

Prepared remarks before the Canadian Radio-television and Telecommunications Commission (CRTC).

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1. Good morning and thank you very much for inviting us to this hearing.
2. My name is Reza Rajabiun and I am a researcher with the Communication Technologies in the Information Society Research Group at the Ted Rogers School of Information Technology Management, Ryerson University.
3. Unfortunately, my colleague Prof. Middleton could not be here today; she is in Australia working on broadband policy issues there and send her regrets. I would like to apologize in advance since I also have prior commitments abroad and will not be able to appear before you for the response phase of this proceeding next week.
4. Our submission draws on a number of research projects we have completed over the past few years that evaluate the relationship between the design of public policy and the development of broadband network infrastructure, both in Canada and internationally. Studies that inform our comments have been published in peer-reviewed journals and are cited in our written submission.
5. We are particularly pleased to hear the Chair has recently reiterated the Commission's commitment to ensuring "Canadians have access to a world-class communication system".<sup>1</sup> This approach to defining CRTC's policy objectives provides a basis for empirically based debate and decision making regarding particular policy instruments, including wholesale access obligations.
6. Our reading of interventions by other parties suggests that in the next two weeks you are going to be confronted with a great deal of contradictory evidence about the state of the Canadian communications system, some of it bordering on hyperbole. Certain parties have submitted very long and detailed interventions arguing there is already substantial retail market competition, Canadians have access to the best/fastest networks, and that attempts by the Commission to extend wholesale obligations to fibre-to-the-premises (FTTP) access and fibre-to-the-node (FTTN) transport facilities will force them to reduce their capital expenditures on the broadband networks Canadians demand. These parties tend to argue the "public interest" will be served best either by continuing the regulatory framework formalized in Telecom Decision 2008-17 or going even further by reducing the scope of the regulations (i.e. replicate the U.S. policy model of forbearance). Given that these parties tend to dominate the fixed and mobile markets, we submit considering and accounting for threats of reduced investment by large incumbents should be an integral element of any attempt to reconfigure the wholesale regime already in place.

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<sup>1</sup> Speech by Jean-Pierre Blais to the Vancouver Board of Trade Vancouver, British Columbia November 6, 2014. Retrieved from <http://news.gc.ca/web/article-en.do?nid=900869>

7. Others will offer a more critical reading of the evidence about the competitive landscape, pointing to international data documenting that retail and wholesale access prices in Canada tend to be relatively high and average service quality levels are low. This more diverse group includes consumer and business advocacy organizations, content and application providers, lower levels of government and public entities are urging the CRTC to do something about the state of the retail markets by reforming the wholesale regulatory framework. They also offer a wide range of proposals for the Commission to consider, including functional or structural separation, equivalence of inputs as in the EU, access to transport/backhaul facilities, reducing regulated rates to essential facilities, and so on.
8. Our research suggests that reality lies somewhere in the middle of these contradictory perspectives. In case the Commission determines that adjustments to the Telecom Decision 2008-17 framework are required to ensure Canadians have access to a “world-class” infrastructure, we offer an approach to reforming the wholesale regime that aims to enhance the pace of progress in network improvements in a technologically and competitively neutral manner, while minimizing interference with market forces as mandated under the 2006 Policy Direction.
9. Consider the policy dilemma you are facing in this matter as an empirical puzzle:
10. A) The CRTC has long emphasized investment incentives for copper/DSL and cable broadband operators in its decision making, a strategy that appears to have been relatively successful in promoting overall capital expenditures in telecoms. According to ITU data, at least since the collapse of the telecom bubble in the early 2000s telecom capital expenditure levels in Canada have been higher than the average among high-income countries. More recent CRTC data and disclosures from operators in the course of this proceeding indicate capital expenditures growth in fixed networks has remained strong.
11. B) Despite relatively high investment levels, at least since the Telecommunications Policy Review Panel (TPRP)’s final report in 2006 federal policymakers have recognized that Canada is beginning to lag behind other advanced countries. The TPRP noticed Canada’s comparative decline in broadband penetration rankings. Industry Canada’s 2010 Digital Strategy Consultation paper identified the problem in terms of broadband service quality in Canada, highlighting that “Canada ranks in the middle of the pack in average or median real-world download speeds according to sources such as Akamai and Speedtest.” More recent data from these and other network performance test beds document the situation has not changed very much since Industry Canada’s characterization back in 2010. Broadband network performance in terms of download speeds in Canada remains about average relative to other advanced economies. If average/mediocre is considered good enough and the Commission determines that, to paraphrase the Chair, the “sky is not falling”, then retaining status quo regulatory arrangements might appear to be a viable option.
12. However, comparative international rankings commonly cited in these debates hide a number of important facts about the state of Canada’s broadband infrastructure. In terms of the magnitude of the performance gap, service quality levels/speeds end users in Canada can achieve are about 2 to 3 times lower/slower (depending on the testing methodology) than in a number of leading countries in Europe and Asia. Furthermore, the magnitude of the gap with the leading cluster is substantially larger in terms of upload speeds (around 5-7 times lower/slower in Canada). The particularly asymmetric nature of Canadian broadband services represents an important impediment to the adoption of various personal, business and public service applications requiring reliable symmetric connectivity speeds, for instance cloud services, e-health, e-learning , emergency services and so on.

13. From a long term perspective, it is worrying that the diffusion of FTTP networks in Canada remains negligible (around 3 % of total connections, which is 5 times lower than the OECD average and less than half of the U.S. figure, OECD broadband data<sup>2</sup>). The lack of access to high-capacity fibre connections is not only a problem for individuals and businesses that demand content and application services, but also forces high demand end users to remain on legacy DSL and cable networks, exacerbating congestion on local links and routers that degrade quality of experience for others in the vicinity.
14. Despite the fact that the CRTC clearly signalled its commitment to forebear from regulating wholesale access to fibre access networks under Telecom Decision 2008-17, disincentives to allocate capital from legacy platforms to the deployment of advanced FTTP networks apparently remain strong. Today, six years later, high-speed and symmetric fibre connections remain largely unavailable to Canadian households and businesses, even in relatively densely populated urban areas where the costs of deploying fixed network assets are relatively low. The Canadian experience contradicts the argument that forbearance from imposing essential facilities obligations will foster investment and the diffusion of next generation networks.
15. To identify which policy strategies and business models are more or less conducive to promoting private sector incentives to supply Internet access services, we have studied the evolution of Internet connectivity using broadband speed measurements within Canada and internationally. The Canadian experience offers a number of important insights worth considering:
16. Due to differences in the relative costs of upgrading network capacity and deploying new technologies, the Commission's decisions about the design of wholesale access to old and new platforms have different implications for the supply of Internet access services in rural and urban areas. In relatively densely populated urban settings, it might be feasible and economically justifiable for multiple platforms to coexist. As the costs of deploying networks increase with lower population densities and challenging geographical obstacles, policies that promote platform competition become less efficient and those that promote cooperation become even more imperative.
17. Lack of effective essential facilities obligations to interconnect third parties to local access, switching and backhaul facilities at the Federal level represents an expensive impediment to the ability of lower levels of government to address market failures. For example, to induce essential facilities operators to maintain open access points and transport facilities, Alberta and British Columbia have had to resort to compensating backbone providers with expensive procurement guarantees, invest directly in an open access backbone (e.g. AB, various municipalities), and other have had to directly subsidize the incumbents to open their local switching and transport facilities (e.g. Eastern Ontario Regional Network, EORN). While costly for lower levels of government, our research documents that provinces with policies that encouraged open access to transport facilities have developed relatively higher quality broadband networks.
18. We submit that Federal wholesale access regulations that promote cooperation and risk sharing can reduce the costs facing sub-national governments trying to address market failures and promote adoption of advanced platforms. Lessons from the provincial and rural broadband experience are particularly important because under Canada's Federalist Constitution it is the provinces and

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<sup>2</sup> Note that our original submission used June 2013 data, these data are from December 2013. In terms of ranked position in the OECD, the % of fiber among Canada's broadband subscriptions ranked 24th in the OECD in June 2013, improving slightly to 22nd in the OECD by December 2013.

municipalities that are ultimately responsible for delivering social and business infrastructure that attracts people, capital, and sustainable economic development.

19. Inspired by the puzzling dissonance between investment inputs and broadband network outcomes in Canada, we have also looked at the relationship between regulation, investment, and the development of broadband connectivity in the EU. Our research confirms the results of some of the studies you will be hearing about in the next week, documenting a negative correlation between the intensity/density of regulatory obligations and aggregate capital expenditure levels. However, we do not find a statistically significant link between capital input levels and differences in broadband network quality. Moreover, we find that countries with regulatory regimes that were more effective in promoting service based competition have developed relatively higher quality networks and are further along the path in the transition from 1<sup>st</sup> generation broadband to next generation FTTP networks. In other words, relatively clear and predictable access obligations appear to increase the pace of creative destruction from sunset to sunrise platforms.
20. We do not contend a technologically and competitively neutral essential facilities regime will by itself reverse noted empirical trends about broadband quality and technological change in Canada. In the very long term operators of legacy platform will extend fibre links closer to end users as old technologies are decommissioned. Nevertheless, without a substantive shift in the incentive structure of the industry we do not believe Canada is going to catch up with the leading cluster of advanced economies in terms of average connection quality and fibre diffusion anytime soon.
21. In case the Commission determines that the pace of progress in network capacity/quality improvements and diffusion of next generation platform is not sufficient, then we offer a number of proposals for reforming wholesale market rules that might help achieve these objective:
22. A) To promote cooperation and risk sharing, reduce inefficient duplication, and to comply with the technological and competitive neutrality mandate of the 2006 Policy Direction, the Commission has the option to extend the scope of wholesale access obligations to fibre transport facilities and hypothetical FTTP access networks of the future.
23. B) To limit the threat of under-investment and promote incentives to channel capital expenditures into next generation networks, the Commission could then adopt a relatively high-mark-up level for regulated access to advanced platforms relative to those on legacy DSL and cable platforms. This might induce some operators to increase the pace of their transition to fibre, and if they don't allows for other entities to start filling up the gaps. In the very long term as FTTP platforms are deployed and their fixed costs are amortized, the Commission can then gradually reduce the mark-up level to reflect incremental costs.
24. C) By continuing to allow market transactions at prices that vary from the regulated price, as it already does, the Commission will eliminate the likelihood that the new obligations will interfere with the operation of market forces pursuant to the 2006 Policy Direction.
25. Finally, to reduce the costs of compliance for incumbents and regulatory uncertainties about the scope of access to particular classes of facilities, we suggest simplifying and consolidating service category classifications.
26. Thank you and I would be pleased to answer your questions.