in this trend to the bottom. OECD comparative data places Canada as one of only two countries with ubiquitous bit cap saturation.

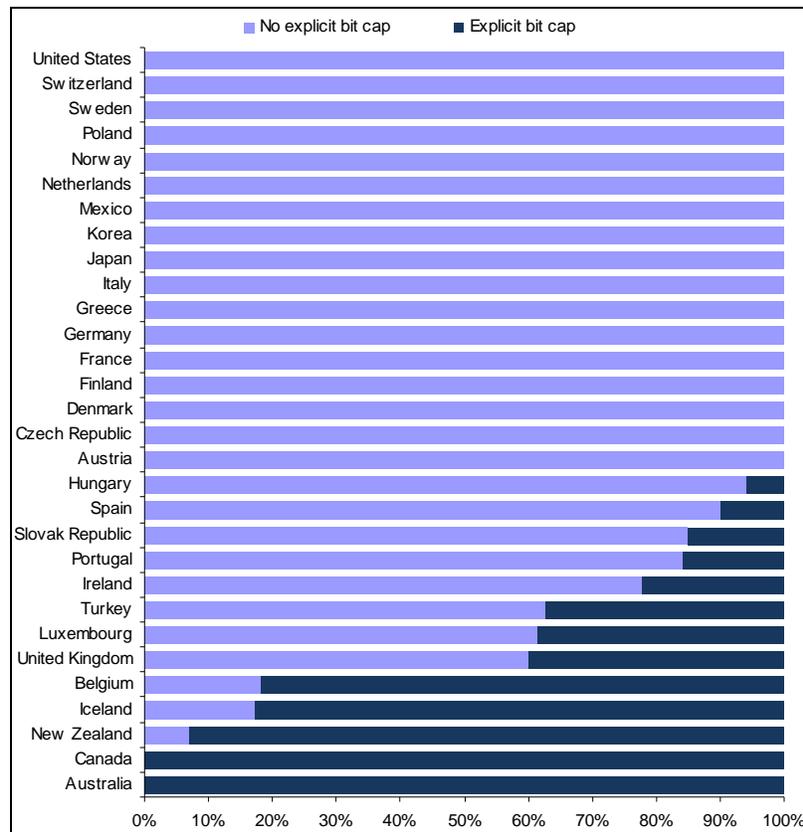


Figure 2: Prevalence of Caps (SOURCE: OECD, Oct 2009)²⁵

17. While international comparisons are challenging, this appears to exacerbate general trends towards high pricing. As noted by CNOC, Canadians already pay dearly for Internet connectivity with very high per advertised Mbps monthly broadband pricing.²⁶

²⁵ Organisation for Economic Co-operation and Development Directorate for Science, Technology and Industry, "Prevalence of explicit bit/data caps among surveyed offers, by country", OECD Broadband Portal, (Oct. 2009), <<http://www.oecd.org/dataoecd/11/38/39575261.xls>>.

Conclusion

18. In sum, at a time when the annual rate of growth in wireline Internet traffic is at a historical low, Canadian incumbents are pushing an aggressive usage-based billing campaign that is outpacing even this marginal level of traffic growth in its race to impose stricter limits on usage. At the same time, revenues continue to climb at a healthy rate:

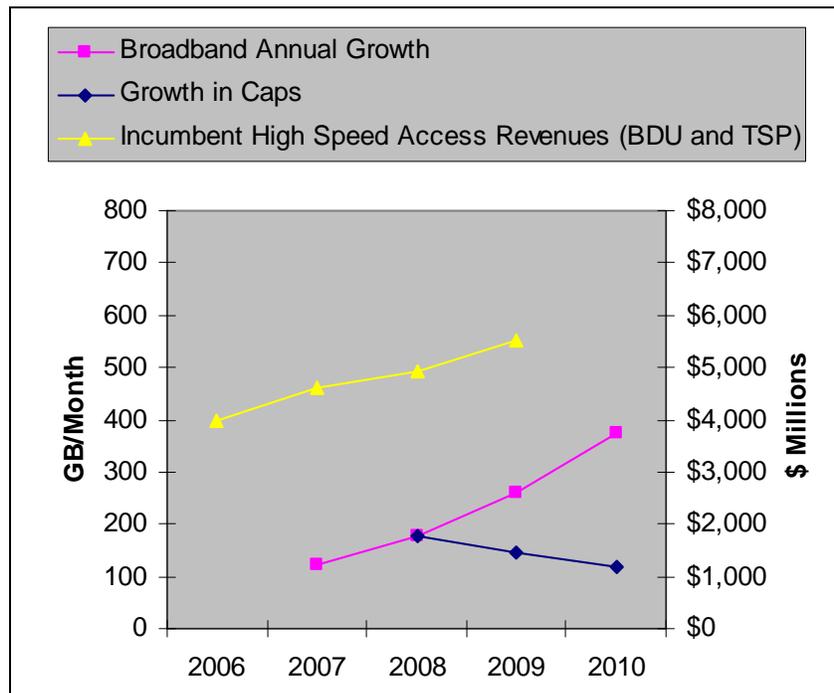


Figure 3: Annual Growth, Revenues, and Caps (2010 projections)²⁷

These trends are troubling, particularly as they are occurring in a time of low annual growth and in that they appear to be relatively unchecked by obvious and sustained customer disapproval of a usage-based pricing model for broadband.

²⁶ Canadian Network Operators Consortium, "Telecom Notice of Consultation CRTC 2011-77, Request for Broadening of Proceeding and Change to Procedure", February 11, 2011, <http://www.crtc.gc.ca/public/partvii/2011/8661/c12_201102350/1509191.PDF>, pp. 2-3.

²⁷ All data based on CRTC Communications Monitoring Report, 2010, Table 5.3.3, Part 2 of 2, <<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr51.htm>>. Monthly cap trends are reproduced in Table 1 and include projections for 2010 based on available figures. Annual growth is assumed at a rate of 45% and is represented in GBs/month for comparative purposes. Annual incumbent high-speed Internet revenues combine TSP and BDU (see note 20 above).

19. Section 7 of the *Telecommunications Act* mandates the Commission with ensuring Canadian access to “reliable and affordable telecommunications services of high quality” that “enrich and strengthen the social and economic fabric of Canada and its regions”. The Commission is also tasked with “encourage[ing] innovation in the provision of telecommunications services.” The runaway economic caps Canadians are currently witnessing are operating to dampen use of the Internet as a medium of communications.

B. CONGESTION MANAGEMENT, DETERRENT, OR REVENUE STREAM?

20. One significant challenge with assessing monthly caps is their inherent similarity to pricing mechanisms. This is compounded by the very loose association between monthly usage and congestion. The result is that monthly caps may be deployed in a manner that has little relation to congestion management – their stated objective. Further, monthly caps are likely to have an overly aggressive impact on Internet usage as they are difficult to calibrate in a manner that is tailored to actual congestion. In general, relying on monthly usage as a mechanism for assessing individual impact on congestion is misleading. In fact, the monthly usage models currently being employed by incumbents in Canada are patently unfair in that, while they do tend to increase incumbent revenues, they impose disproportionate and non-transparent penalties on customers.

Relationship to Congestion: It's Complicated

21. Usage based billing is appealing in character because it plays on a very simple concept: you pay for what you use. In fact, however, the relationship between monthly usage/caps and network congestion is a tenuous one at best. In its initial justification for TN 242 and 7181, Bell points to a “small number of users” who were “generating a disproportionate percentage of the total traffic on the network” and spoke of “differential pricing benefit[ing] both customers and carriers because it

matches price to use, thereby ensuring the heavy users pay rates that are reflective of the relative value they obtain for the service.”²⁸

22. First, it is important to note that ‘usage’ only translates into ‘cost’, for all practical purposes, when it triggers a network investment action. In *CAIP v. Bell*, which led to Telecom Decision CRTC 2008-108, Bell described its provisioning process. Congestion is defined as “a situation whereby the amount of traffic transiting the network may lead to a deterioration in service for some end-users.”²⁹ Deterioration of service is typically estimated in terms of latency or queuing delays.³⁰
23. Bell uses a metric referred to as ‘link utilization’ – the percentage of a given network link’s full capacity that is being used at any given point – as shorthand for actual queuing delays and congestion.³¹ Bell sets link utilization thresholds that have “a very high probability of producing negative impacts on end-users.”³² It should be noted, however, that this correlation is somewhat imprecise and ignores issues raised by lack of speedy signalling resulting from the prevention of dropped packets.³³ Regardless, link utilization is measured in 15 minute increments and a link is deemed ‘congested’ by Bell whenever its link utilization threshold is exceeded “at least once on 5 or more different days of a 14 consecutive day period.”³⁴

²⁸ Bell, Initial Tariff Justification, *supra* note 10, pp. 3-4.

²⁹ TPN CRTC 2008-19, <<http://www.crtc.gc.ca/eng/archive/2008/pt2008-19.htm>>, footnote 6.

³⁰ See D.P. Reed, “Testimony of Dr. David Reed, TPN CRTC 2008-19”, Attachment B to CIPPIC/CDM, “Initial Comments to TPN CRTC 2008-19”, February 23, 2009, [“Reed Testimony”], <http://www.cippic.ca/uploads/File/Attachment_B_pt_1_-_Reed_Report.pdf>, para. 22.

³¹ Bell, “Answer to CAIP Application”, in CRTC File #8622-C51-200805153, *The Canadian Association of Internet Providers’ application regarding Bell Canada’s traffic shaping of its wholesale Gateway Access Service*, July 11, 2008, [“Bell, Answer to CAIP”], <http://www.crtc.gc.ca/public/partvii/2008/8622/c51_200805153_1/926702.zip>, para. 70.

³² *Ibid.*, para. 71.

³³ The use of buffers on network equipment, now becoming endemic, prevents packets from dropping when expected. As the TCP protocol relies on dropped packets to manage traffic, delays in such signalling are deeply problematic and more likely to exacerbate user experience than to aid it. In addition, the correlation between link utilization and actual user impact is imprecise at best: Reed Testimony, *supra* note 30.

³⁴ Bell, Answer to CAIP, *supra* note 31, para. 73.

24. A link that meets this 'congestion' threshold then qualifies for 'active monitoring' which, in turn, may lead to a provisioning action (i.e. investment or cost).³⁵ Usage, on an individual level, only translates into cost where it a.) contributes to excessive link utilization, and b.) triggers an actual provisioning event. Further, congestion on a network does not occur in 15 minute increments, but rather on a second by second basis. Hence the correlation between *usage*, *congestion* and *cost* is very tenuous from the start. The correlation between an individual's *monthly* usage and cost is significantly more tentative.
25. This is perhaps best seen from an examination of peer-to-peer usage, as these are still considered the generators of "a disproportionate percentage of the total traffic on [Bell's] network."³⁶ Networks will typically experience peak period traffic that is anywhere from 72% to 200% higher than non-peak traffic.³⁷ Incumbents must build a network large enough to accommodate this peak period traffic. As such, a 'link utilization threshold' and subsequent provisioning action are less likely to be

³⁵ *Ibid.*, para. 73.

³⁶ Bell, Initial Tariff Justification, 10, pp. 3-4 cites the following in support of this assertion:

Bell Wireline is currently using DPI technology as part of its Internet traffic management solution. As explained in detail in its Answer to CAIP's Application dated 11 July 2008 (see in particular section 8.3), even though the DPI equipment was originally intended to introduce usage data collection functionality for Bell Wireline's usage billing, it was subsequently determined that DPI should also be used for traffic shaping as a necessary measure to address congestion at peak periods. Bell Wireline's initial sampling of traffic usage using DPI revealed that a small number of users were generating a disproportionate percentage of the total traffic on the network, and that a substantial amount of that traffic was P2P. The initial sampling results prompted Bell Wireline to investigate using DPI for purposes of traffic shaping.

Quoted from Bell, "Initial Comments to TPN 2008-19", February 23, 2009, para. 85, my emphasis. It should be noted that P2P traffic has been rapidly decreasing in North America as a component of traffic, but no recent numbers specific to Canadian networks are available at this point.

³⁷ Cisco, "Visual Networking: Usage Study - Highlights", October 25, 2010, <http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/Cisco_VNI_Usage_WP.html> places average peak period usage at approximately 72% higher than average non-peak period usage. Sandvine, "2009 Global Broadband Phenomena - Executive Summary", October 2009, <<http://www.sandvine.com/downloads/documents/2009%20Global%20Broadband%20Phenomena%20-%20Executive%20Summary.pdf>> at p. 3 points to a gradual shift from 30% of peak usage to 100% peak usage over the course of a day while Arbor notes a slightly more gentle shift from 50% of peak usage to 100% peak usage over the course of a day: C. Labovitz, "The Internet After Dark (Part 1)", ["Arbor, Internet at Night"] August 24, 2009, <<http://asert.arbornetworks.com/2009/08/the-internet-after-dark/>>.

triggered in off-peak periods as such thresholds should be large enough to accommodate the much more significant peak period traffic loads.

26. P2P traffic, however, is significantly lower at peak periods (partly due to current ISP throttling practices). In 2008, for example, P2P generated 27% of Bell's traffic over the course of a full 24 hour period. However, during peak periods, P2P only generated 14% of all traffic:

overall, 27 percent of our traffic is peer-to-peer throughout the day, but at peak that number reduces to 14 percent as a result of our shaping of that traffic.³⁸

This has serious implications for the beleaguered P2P user. This user is now being throttled during peak periods, and charged for off-peak usage. She will be charged based upon a 27% monthly usage figure, when in fact only 14% of her usage is even *likely* to impact on Bell's actual costs. Even that is uncertain. This difference was recognized by the Commission in its assessment of the flat-rate component of Bell's TN 242 & 7181, but is ignored in assessing the usage-based component of that same tariff.³⁹

27. This is true for other users as well. While, as noted by Bell, the "majority of users" make most rigorous use of the Internet during peak periods, there is a significant minority that does not do so. This minority is, in effect, being forced to subsidize the 'majority of users' in their peak period usage. Bell explains its reluctance to tax these majority users in its justification for TNs 242 & 7181:

...peak period pricing would require peak charges to occur at the time that customers wanted to use the Internet the most. Peak pricing would therefore require the majority of users, who do not necessarily use the most bandwidth,

³⁸ C. Condon, "Bell - Oral Testimony in Telecom PN CRTC 2008-19", Transcript of Proceeding, July 14, 2009, <<http://www.crtc.gc.ca/eng/transcripts/2009/tt0714.htm>>, line 6042.

³⁹ See Telecom Decision CRTC 2010-255, *The Bell Companies - Applications to Introduce Usage-Based Billing and Other Changes to Gateway Access Services*, May 6, 2010, CRTC Reference Nos.: 8680-V42-200911869 and 8662-T117-200912635, <<http://www.crtc.gc.ca/eng/archive/2010/2010-255.htm>>, paras. 59-60 and 68-89.

to stop using the Internet when they want to use it the most, or, in the alternative, they would actually be incurring price increases.⁴⁰

It is perhaps fortunate that incumbents do not wish to upset the *majority* of their customers and would rather inconvenience a *minority*. However, it must be noted that such an approach is patently unfair and discriminatory in that it imposes the costs of 'majority' peak period use on minority 'off-peak' users.

28. This should *not* be taken as support of peak period pricing. Such pricing schemes will have an increased dampening effect on Canadian Internet use and on innovation, and OpenMedia.ca does *not* support them (see next section). However, it starkly highlights the gap between monthly usage and actual cost, as well as the underlying 'fairness' of any cost recovery process premised on monthly usage.
29. Bell has provided no justification for the correlation between its complex pricing tiers and actual congestion/costs. It simply points to complex incentive structures.⁴¹ Its stated objective for its monthly caps is: "to manage the potential negative outcome of high-consuming bandwidth end-users in a manner that does not degrade service to all end-users."⁴² As noted by Vaxination Informatique:

In its UBB decisions, the Commission confirmed that UBB was accepted at an incumbent dictated rates because it was pitched as an ITMP and not a cost/revenue issue. An ITMP is a method to control network traffic. Its goal is to have a large display at a network operations centre remain free of little red lights that indicate congestion.⁴³

⁴⁰ Bell, "Disclosure of Confidential Information Provided in Confidence to the Commission", November 13, 2009, The Companies(CRTC)20Aug09-1, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1315236.zip>>, p. 16.

⁴¹ Bell, "TN242 & TN7181 Interrogatory Responses", October 5, 2009, The Companies(CRTC)20Aug09-1, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1281758.zip>>, p. 12.

⁴² Bell, "TN242 & TN7181 Interrogatory Responses", October 5, 2009, The Companies(CRTC)20Aug09-1, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1281758.zip>>, p. 12.

⁴³ Vaxination Informatique, ""Telecom Notice of Consultation CRTC 2011-77, *Review of billing practices for wholesale residential high-speed access services*, File number: 8661-C12-201102350, Re: Request for Broadening of

An ITMP must be subject to the Commission's ITMP framework. However, the current nature, pricing, uniformity and prevalence of incumbent-imposed monthly caps fail this justification process. They are not narrowly tailored to their stated objective of managing congestion and now appear to be operating as a cost-recovery or revenue-producing mechanism.⁴⁴ They are not narrowly tailored responses intended to "address temporary network capacity constraints and changing network conditions."⁴⁵

30. The correlation between incumbent's target "high-consuming bandwidth end-users" and actual cases of provisioning actions must be assessed if the efficacy of current monthly billing practices as a congestion management mechanism (as opposed to economic measures in the abstract) is to be measured. The flat rate provisioning/consumption component of Bell's TN242/7181 suggests that this correlation is, indeed, quite loose at best.⁴⁶ In particular, as an ITMP, it is necessary to understand how much actual 'cost' is generated by target 'high -consuming bandwidth end-users' as well as how effective monthly caps are in reducing this *specific* cost as opposed to costs in general (see next section) or to simple revenue generation (see section after next).

Deterrent to Internet Usage

31. While putatively aimed at deterring the so-called 'bandwidth hogs' it is not clear that current ITMPs are targeting this demographic. Bell, for example, has put in place a complex and intricate series of caps that include insurance regimes and

Proceeding and Change to Procedure", February 17, 2011, <http://www.crtc.gc.ca/public/partvii/2011/8661/c12_201102350/1512638.PDF>, para. 17.

⁴⁴ See Geist, *supra* note 21, and accompanying text.

⁴⁵ TRP CRTC 2009-657, *supra* note 1, paras. 35-36.

⁴⁶ Bell, "Disclosure of Confidential Information Provided in Confidence to the Commission", November 13, 2009, The Companies(CRTC)20Aug09-8, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1281758.zip>>, p. 2.

multiple tiers of pricing. The costs imposed by this model are, in Bell's own admission, punitive.

32. We take the example of Bell's current Ontario 2.8 Mbps connection (\$29.95/month) offering as generally indicative.⁴⁷ An average customer (Alice) subscribing to this service reaches her first monthly usage disincentive at the 2 GB mark. At this point, Alice is faced with overage charges of \$0.25/100 MB.⁴⁸ This disincentive continues until she reaches the 24 GB mark (\$60/month) or roughly double her initial monthly bill. After reaching the 24 GB mark, Alice is given carte blanche to continue using her connection unchecked until she reaches the 300 GB mark. At this stage, a second disincentive begins at a rate of \$0.10/100 MB.⁴⁹
33. This model is not designed to capture 'excessive users' or bandwidth hogs. While the definition of a 'bandwidth hog' may be hotly debated, few would disagree that it requires more than 2 GB/month of usage. This pricing model is intended to deter light users such as Alice from using more than 2 GB/month or, alternatively, to either buy into additional 'insurance' schemes or pay heavy penalties when exceeding monthly limits.
34. Bell offers insurance schemes. For example, an additional \$5/month (an 18% increase on the initial plan) will provide Alice with a 40 GB/month block of added bandwidth.⁵⁰ Other insurance plans are available at higher rates. The overall effect of this scheme is to force users to guess ahead of time what their monthly usage will

⁴⁷ See Bell Canada, "Essential Plus", Home / Shop / Internet / Internet Services, <http://www.bell.ca/shopping/en_CA_ON.Essential-Plus/DSLTIPlusNCOONNewMass.details>. last accessed March 27, 2011. The service offers speeds of up to 2 Mbps downstream and 800 Kbps upstream. Customers are provided a \$5/month discount from the base rate of \$34.95 and additional discounts for bundling.

⁴⁸ Bell, "Plans", Home / Support / Internet / My Internet Usage / Plans, <http://internet.bell.ca/index.cfm?method=content.view&content_id=17737>. Bell notes that overage is "billed in increments of 100 MB for the Essential Plus plan".

⁴⁹ Bell, "Understand Your First Bill", Home / Support / Internet / My Internet Usage / Plans, <http://internet.bell.ca/index.cfm?method=content.view&content_id=17647>.

⁵⁰ Bell, "40GB Usage Insurance Plan", Home / Shop / Internet / Security and features / Enhanced services, <<http://www.bell.ca/shopping/40-GB-Usage-Insurance-Plan/VasIntInsurance.details>>.

- be. As no discounts are offered for months where this ‘insurance’ is unused,⁵¹ Alice will be at a continuing disadvantage in that she will need to either overestimate her upcoming monthly usage, face the risk of high penalties, or curb her usage to very low rates (2 GB/month).
35. Such a scheme does not appear calculated to curb ‘excessive usage’ or ‘bandwidth hogs’. It appears more carefully calibrated towards imposing downward pressure on *all* usage at *all* levels. Bell points to a decrease in average monthly usage amongst GAS customers, from 30.35 GB/month in Sept 2008 to 26.62 GB/month in July 2009 – a 12% decrease, as evidence of a.) the intended effect of its UBB; b.) proof of its success.⁵²
36. These figures represent depression of average usage, not excessive users. It is an open question, in OpenMedia.ca’s view, whether such blanket suppression is desirable. In our view, the ISPs should be looking for ways to encourage use of the Internet, not discouraging it. As Andrew Odlyzko notes, the optimal economic outcome in this scenario is not a usage-based one. Odlyzko draws on vast historical repositories of economic bundling models to conclude that the most efficient solution for Internet usage is a flat rate one.⁵³
37. Such a model, in fact, is more likely to lead to *higher* monthly rates for ISPs than a usage based model:

Metered rates have obvious attractions to service providers. Their basic incentive is to charge according to value, ideally collecting \$5 for the 45-character text to your significant other, warning that you are stuck in traffic and

⁵¹ *Ibid.* In fact, customers must give 30 day advance notification before cancelling an insurance plan. Unused bandwidth does not carry over to future months.

⁵² Bell, “TN242 & TN7181 Interrogatory Responses”, October 5, 2009, The Companies(CRTC)20Aug09-1, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1281758.zip>>, pp. 14-15.

⁵³ A. Odlyzko, “Pricing Tragi-Comedy”, (2011), <<http://www.dtc.umn.edu/~odlyzko/doc/pricing.tragi.comedy.txt>>.

won't make it back in time for dinner, while letting you watch a crummy 2-GB movie for 5 cents.

There is nothing immoral or unethical about such moves, but they are constrained by technical feasibility, as well as by competition. Furthermore, they have almost always been limited by legal and regulatory measures (such as common carrier rules). The reasons for such limitations are grounded in public concerns about fairness, as well as about not introducing distortions in the rest of the economy. The problem is that untrammelled pricing power (especially by monopoly or oligopoly telecom or transportation providers) has effects similar to that of a lack of secure property rights in limiting innovation.

Fine-grained pricing practices have also been limited by public preferences, in ways that have almost always been underappreciated by the telecom industry. Simple, ideally flat-rate, pricing has been preferred by customers. There is abundant evidence for this preference from decades of telecom experience, as well as from more recent behavioral economics research.⁵⁴

Odlyzko continues to state that, in spite of these apparent incentives, flat rate pricing is, in fact, more likely to lead not only to greater use by Alice, but also to greater revenues by the ISP, as Alice will be willing to spend more for a 'flat' rate than for any perceived fine-grained pricing scheme.⁵⁵

38. In sum, not only is it unclear whether the CRTC should be endorsing attempts to depress usage or whether such activity is economically efficient, but it is not even clear whether such actions are in an ISP's interest or whether their prevalence is merely the result of perverse market incentives.

Revenue-Generating Mechanisms

39. As noted by Vaxination Informatique, before current monthly UBB practices can be properly assessed, it is crucial to determine whether these are 'ITMPs' aimed at addressing congestion or whether they are simply pricing mechanisms.⁵⁶ Bell, in its

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

⁵⁶ Vaxination Informatique, "Telecom Notice of Consultation CRTC 2011-77, *Review of billing practices for wholesale residential high-speed access services*, File number: 8661-C12-201102350, Re: Request for Broadening of

interrogatory responses in the TN242/7181 proceeding, certainly appears to treat its monthly caps as pricing mechanisms:

...forces in the retail market are leading service providers to implement usage-based rating models for end-users. In addition, most of the cable carriers have introduced usage-based rating models for their wholesale TPIA services. Any regulatory measure which would deny the Companies the opportunity to implement similar usage-based charges for their wholesale customers would interfere with the requirements of the Policy Direction to rely on market forces to the maximum extent possible.⁵⁷

If current monthly pricing mechanisms are driven by ‘forces in the retail market’ than OpenMedia.ca respectfully submits these are monopolistic or, at best, oligopolistic forces. Regardless, ITMPs are not driven by “forces in the retail market” but by the need to address congestion.

40. As noted above, OpenMedia.ca does not believe that incumbents are capable of justifying their current monthly caps under the ITMP framework. While the above-cited passage appears to indicate that Bell, at least, views its bit caps as pricing mechanisms, it is certainly not portraying them as such. They have consistently presented such measures as attempts to “manage the potential negative outcome of high-consuming bandwidth end-users in a manner that does not degrade service to all end-users.”⁵⁸

Proceeding and Change to Procedure”, February 17, 2011, <http://www.crtc.gc.ca/public/partvii/2011/8661/c12_201102350/1512638.PDF>, para. 17:

With the 2011-77 consultation, the Commission seeks to find a fair and reasonable method of billing for either wholesale GAS/TPIA or for retail ISP customers, depending on whether the Commission intends to regulate retail ISP business or not. This implies that the current billing paradigm does not fit this criteria.

⁵⁷ Bell, “TN242 & TN7181 Interrogatory Responses”, October 5, 2009, The Companies(CRTC)20Aug09-1, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1281758.zip>>, pp. 12-13, my emphasis.

⁵⁸ Bell, “TN242 & TN7181 Interrogatory Responses”, October 5, 2009, The Companies(CRTC)20Aug09-1, Abridged, Supplemental, File Nos.: 8740-B2-200904989 & 8740-B54-200904971, <<http://www.crtc.gc.ca/public/8740/2009/b2/1281758.zip>>, p. 12.

Conclusion

41. As the ITMP framework applies to all markets, whether in the retail or wholesale market, such an assessment is not outside the scope of this proceeding and incumbents should be made to justify their monthly caps. In addition, while Internet pricing is foreborne, the Commission may assess Bell's UBB wholesale tariffs in order to determine whether these are just and reasonable. Irrespective of the specific mechanism(s) ultimately employed by the Commission, OpenMedia.ca submits that the current monthly bit cap market is undisciplined and demands regulatory attention.

II. IMPOSING MONTHLY CAPS ON WHOLESALE SERVICES

42. As noted above, it is OpenMedia.ca's opinion that the Commission should take steps to curb current endemic use of monthly caps in Canada. One regulatory tool that will allow the Commission to attempt this endeavour is competitive wholesale pressure. This has been the traditional mechanism by which the Commission has attempted to ensure fair and reasonable pricing in the telecommunications industry.
43. Bell points to higher average monthly usage by GAS customers than on its own lines in justification for the imposition of caps on its wholesale services. In OpenMedia.ca's view, this is precisely the function that the GAS tariff is intended to serve. It is intended to prevent incumbent ISPs such as Bell from imposing pricing mechanisms at will by providing an alternative for some customers who wish to do more. The continuing capacity of wholesale competitors to provide such alternatives and such competitive pressures is necessary.
44. As such, the Commission should not permit Bell to impose any form of monthly usage billing onto its wholesale subscribers. While actual provisioning costs imposed by the GAS tariff should not be ignored, these should be included in the flat rate provisioning component of the GAS tariff and should not be imposed on a per customer, per usage basis. This will require demonstrating a clear connection

between actual incumbent costs and tariff elements, and should be applied to cable wholesale as well.

45. However, it should be noted that OpenMedia.ca is sceptical at the ultimate efficacy of this solution. As wholesale currently accounts for no more than 6% of Canadian Internet revenues, it is unlikely that a purely wholesale solution will be capable of checking what has become a rampant race to the bottom of the bit cap barrel in Canada. In this sense, while freeing the wholesale competitors from any usage-based restrictions is certainly necessary, it is not likely, in and of itself, to be sufficient.

All of which we very respectfully submit.

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