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**Rethinking Universal Service for the 21st Century and an
All-IP World**

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Rethinking Universal Service for the 21st Century and an All-IP World

1. Good morning Chairman Blais, Commissioners. My name is Dwayne Winseck. I am a professor at Carleton University's School of Journalism and Communication, and Director of the Canadian Media Concentration Research Project. Before I start, I would like to thank you for inviting me to be here. I also want to thank several students who helped me to prepare parts of my submission to you: Ben Klass, Holly Price and Chelsea Nash.

Universal Service: Historical Touchstones, Contemporary Guides

2. Canadians use the internet, mobile phones and other communications media a lot. Indeed, we have always been big users of communications by international standards. The CRTC's review of basic service offers a valuable opportunity to reflect on these realities and to replicate the achievements of telephone-based universal service of the last century so that our communication systems can better serve our evolving needs as well as the public interest in the evermore IP-centric world of today.
3. Policy makers have debated how best to achieve universal service for over 100 years and have relied on a variety of tools to pursue that goal ever since: regulated monopolies, competition, charters granted for the general advantage of Canada, price-cap regulation, obligations to serve, encouraging investment, forbearance, cross-subsidies, and so on -- each of these tools has at one time or another contributed to improving people's access to modern telecommunications services. People have also agitated for such goals, beginning with the post office, then POTs (i.e. plain old telephone service), libraries, broadcasting and now the Internet.
4. The original goal of the U.S. Post Office, for example, was to bring "general intelligence to every man's [sic] doorstep", while also serving as a heavily subsidized vehicle for delivering newspapers across the country with the aim of helping the nation's journalism flourish. It largely worked. Universal postal policy, in short, was also press, information, social and economic policy, all rolled into one. People also pushed hard to transform the telephone from a luxury good and tool of business and government into a social necessity, and a popular means of personal communication.
5. In an all-IP world, universal service can build upon this history by not only bringing intelligence to every citizens' doorstep but by helping to make that doorstep the perch from which we can see and speak to the world.
6. Establishing appropriate standards and the right level of adoption is no doubt difficult, but the OECD, for instance, points to the highpoint of wireline

POTS penetration levels as a proxy for desired levels of broadband adoption. As FCC Chairman Wheeler is fond of stating, neither the concept of broadband nor universal service is static; both must be continuously revisited in light of emergent “telecommunications services” and people’s needs. When Verizon claimed last year that the existing US standard of broadband access was “popular and worth keeping”, the FCC dismissed its comments as self-serving, and adopted a new standard of 25 Mbps down and 3 Mbps to be available to *all* Americans in a timely fashion.

7. At a minimum, we urge the CRTC to do the same by (1) including broadband internet into the concept of universal basic service and (2) restricting the excessive use of data caps that we find in Canada. We also urge the Commission to (3) focus as much on adoption and affordability as geography and access in its own research and reporting, and to work more closely and coherently with Innovation, Science and Economic Development Canada on the issues of (4) broadband subsidies, (5) spectrum policy, and (6) fostering competitive markets.

Broadband Access and Universal Service Objectives in the Real World: Beyond Aspirational Targets and Paper Tigers

8. Several rationales support the adoption of universal service policies: (1) economic benefits for individuals and the economy; (2) communication networks display public utility characteristics, and thus have an obligation to serve; (3) network effects whereby the value of a network increases the more people and services are connected; (4) mitigating social exclusion and the impact of inequalities on people’s quality of life; (5) ensuring contact with emergency services; and (6) the recognition that the internet is now essential for the practical exercise of freedom of expression and access to information, health services and education.
9. The pursuit of universal service must also be mindful of (1) the cost of achieving it; (2) interfering with market forces that could deter network development; (3) reinforcing incumbent firms’ dominance by requiring others to finance their network expansion in underserved areas; and (4) the need to be “future proof” so as not to lock in developments down the road into the standards of today.
10. Of course, there is no one-size-fits-all approach to universal service policies. Most countries do not **legislate** specific broadband speed benchmarks. Instead, the normal practice is to pursue broadband targets as a matter of **public policy**, developed and back-stopped by regulators and policy-makers that have the legal and political mandate to do what they need to do to achieve outcomes that are in the public interest.

11. The number of national broadband plans worldwide soared from 34 in 2007 to 148 in 2014. When done well, such initiatives set out meaningful and achievable broadband access *and* adoption goals, allocate resources fit for the task and also establish specific timelines.
12. Let's take an example to illustrate the point: the United States. In 2015, the FCC set the goal of ensuring that "**all** Americans" have *access* to "*actual* download speeds of at least 25 Mbps and *actual* upload speeds of at least 3 Mbps". Crucially, it did not point to an explicit legal standard to justify its decision but argued that the *Telecommunications Act* requires it to take steps to ensure that **all** Americans have the "capability . . . to originate and receive high-quality voice, data, graphics, and video services".
13. Of course, the *Telecommunications Act* in Canada contains similar provisions that give the Commission with plenty of room to pursue a similar course of action.
14. The FCC's speed targets do *not* include *adoption* goals, but it does pursue such aims through other tools, backed by substantial amounts of funding, notably the Connect America Fund and Mobility Fund, that aim to help extend 3G and 4G wireless networks to people who would otherwise probably not be served. The FCC also added a sense of urgency to its efforts by requiring its targets to be met "in a reasonable and timely fashion".
15. The European Commission's (2010) *Digital Agenda for Europe* is also instructive for at least four reasons.
16. First, the *Digital Agenda* is not a formal **legal standard** but a set of policy pillars designed to promote: 1) Connectivity (wireline and mobile access, adoption, speed, affordability); 2) human capital (skills development); 3) internet use; 4) business integration of digital technology; and 5) Digital Public Services.
17. Second, the *Digital Agenda*'s central aims are much more ambitious than those of the FCC or the CRTC:
 - a. all European will have basic broadband by 2013;
 - b. all Europeans will have internet *access* above 30 Mbps by 2020;
 - c. at least half of European households will *subscribe* to internet connections above 100 Mbps by 2020".
18. The EC's push for 100 Mbps speeds is obviously much higher than US or Canadian standards but equally important is that it links this target to a specific broadband **adoption** goal: at least half of all EU households will subscribe to internet services with 100 Mbps capability or more by 2020.

This focus on *adoption* goes beyond the FCC and CRTC's emphasis on *access*.

19. Third, the *Digital Agenda* is a guide not a fixed template. Some of the 28 EU countries see it as a floor from which to pursue more ambitious efforts (e.g. Austria, Denmark, Estonia, Finland, Luxembourg, Netherlands, Sweden, the UK), while less well-off Central and Eastern European countries tend to see its goals as worth striving for (e.g. Bulgaria, Croatia, Hungary, the Slovak Republic, Slovenia). The caricature of a single EU broadband model is a myth -- individual countries within the EU have flexibility in pursuing broadband policies that meet their specific needs and circumstances, which are widely divergent between Austria through to the UK.
20. We have compiled a review of such policies for the 41 countries that comprise the OECD and EU to help illustrate these points. It was submitted to this proceeding in November, and is also attached to our notes for today's hearing (see Appendix 1 to our response to Telus' interrogatory of November 2).
21. Fourth, the *Digital Agenda* has sparked significant amounts of government investment in broadband projects. The vast majority of these projects (104 out of 136 as of July 2015) have taken place in the wake of the 2008 financial crisis, the adoption of new rules for state aid to broadband and the adoption of the *Digital Agenda*.
22. Some EU countries do not use subsidies (e.g. Belgium and the Netherlands), but most do (22 out of 28) to varying extents. At the low end of the scale, spending in Ireland, Bulgaria, Romania, Austria and Cyprus sits between \$3.18 and \$13.02 (CDN) per capita between 2009 and 2014, while Sweden, Poland, the UK, Germany, Finland and Latvia are at the mid-to high-end of the scale with investments ranging from \$21.68 to \$86 per person over this period. New Zealand and Australia are investing \$25 and \$163, per person, per year, respectively on their broadband initiatives.
23. Total federal subsidies in Canada over this period were \$11.75 per capita, or less than \$2 per person per year. The CBC, in contrast, received nearly \$200.00 per capita, or roughly \$33.26 per person per year. The Liberal Government's recent pledge of \$500 million in broadband funding for the next five years, however, barely moves the dial. Failing a dramatic change in thinking by the federal government, the CRTC needs to step in to shore up the federal governments limited efforts.

Putting People @ the Centre of Broadband Policy

24. Too often Canadian policy makers and incumbent operators exude a sense of complacency, shining a bright light on broadband access and the

country's vast geography while down playing issues of affordability and adoption. But just how well do we do on all of these measures?

Access and Broadband Speeds

25. Indeed, access to basic broadband (≥ 1.5 to 2 Mbps) is nearly universal In Canada, the US and the EU. Canada does have coverage levels that are higher than the EU *average* for NGA broadband access (≥ 25 -30 Mbps) and ultrafast broadband (≥ 100 Mbps), but there are a dozen or more countries in both cases that do as well as or better than Canada: Belgium, Denmark, Germany, Hungary, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Spain and Switzerland.
26. When it comes to FTTP access – the information infrastructure of the 21st century -- the EU *average* (19%) was more than triple that in Canada (6.2%) and more than double the U.S. (7.6%) in 2014. Half of all homes, or more, have access to FTTP in Denmark, Estonia, Lithuania, Latvia, Portugal, Romania, and Sweden.
27. While 4G LTE coverage had been significantly greater In Canada than the EU average, by the end of 2014 the gap had mostly vanished. Similar or higher levels of access were achieved in Germany and Finland (92%), Ireland (87%) and the UK (84%); the U.S. (98%), Denmark and Sweden (99%), and the Netherlands (100%) topped the charts. The fashionable idea in some circles that the “EU Model” has been a failure relative to the accomplishments of the “Canadian” and “American” models is a myth.
28. Moreover, while people get close to the advertised speeds they pay for, mean actual download speeds of 18.1 Mbps means that Canada ranks 23rd out of 34 OECD countries.
29. Studying the European situation can certainly be informative, but drawing general conclusions from the diverse circumstances that characterize broadband amongst the 28 nations comprising the EU should not replace an analysis of the Canadian situation on its own merits and shortcomings.
30. Looking closer to home, the CRTC's goal that all Canadians should have access to broadband of at least 5 Mbps by 2015 has not been met. Less than three-quarters of residents in rural areas have access to such speeds and wireless internet access is not an acceptable substitute given its high price, latency, and other technical and economic limitations.
31. The gap between availability -- and adoption -- also grows quickly with each step up the ladder of speed, as Table 1 below illustrates.

Table 1: Broadband Internet Speed, Availability and Adoption, 2013

Speed	Availability	Adoption
≥ 5 Mbps	95%	92%
≥ 10 Mbps	84%	57%
≥ 16 Mbps	82%	31%
≥ 50 Mbps	78%	5% ¹
≥ 100 Mbps	60%	NA

Source: CRTC 2014, Tables 5.3.10, 5.3.12.

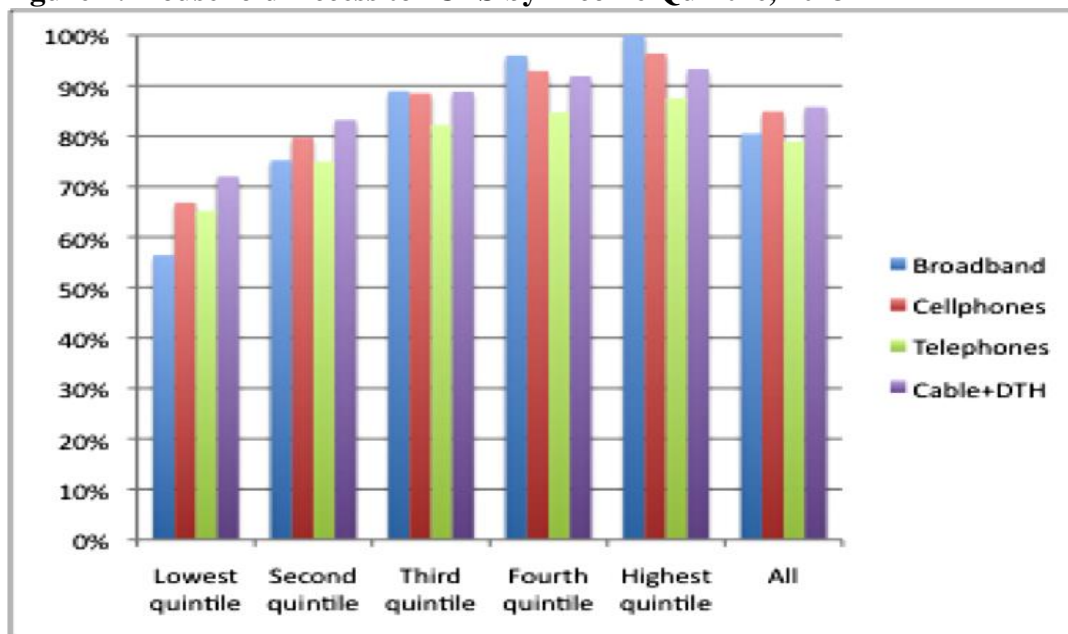
32. For speeds of 50 Mbps and above, for example, only one-quarter of homes had access to more than one provider at the end of 2013, while at speeds above 100 Mbps, 92% of households faced no choice at all. The lessening of competition at higher speed tiers is also likely to contribute to affordability and adoption issues, but we do not know for sure because the data needed to understand the link is unavailable.

Adoption, Affordability and Inequality

33. For all that success in *access* is important, Canada does not do as well when it comes to *adoption*. The broadband internet adoption gap between the richest and poorest Canadians is stark. While 4-out-of-5 Canadians have broadband internet, the rest do not. More than 2-out-of-every 5 households in the lowest income bracket do not have broadband, and one-third do not have a mobile phone. By contrast, adoption rates at the top end of the income scale are over 95%.

¹ Corrected from original. Clerical error led to “adoption rates” for ≥ 16 Mbps and ≥ 50 Mbps being repeated, and the 5% figure for ≥ 50 Mbps being placed in the ≥ 100 Mbps row.

Figure 1: Household Access to ICTS by Income Quintile, 2013



Source: Statistics Canada, 2015. *Survey of Household Spending*.

34. In terms of wireline broadband adoption rates, Canada was seventh out of 30 OECD member countries in 2005, but fell to 11th place in 2010 where it has stayed since (of 34 countries).² For mobile wireless, Canada placed 21st out of 30 countries in 2010 but by 2014 that rank had dropped to 26th.
35. What explains these trends? Do poor Canadians not want internet access?
36. Study after study consistently points to one thing that explains our low rates of adoption: the high price of broadband services in Canada, as our review of the latest Wall, OECD and the FCC reports shows. Defenders of the status quo, however, argue that Canada fares well in terms of how much we pay for mobile phone service relative to income (.68% of GNI) (which ranks 36th-out-of-182 countries worldwide) and even better for fixed broadband at 25th, with people spending 1% of their income on a subscription – similar to Denmark and the Netherlands and better than Germany or Australia, for instance, and 155 other countries in the world.³
37. But comparing Canada to the “rest-of-the-world” makes little sense. A more relevant comparison is to the 39 countries that make up the OECD and EU countries. When we do this, Canada ranks in the middle of the pack. Switch to purchasing power parity, moreover, and Canada’s rank plummets to 33rd out of 39 countries for wireline and 24th for wireless.

² Erratum: the rankings were off by one place for each year in the original submission.

³ ITU (2015). *Measuring the Information Society*, pp. 102-109. <http://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2015/MISR2015-w5.pdf>

38. These results from the ITU are also consistent with latest findings of the Wall, OECD and FCC's studies. Canada does not fare well in the results of the Wall study across the board, with few exceptions. It finds, for example, that wireline prices have risen steadily at rates well above inflation over the past five years. Canada has "slipped from being in the middle to . . . the higher end of the group". The price of the lowest level wireless plan "is the highest of the group" while for mid- and high-end plans, Canada is "on the high side of the group". The same is true for the two highest usage tiers. Mobile Internet prices are higher than in the European countries surveyed and Australia -- "by a substantial margin in many cases". Data caps in Canada and Australia are prevalent but mostly non-existent elsewhere.
39. The FCC's *International Broadband Data Report* analyzes a wide range of broadband plans across forty countries. Its results show that prices for wireline broadband in Canada consistently fall on the high side. The most recent data (2013) available when we wrote our submission shows that the standalone price for wireline broadband service in Canada ranked 27th out of 31 countries, and things were getting worse over time, not better.
40. While there are difficulties in finding a reasonable basis to compare mobile wireless pricing because of rapid changes in services and pricing plans over time, we were able to compare three types of smartphone plans:
 - a. Small Smartphone Data Plans with Usage Limits of <1 GB and Limited minutes: Canadian data was unavailable for 2013, but based on 2012 data it ranked 23rd out of 30 countries in terms of mean average monthly price and 27th in terms of the cost of data on a per GB basis.
 - b. Medium Smartphone Data Plan with Usage Limits of ≥1 to <5 GB and Unlimited Minutes: Canada fares marginally better at this level, ranking 17th out of 26 countries in 2013. The mean monthly cost for the mid-range wireless smartphone plan in Canada was above the average but below US prices. The cost of a GB in Canada was more than USD \$36 versus half that amount in Australia, or USD \$9.55 in France or USD \$11.03 in Denmark. Canada ranked 20th out of the 26 countries on this measure, while the U.S. does worse.
 - c. Large Smartphone Data Plans with Usage Limits of ≥5 GB and Unlimited Minutes: while the available data was limited to 15 countries at this level, Canada ranked 12th and the price of a GB was \$11.47 (USD PPP) versus \$3 in Denmark and between \$6.50 to \$7 in Australia and the UK, respectively. The OECD average was \$8.80.
41. Recent OECD data on prices for a dozen-and-a-half fixed broadband baskets confirms the point, as Table 2 shows: Canadian prices are above

average in all but two cases and consistently in the bottom quartile relative to its peers.

Table 2. Broadband Pricing in Canada vs OECD Peers Across Speed Ranges (September 2014)			
Broadband Basket	Canada Rank	Canadian Price	OECD Avg Price
5 GB/month, ≥.250 Mb/s	29 / 34	36.97	27.73
2.5 GB/month, ≥1.5 Mb/s	30 / 34	36.97	28.01
10 GB/month, ≥10.2 Mb/s	28 / 34	44.32	31.17
15 GB/month, ≥25/30 Mb/s	26 / 34	47.13	37.73
25 GB/month, ≥102.4 Mb/s	28 / 34	73.05	76.53
100 GB/month, ≥1024 Mb/s	##	##	##
10 GB/month, ≥.250 Mb/s	29 / 34	36.97	27.81
15 GB/month, ≥1.5/2 Mb/s	28 / 34	36.97	28.17
25 GB/month, ≥10.2 Mb/s	28 / 34	44.32	31.25
50 GB/month, ≥ 25/30 Mb/s	26 / 34	47.13	37.73
100 GB/month, ≥102.4 Mb/s	28 / 34	73.05	76.53
250 GB/month, ≥1024 Mb/s	##	##	##
25 GB/month, ≥.250 Mb/s	28 / 34	36.97	27.86
50 GB/month, ≥1.5/2 Mb/s	33 / 34	44.32	28.38
100 GB/month, ≥10.2 Mb/s	27 / 34	44.79	31.66
200 GB/month, ≥25/30 Mb/s	25 / 34	48.47	38.81
400 GB/month, ≥ 102.4 Mb/s	29 / 34	79.31	77.04
1000 GB/month, ≥1024 Mb/s	##	##	##

Source: OECD Broadband Portal (2015) Fixed Broadband Basket Prices, September 2014. <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm>

42. Some operators and their hired experts assert that these comparative studies are fundamentally flawed. Telus' hired expert, for example, asserts:

. . . the OECD lists only one carrier in each country for each basket . . . For Canada, however, it appears to extract list prices only from Bell. Thus, it is very difficult to reach any conclusions about the relative price of Canadian fixed-wire broadband service from these tabulations (Crandall, 2016, para 31).

43. This criticism is incorrect. As a matter of fact, the OECD uses four operators to construct its wireline broadband baskets: Bell, Shaw, Videotron and Rogers. For mobile wireless baskets, three operators are compared: Bell, Rogers and Telus.⁴ Most of the other criticisms are similarly misplaced.

⁴ The names of the operators are available on request from the OECD, but see OECD (2011) *Methodology for constructing wireless broadband price baskets*, where it outlines the "General Basket Rules": "At least the two largest network operators are covered for each country, based on subscriber numbers. If the underlying data are available, the two largest wireless broadband operators, in terms of subscribers, could be chosen instead. For those countries in which these two largest operators account for less than 70% of the market, the third largest operator will also be included. This could also apply to countries with three national network operators only."

How People Actually Use Broadband Internet

44. When determining what levels of service should be available to everyone, we need to consider how people are using those services today, and how their uses will evolve in the future.
45. What we see is that Canadians have always been extensive users of telecommunications and other 'electronic media' since the earliest days of the telegraph and telephone. They still are by international standards in terms of the amount of time spent using the internet, data uploaded and downloaded, watching Netflix and Youtube, sharing photos, consuming news, etc. There's no reason to believe that our use of communication networks will slow down in the future; in fact, the evidence suggests the opposite.
46. Internet traffic in Canada is expected to reach 166.8 gigabytes per household per month by 2019, while each Internet user is projected to generate 74.0 GBs of internet traffic -- triple what it was in 2014. A variety of services already require more than today's 5Mbps downstream standard for "performance consistency", according to the CRTC: e.g. video conferencing, SD IPTV, HD IPTV, HD video streaming, software downloads, and video downloads. As the online activities of Canadians evolve, so too do their requirements for greater bandwidth. Whatever standards for broadband the Commission sets its sights on must take growing needs for bandwidth into account.

Video

47. High definition video streaming is the most obvious example of a service that requires bandwidth in excess of the current basic service requirement of 5Mbps download/1Mbps upload. Netflix ranks #1 as the single highest downstream application. Together with Youtube, it accounts for half of aggregate internet traffic. Netflix recommends a speed of 5.0 Mbps as well for HD quality video, and 25 Mbps for Ultra HD quality streaming. Even the carriers' own websites advertise that "moderate levels of streaming audio/video" require speeds of 25 Mbps, while pushing heavy users to their 50 or 100 Mbps service.
48. In contrast to their marketing materials, however, the incumbents urge the CRTC to base any revised concept of basic broadband service strictly on "serious uses". However, before we follow that advice, we must remember that what people do with the media at their disposal has long been cast by others as being second in line to more 'important' uses, and often frowned

Discount brands offered by the network operators will only be included when clearly linked with the network operator's website and brand" (pp. 3-4). <http://dx.doi.org/10.1787/5k92wd5kw0nw-en>.

upon and discouraged. In the early 20th century, for example, the US Supreme Court denied First Amendment protection to movies because they were seen as crassly commercial, and aimed at entertaining the masses rather than drawing them into the political life of the nation. Women's use of the telephone was similarly discouraged.

49. Stakeholders such as DISH, Netflix and Public Knowledge strenuously argued against this view in the US when the FCC reviewed its broadband internet target speeds. The high levels of vertical integration between the TV industry and ISPs, however, will likely dampen such pressures here, but the Commission should keep such issues front of mind all the same.

Multiple users, many devices and multiplying connections

50. We urge the Commission to also take better account of households running multiple devices when assessing broadband needs. Indeed, Cisco observes that North Americans had an average of 6.1 devices and connections in 2014, while predicting that this number will increase to 11.6 per person by 2019. The FCC currently estimates seven devices per household. Multiple users in a single household are also routinely using multiple connections simultaneously, and this too must also be accounted for because it is just such realities that are driving "tremendous consumer demand for broadband".

Software downloads, OS updates and the IoT

51. Growing demands on network capacity that may require bandwidth more than 5 Mbps include software downloads, operating system updates and other data-intensive updates required by Windows and OS X operating systems. The shift to the "cloud" and rapid expansion of the "Internet of Things" into businesses and the home are also driving internet traffic growth.

Data caps and Speed Limits

52. In the Canadian broadband market, residential plans are primarily differentiated by speed and data caps: lower-speed tiers correspond to lower prices, and with lower monthly data caps than more expensive, faster plans, as we observed in our original submission (paras 85-98). When considering which applications can be supported by 5 Mbps service tiers as compared to those at a higher level of service, data caps are also a critically important factor.
53. This is a fact that is recognized by most ISPs in Canada. For instance, Telus recommends that its 6 Mbps service tier is intended only to support a limited functionality, while its next lowest service tier (25 Mbps) can support

a much wider range of applications. Telus even recommends that, in order to fully enjoy the use of online activities such as online gaming, frequent downloading of large files (e.g. software updates, digital game or software downloads), video streaming or to support multiple uses and devices at the same, customers should subscribe to its 50 or 100 Mbps service tiers.

54. So while a 5Mbps service might be technically capable of supporting a single HD video stream, what people in the real world will quickly find is that the data caps associated with these lower-tier plans prevent them from fully enjoying the services they pay for.
55. There are many problems associated with data caps. They are an excessively blunt and artificial constraint that discourages communication and broadband internet use when the goal of public policy should be to encourage it. To the extent that network congestion is a problem, it stems from peak traffic loads, not from the individual use patterns of so-called bandwidth hogs.
56. From an economic point of view, there is no link between charges and costs, with so-called excess usage charges per GB vastly outstripping the cost to produce a GB, which is already vanishingly small or approaching zero, if not already there. The use of data caps also puts an unregulated pricing tool in the hands of ISPs with market power.
57. Research also shows that, far from being willing to pay or feeling in control, people are confused by data caps, and fearing the financial blows of being online “too much,” are discouraged from using the Internet as much as they otherwise might. This works against the adoption of new services and undermines online security by discouraging people from updating software - - the major cause of Internet security issues. They are also disproportionately hurtful to low-income and minority populations.
58. The great majority of OECD countries shun caps in whole or in part, while Canada, in contrast, ranks fourth behind New Zealand, Iceland and Australia in the prevalence of explicit caps. Insofar that data caps can be justified, Sandvine imagines a scenario where users are allocated 200GB caps per month for use during *peak periods*, and unlimited use thereafter.
59. In short, any conception of a “basic service” must take a broad view of the standards that Canadians require to fully enjoy the Internet, and such a view requires consideration of data caps, not just of throughput/speed.

Recommendations

60. Based on the evidence, analysis and arguments that we have presented over the course of this proceeding, we provide the Commission with the following six recommendations:
- i. The Commission has the authority to bring in substantial BSO reform. It must use this power.
 - ii. We strongly encourage the Commission to expand universal basic service to include, at a minimum, access to affordable, high-speed broadband of between 25 and 30 Mbps by 2021. This standard is grounded in (a) how Canadians use the internet, (b) reasonable projections of growth and (c) the modest end of international standards being pursued in the US, Australia and 28 EU countries, although well below the more ambitious targets for speed *and* adoption in the latter countries and New Zealand (Australia's target of 50 Mbps to 90% of homes is an *access* target only).
 - iii. We strongly urge the Commission to push for the phase out data caps, or at least to put a floor associated with basic broadband of around 200 GB per month for households and 90-100 GB for individual subscribers based on projected use of "average Canadians" in 2020 (Cisco). Another option might be to adopt 200 GB caps per month during *peak* use, and *unlimited* use thereafter (Sandvine). As a general principle, broadband service should be differentiated by speed, customer service, price and other factors, not use. Unlimited usage at different levels of speed and price points should be as much a part of a universal service for broadband as it was for POTS.
 - iv. We also strongly urge the Commission to move beyond its focus on access and geography in its own research, monitoring and reporting to give greater weight to adoption and affordability and how people use broadband internet. Simply put, more comprehensive and better methods generally are needed to monitor the services covered by the BSO.
 - v. As revenues from POTS declines, the Commission should expand the range of services that contribute to the National Contribution Fund to include retail Internet access revenues. It might also encourage and work with the federal government to bring the amount of broadband subsidies closer to trends amongst Canada's peers. In an age where content is king, connectivity might be emperor; subsidies should better reflect this reality.
 - vi. Lastly, we encourage the Commission to work with Innovations, Science and Economic Development and the federal government to develop a more coherent policy agenda so that they do not work at cross-purposes.

-- End --