

From:
Reza Rajabiun and Catherine Middleton
Ted Rogers School of Information Technology Management
Ryerson University

To:
Janice Charette
Clerk of the Privy Council and Secretary to the Cabinet
Langevin Block
80 Wellington Street
Ottawa, Ontario K1A 0A3

December 21, 2015

Re: Gazette Notice DGTP-002-2015

Petition to the Governor in Council concerning Telecom Regulatory Policy CRTC 2015-326

Dear Ms. Charette,

We welcome the opportunity to submit comments regarding Bell Canada's Petition to the Governor in Council concerning Telecom Regulatory Policy CRTC 2015-326, as per Notice No. DGTP-002-2015. Our comments are informed by our academic research on the development of Canada's broadband infrastructure, and by our participation in the CRTC consultation (CRTC TNC 2013-551) that preceded the development of Telecom Regulatory Policy CRTC 2015-326.

This submission calls for the Governor in Council to review Bell Canada's petition in the context of the complete body of evidence submitted to the CRTC by the wide variety of stakeholders who participated in the 2013-551 consultation. We draw the Governor in Council's attention to salient evidence that counters Bell's assertions in its petition, and also note relevant evidence omitted from the petition. For instance, we challenge Bell's conclusion that investment levels offer an appropriate measure of the development of high quality broadband networks, or that they can be used to establish that Canada is a broadband leader. We also make the case that Bell's threats to refrain from upgrading its networks are not credible in its market environment, and note that if Bell does choose not to invest, the CRTC 2015-326 policy can create a viable environment for other companies to do so.

We are providing these comments as individuals, not as representatives of Ryerson University. The research upon which this submission is based has been funded by the Social Sciences and Humanities Research Council, the Canada Research Chairs program, the GRAND NCE and by Ryerson University.

Please note that the submission includes 4 attachments. Thank you for considering our submission.

Sincerely,

Dr. Reza Rajabiun & Dr. Catherine Middleton

Regarding

Notice No. DGTP-002-2015 — Petition to the Governor in Council concerning Telecom Regulatory Policy CRTC 2015-326

December 21, 2015

Comments by

Dr. Reza Rajabiun, Research Fellow, Ted Rogers School of Information Technology Management, Ryerson University, reza.rajabiun@ryerson.ca

Dr. Catherine Middleton, Professor and Canada Research Chair, Ted Rogers School of Information Technology Management, Ryerson University, catherine.middleton@ryerson.ca

Submitted to:

Clerk of the Privy Council and Secretary to the Cabinet
Langevin Block
80 Wellington Street
Ottawa, Ontario K1A 0A3

CC:

Director General
Telecommunications Policy Branch
Industry Canada
10th Floor
235 Queen Street
Ottawa, Ontario K1A 0H5

Secretary General
CRTC

Distribution list of parties to CRTC 2013-551/CRTC 2015-326

This submission includes 4 separate attachments

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Attachments:

1. Reza Rajabiun and Catherine Middleton. "Public Interest in the Regulation of Competition: Evidence from Wholesale Internet Access Consultations in Canada" *Journal of Information Policy* (2015): 5, 32-55.
2. Reza Rajabiun and Catherine Middleton. "Multilevel governance and broadband infrastructure development: Evidence from Canada" *Telecommunications Policy* (2013): 37.9, 702-714
3. Reza Rajabiun and Catherine Middleton. "Regulation, investment and efficiency in the transition to next generation broadband networks: Evidence from the European Union" *Telematics and Informatics* (2015): 32.2, 230-244.
4. Reza Rajabiun and Catherine Middleton. "Rural Broadband Development in Canada's Provinces: An Overview of Policy Approaches" *Journal of Rural and Community Development* (2013): 8.2, 7-22.

I. Executive summary

- The petitioner, Bell, claims that the CRTC's 2015-326 decision to extend wholesale access obligations to include fiber-to-the-premises (FTTP) will inevitably reduce investments in next generation fibre networks Canadians demand. This submission draws the Governor in Council's attention to evidence submitted to the CRTC 2013-551 proceeding, countering Bell's claims and suggesting instead that the decision can incentivise operators to accelerate their FTTP deployments. The announcements by a number of dominant operators pursuant to the CRTC 2015-326 decision to start deploying FTTP in low cost urban centres illustrate that the decision is already having a positive impact on FTTP deployment incentives.
- Bell argues that the Commission disregarded certain evidence and was somehow unfair to Bell's interests in reforming Canada's wholesale access regulatory framework per CRTC 2015-326. But as the record of the public consultation process that led to the decision demonstrates, there is little new information presented in Bell's petition. However, the Governor in Council should be aware that Bell's petition to vary the decision disregards key metrics that informed the Commission's decision to adopt a technologically and competitively neutral approach to the design of wholesale access obligations.
- Bell argues that the CRTC should not impose old regulations on new technologies but we note that CRTC 2015-326 creates incentives for operators to accelerate their FTTP investments and to make these networks available on a wholesale basis (thus eliminating duplication of network infrastructure by enabling service-based competition). As such, the decision is designed to encourage further development of the next generation broadband networks needed to ensure Canada's future prosperity, and is in the public interest.
- Bell argues that it might stop investing in fibre networks if CRTC 2015-326 is not altered according to its demands. However, Bell's petition does not recognize that investment inputs alone do not guarantee better outcomes nor does it acknowledge that despite high levels of investment in recent years, Canada is no longer a broadband leader. Despite relatively high prices and aggregated capital expenditure levels in telecoms, the actual speed of connectivity Canadians receive from their service providers are about average and there has been limited FTTP deployment outside of Atlantic Canada. The petitioner is disregarding important evidence on the record, while criticizing the Commission's decision and questioning the integrity of the process that led to CRTC 2015-326. Although the outcome of the consultation did not meet the petitioner's expectations, this outcome doesn't support Bell's assertions that the public consultation process somehow led to an "unfair" outcome.

- The petitioner provides some evidence that purportedly illustrates there are no problems with broadband markets in North America where regulators have been exercising forbearance on FTTP. The petitioner claims that in contrast with North America, in markets in Europe and elsewhere where policymakers have adopted open access rules on next generation networks, broadband development has fallen behind. Research we have published in peer-reviewed journals on Canada and EU members contradicts these assertions by the petitioner.
- The Canadian experience over the past decade suggests that broad strategic decisions by large operators such as Bell have impacted their investment in fibre, not regulation. The Commission has had a clear policy of forbearance from mandating access on fibre access facilities since 2008. There is little doubt that this policy has been ineffective in promoting investment in advanced FTTP platforms as operators have targeted capital expenditures primarily to upgrading legacy copper and cable networks. FTTP connections make up less than 5% of broadband services in Canada and have been growing very incrementally over the past few years, a trend the disaggregated and technologically neutral approach to wholesale Internet access regulation in CRTC 2015-326 may help reverse. The impact of the new regulatory framework will depend on its implementation details, which are currently under consideration as part of a follow up proceeding at the CRTC.
- The specific variation requested by Bell to the CRTC 2015-326 framework (i.e. to exclude fibre and DOCSIS 3.1 from the application of the rules) will effectively nullify the intent and effect of the CRTC decision. Such a variation would ensure regulatory asymmetries distorting market competition under the current regime will continue, providing copper/DSL operators such as Bell and Telus with a competitive advantage over cable companies. Bell's requested variation would also ensure that service-based competitors would be relegated to reselling low speed/low margin services to households and businesses, further reducing competitive discipline on incumbents and leading to higher prices for the higher quality/speed connections Canadians demand.
- Contrary to Bell's claims, CRTC 2015-326 sets out a regulatory model that has the potential to accelerate the pace of FTTP deployment in Canada, particularly in urban centres. Evidence of the development of broadband in Canada and internationally, as well as positive reactions by a number of large incumbents to the regulatory reforms in CRTC 2015-326 lend support to this hypothesis. The lack of essential facilities obligations on transport facilities under the new "disaggregated" wholesale regime however will continue to limit the scope for improving broadband connectivity and FTTP deployment in relatively higher cost suburban and rural communities.

II. Background and evidence

1. **This intervention:** We are researchers interested in better understanding which public policy models and business strategies enhance the prospects for the development of Internet access infrastructure, in Canada and internationally. Over the past decade we have conducted a wide range of studies that evaluate the development of supply and use of broadband connectivity, a number of which relate directly to issues that were outlined in the CRTC 2013-551 consultation notice. We participated in the proceedings, presented the results of our research, and suggested a “glide path” model for mandated access to broadband infrastructure that promotes incentives of operators to invest in FTTP while providing some scope for service-based competition in the medium to long term.¹ Our peer-reviewed research publications underlying our original interventions in CRTC 2013-551 contradict key evidence and core arguments submitted by the petitioner in this matter in order to forestall the implementation of a regulatory bargain achieved following a multi-year consultation process. Our comments here, as well as our attached research articles, aim to provide the Governor in Council with a broader perspective on the evidence that informed the CRTC 2015-326 decision and explain why it would be in the interest of Canadians to dismiss this petition.
2. **Historical context of the decision on appeal:** In the late 1990s and early 2000s Canada was recognized as a leader among advanced economies in deploying high-speed “broadband” networks (as opposed to dial-up connectivity), with comparatively high penetration rates for broadband services delivered on legacy copper telephone and cable TV networks.² Since at least the mid 2000s however federal policymakers have recognized concerns about Canada’s comparative decline as a broadband leader.³ Responding to these concerns, the previous government’s 2006 Policy Direction directed the Canadian Radio-Television and Telecommunication Commission (CRTC) to implement competitively and technologically neutral regulations that rely on market forces to the maximum extent possible to promote the development of Canada’s telecommunications infrastructure.⁴ In CRTC Telecom Decision 2008-17 the Commission interpreted this direction to extend wholesale access obligations to operators of cable broadband networks, but determined that to promote investment in next generation fibre access and transport facilities it would forbear from obliging operators of such facilities to provide third parties (e.g. other service providers, municipalities, public institutions) with wholesale access services. The CRTC’s 2015-326 decision, the subject of Bell’s petition to the Governor in Council (GIC), reverses the position taken in 2008-17 that excluded fibre access networks from wholesale access obligations, with incumbent operators now required to provide wholesale high-speed access to their next-generation fibre networks.

¹ See paragraphs 5 and 24 of final submission by Reza Rajabiun and Catherine Middleton to CRTC 2013-551 proceedings: Available at: <http://crtc.gc.ca/eng/archive/2013/2013-551.htm>

² See OECD Broadband Portal for historical data on broadband penetration. Available at: <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm> (Table 1.5).

³ See e.g. Telecommunications Policy Review Panel (2006). *Final Report*. Government of Canada. Retrieved from [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/tprr-final-report-2006.pdf/\\$FILE/tprr-final-report-2006.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/tprr-final-report-2006.pdf/$FILE/tprr-final-report-2006.pdf)

⁴ *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives*, P.C. 2006-1534, 14 December 2006.

3. **Evidentiary basis for the CRTC 2015-326 decision:** Over the past decade, Canada’s comparative decline as a broadband leader has been evident in two key indicators used to assess relatively mature broadband markets, namely the actual upload and download speeds end users experience (as shown in Figure 1) and the pace of transition from legacy copper (DSL) and cable technologies to next generation fiber-to-the-premises (FTTP).

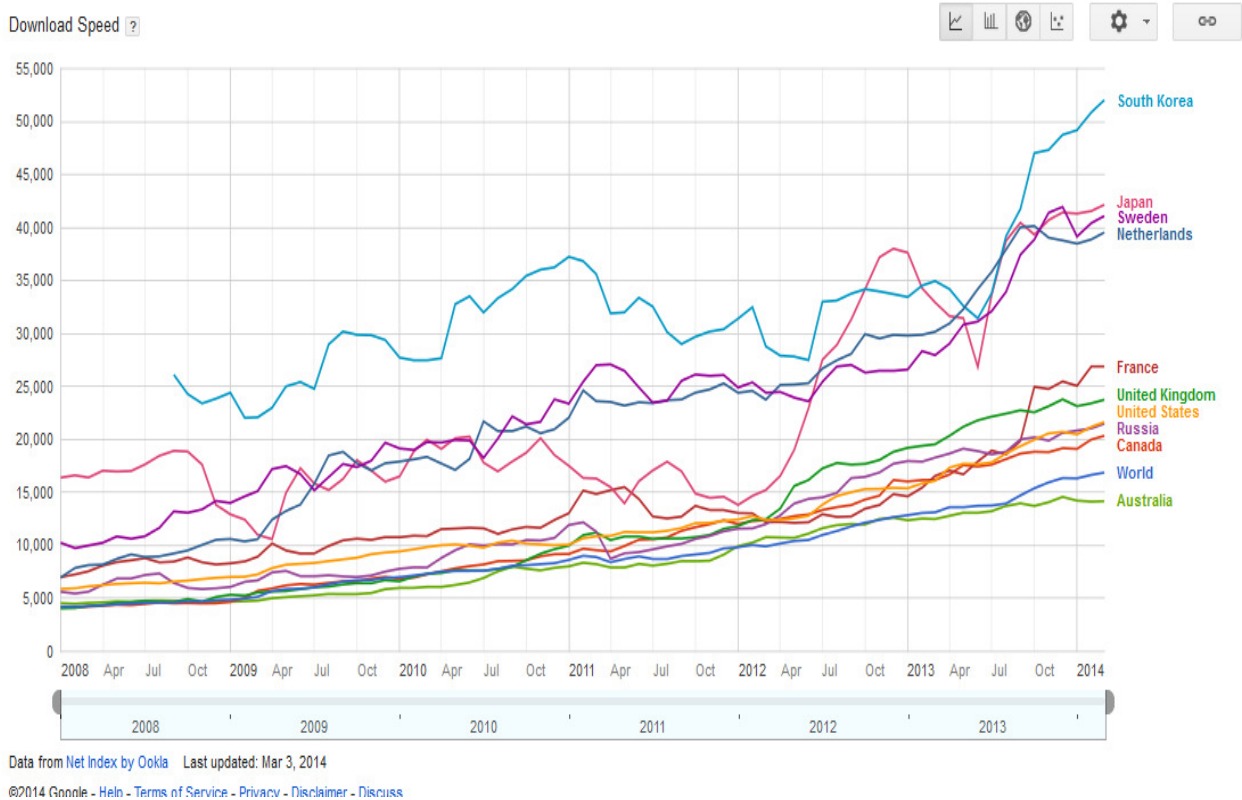


Figure 1. Divergence of Broadband Network Speeds in Selected High Income Countries (Please note this graph was presented as part of our final submission to CRTC 2013-551. More recent data from the same data vendor are no longer publicly available. For more recent data on actual connectivity speeds across high income countries see OECD Broadband Statistics, Table 5.5.)

During the CRTC 2013-551 proceedings that ultimately led to the CRTC 2015-326 decision now before both the CRTC and the GIC on appeal by Bell, various parties (including us) submitted substantive evidence documenting growing concerns about the quality of fixed Internet access services available to residential and business users in Canada. Evidence that the 2008-17 policy framework had not fully enabled the development of world class broadband infrastructure Canadians demand represents one important justification for the CRTC 2015-326 decision that is now before you on appeal. While copper and cable broadband are widely available and adoption rates are high, the fact that Canada’s FTTP penetration rates remain low (below 5%, or about

half of the US rate and a third of the OECD average, as shown in Table 1)⁵ clearly demonstrates that forbearance from mandated access per 2008-17 has been largely unsuccessful in promoting operators to invest in advanced FTTP platforms and to encourage customers to take up next generation broadband services. The CRTC 2015-326 decision represents an attempt to implement a regulatory framework that increases operators’ incentives to invest in advanced next generation broadband technologies Canadians demand, while earning a reasonable rate of return on their investments.

Table 1: FTTP Penetration Rates	
Canada	5%
U.S.	9%
OECD average	17%
Top 10 OECD	36%
Source: OECD broadband statistics, Table 1.10, December 2014.	

4. **Evidentiary basis for this appeal:** Bell Canada, the petitioner has submitted a large volume of data and research in this appeal to the GIC. Bell has also submitted another set of appeals to the CRTC (in which it asks the Commission to restrict the range of parties that can access network facilities the Commission has already found are essential, and therefore subject to third party wholesale access obligations). While the 30 day deadline on comments to the petitioner’s appeal does not permit us to provide a detailed evaluation of the evidence submitted by the petitioner, it is imperative that the GIC recognize that key facts about Canada’s comparative decline as a broadband leader, in terms of service quality/speeds and the limited incentives of legacy DSL and cable network operators to deploy next generation FTTP under the 2008-17 policy, are missing from the petitioner’s analysis. Consequently, the petition by Bell is misleading in its characterization of the evidence underlying the Commission’s decision in CRTC 2015-326.

5. Further, although we argue that measures of broadband leadership should be defined broadly, it is important to note that Bell’s use of broadband penetration data in Figure E2 to demonstrate Canada’s leadership is misleading as it excludes relevant data. Figure E2 is accurate in that Canada’s broadband penetration is higher than that in US and in the OECD, but as shown in Figure 2 below (created using the same data source and updated to include December 2014 data from the OECD on Historical (Fixed) Broadband Penetration Rates),⁶ Canada’s penetration lags many European countries. Figure 2 (best viewed in colour) shows the 10 leading OECD countries in 2014, as well as Canada, the US and the OECD average, presenting a very different picture than that shown in Figure E2 in the petition, as E2 only

⁵ OECD Broadband Portal, Table 1.10, December 2014. Available at: <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm>

⁶ OECD Broadband Portal, Table 1.5.1, <http://www.oecd.org/sti/broadband/1.5-BBPenetrationHistorical-Data-2014-126.xls>

shows Canada, the United States and the OECD. The raw data for June 2014 (as presented by Bell) and December 2014 is provided in Table 2.

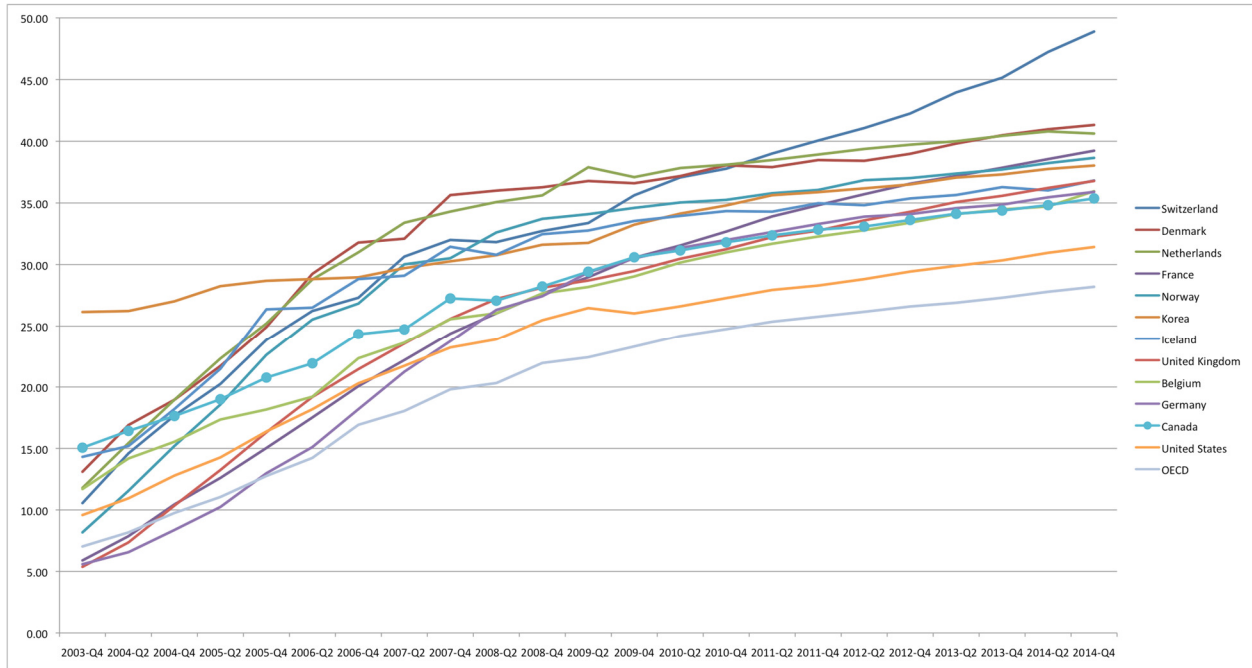


Figure 2: OECD historical fixed broadband penetration rates – Subscriptions per 100 inhabitants.
 Source: OECD Table 1.5.1. <http://www.oecd.org/sti/broadband/1.5-BBPenetrationHistorical-Data-2014-126.xls>

Table 2: OECD historical fixed broadband penetration rates (subscriptions per 100 inhabitants)		
	2014-Q2	2014-Q4
Switzerland	47.24	48.89
Denmark	40.97	41.32
Netherlands	40.80	40.63
France	38.56	39.24
Norway	38.23	38.65
Korea	37.76	38.03
Iceland	36.02	36.82
United Kingdom	36.22	36.78
Belgium	34.71	35.95
Germany	35.46	35.90
Canada	34.83	35.37
United States	30.96	31.43
OECD	27.80	28.20
Source: OECD Table 1.5.1 http://www.oecd.org/sti/broadband/1.5-BBPenetrationHistorical-Data-2014-126.xls		

Further, as shown in Table 3, Canada’s comparative position has fallen in the past decade, as European countries have taken the lead in broadband penetration.

Table 3: Historical ranking of fixed broadband penetration rates							
(ranked using OECD data on subscriptions per 100 inhabitants, Q4 data for each year shown, 1 is the top rank)							
	2003	2005	2007	2009	2011	2013	2014
Switzerland	9	5	3	3	1	1	1
Denmark	4	4	1	2	3	2	2
Netherlands	5	3	2	1	2	3	3
France	14	14	13	10	7	4	4
Norway	12	6	6	5	4	5	5
Korea	1	1	7	7	5	6	6
Iceland	3	2	4	6	6	7	7
UK	16	13	11	12	11	8	8
Belgium	6	10	12	14	12	10	9
Germany	15	18	14	11	8	9	10
Canada	2	9	9	9	10	11	11
United States	10	12	15	15	15	16	16

Source: OECD Table 1.5.1,
<http://www.oecd.org/sti/broadband/1.5-BBPenetrationHistorical-Data-2014-126.xls>

6. **Market responses to the 2015-326 decision:** Arguments before the Commission that a technologically neutral approach to wholesale access regulation encourages operators to increase their investments in next generation fibre networks are being validated as Canadian operators recognize the opportunity presented by the CRTC 2015-326 decision and announce their intentions to invest in a number of large scale fibre deployment projects.⁷ The new regulatory framework also appears to be attracting foreign investors into the Canadian telecom market.⁸ Consequently, the Commission’s adjustments to the wholesale framework appear to be promoting investment and competition in the provision of services Canadians demand, not inhibiting market forces as the petitioner has argued.

⁷ Bell Gigabit Fibe internet service launched in Ontario, Quebec, CBC News, August 5 2015. Available at: <http://www.cbc.ca/news/technology/bell-gigabit-fibe-internet-service-launched-in-ontario-quebec-1.3187499>

Rogers announces Ignite Gigabit internet, 4K sports broadcasts, CBC News, Oct 5, 2015. Available at: <http://www.cbc.ca/news/business/rogers-internet-1.3256745>

Telus boosts Vancouver's internet network with \$1B upgrade, CBC News, Oct 2, 2015. Available at: <http://www.cbc.ca/news/canada/british-columbia/telus-upgrade-vancouver-1.3254403>

⁸ MTS strikes \$465-million deal to sell Allstream unit to Zayo Group of U.S. The Globe and Mail, Nov 25 2015. Available at: <http://www.theglobeandmail.com/report-on-business/manitoba-telecom-strikes-465-million-deal-to-sell-allstream-to-us-group/article27436124/>

7. **Risks in implementing the 2015-326 decision:** Despite some market signals about the positive impact of CRTC 2015-326 on investment and competition incentives in the provision of next generation Internet access infrastructure, considerable risks remain because the CRTC has not yet determined key technical configurations and pricing parameters for the new regime. These issues are currently under debate in the CRTC 2015-326 follow up proceedings and in a number of other requests for the Commission to review and vary the decision. If the Commission ultimately chooses technical configurations for its new disaggregated wholesale model that are too costly and complex to implement, or sets a regulated wholesale price for next generation FTTP networks that is too low, incentives for both incumbents and potential entrants to invest in Canada's broadband infrastructure are likely to remain limited. On the other hand, if the Commission adopts an efficient wholesale access interconnection model and sets a higher mark-up level for future third party access to fibre networks relative to today's legacy networks (i.e. higher than the current cost plus 15% on legacy copper/DSL and cable networks), then there is no reason to suspect that CRTC 2015-326 will reduce investments required to increase the pace of the transition from legacy to next generation platforms. If the regulated price set by CRTC is too high however, it can become a barrier to competition and create incentives for inefficient duplication of fibre access network infrastructure, which is why it would be optimal for the Commission to start with a relatively attractive mark-up on costs to promote FTTP deployments and then reduce this rate gradually as fibre networks become more widespread across the country in the next decade or two. We therefore recommend the GIC and Innovation, Science and Economic Development Canada keep a close eye on the CRTC 2015-326 follow up implementation process and other simultaneous appeals by the petitioner relating to the new regulatory strategy adopted by the Commission.

III. CRTC 2013-551 process integrity, diversity of opinions and changing the status quo

8. **Action to ensure Canadians realize the benefits of better broadband:** At the start of its petition, the petitioner argues that “Canada's future prosperity depends on being a world leader in broadband. The best modern broadband networks will be critical 21st century infrastructure, supporting a thriving digital, information and knowledge economy creating well-paid, highly skilled jobs and providing Canadians in urban and rural areas with access to new technologies like 4K television, ultra high-speed video streaming from Canadian services CraveTV and Shomi and United States based Netflix, and next-generation distance learning, telehealth and other innovative online learning tools for years to come.”⁹ Having participated in the proceedings that led to CRTC 2015-326, we are confident that all the parties and the Commission would agree with the petitioners’ sentiment that Canadians need better broadband to benefit from the full range of social and economic possibilities it would support. What is not clear from the petition is why it would not be beneficial for Canadians to revise a regulatory model that has not been that successful in delivering “world class” speeds to end users or to incentivise FTTP deployments. If what the petitioner calls “Canada’s longstanding policy of facilities-based competition” is not working very well, the Commission indeed has a legal obligation under Section 7 of the *Telecommunications Act* to review and adjust the regulations it applies to the industry.
9. **Procedural integrity:** This petition creates the misleading impression that the Commission acted in an arbitrary and capricious manner in arriving at the CRTC 2015-326 decision. For example, the petitioner characterises the Commission’s decision as “surprising”,¹⁰ stating that the decision “unfairly changes the rules”,¹¹ and “disregards the evidence on the record indicating that mandated access would stall investment”.¹² Because operators such as Bell had devoted so many resources to convincing the CRTC that it should phase out existing obligations or forbear from extending them to fibre access and transport facilities, we were also somewhat surprised that the Commission decided to reconsider the decision it had made 7 years ago in CRTC 2008-17 excluding fibre access from the scope of essential facilities obligations. The petitioner neglects to mention that it achieved an important victory when the Commission chose not to extend mandated access to fibre transport facilities in CRTC 2015-326, a decision that is likely to restrict the ability of rural and suburban communities to deploy their own fibre networks. By moving towards a more disaggregated regime such as the one cable companies had proposed years ago, the Commission did not “disregard” credible evidence submitted by operators into the record, but in fact evaluated the large volumes of evidence provided by them over a two-year consultation process in which the parties had substantive opportunity to make their case and challenge evidence placed on the record by the other parties. During the proceeding the petitioner did not manage to successfully challenge the evidence that other parties, including us, submitted into the record that was contradictory to the evidence the petitioner and its experts had submitted. Although the Commission determined some evidence before it was more credible than other evidence,

⁹ Bell petition, paragraph E1.

¹⁰ Bell petition, paragraph E3.

¹¹ Bell petition, paragraph 6.

¹² Bell petition, paragraph 21

we believe there is no reason for the petitioner to argue that the evidence it presented was unfairly disregarded by the regulatory agency.

10. **Inconvenient truths:** The claim by the petitioner that the Commission disregarded certain unequivocal evidence is particularly interesting because its petition totally ignores well documented concerns about Canada’s average broadband performance in terms of connectivity speeds (Figure 1 above) and about the limited incentives for operators to make substantive investments needed to accelerate FTTP deployments required to catch up with other high income countries (Table 1 above). We submit that beyond Bell’s announcement and then subsequent threat of withdrawal relating to its proposed FTTP deployments in Toronto, there is little fundamentally new in its evidence and arguments submitted to justify its request to “vary” CRTC 2015-326. The variance requested by the petitioner would essentially nullify the new regulatory regime, the implementation of which is currently subject to ongoing proceedings at the CRTC.
11. **Diversity of opinions and the regulatory bargain:** In addition to simply ignoring, rather than challenging, evidence and expert opinion on the record that contradict the petitioners’ claims, the petition creates the impression that the CRTC decision goes against industry consensus. This impression is incorrect. While we agree that most incumbent legacy copper/DSL and cable operators, both large and small, opposed moving to a technologically and competitive neutral regulatory open access regime at the start of the CRTC 2013-551 proceedings, some of them have started to recognize that, as long as the regulated mark-up on essential facilities access is sufficiently high, they would support a regulatory regime that does not arbitrarily exclude/include a sub-set of technologies or operators. While we have no information on the position cable companies will take with respect to this petition, it is relevant to note that both Rogers and Shaw have opposed the petitioner’s concurrent appeal to the CRTC to review and vary CRTC 2015-326.
12. Other parties to the CRTC process, including service-based competitors, municipalities, and consumer groups that participated in the consultations that led to the decision also had very different opinions about what the Commission should do, most of which the Commission dismissed. For example, CNOC (the Canadian Network Operators Consortium, a group of companies that rely upon wholesale access to serve their customers) suggested the Commission should adopt a so-called Equivalence of Inputs (EoI) approach to regulation where the price and quality of products and services offered to third party service providers by infrastructure operators are “equivalent” to those offered by the operator to its own units. Petitions from around 25,000 Canadians submitted to the record of CRTC 2013-551 by OpenMedia called for some form of vertical, structural or functional separation among network and retail operations of incumbents. Parties concerned about rural connectivity such as Cybera and us highlighted the importance of access to fibre transport facilities for communities that are willing to invest in their own fibre access infrastructure and recommended the Commission extend the scope of the wholesale regime to include fibre transport facilities that aggregate traffic from local communities. These more proactive solutions to Canada’s comparative decline as a broadband leader were strongly opposed by large incumbents such as the petitioner and were ignored or essentially rejected by the Commission. When we recognize the wide range of other options that were presented before

the Commission, it seems clear that it chose a relatively conservative approach as a regulatory bargain among competing interests.

13. **Further evidence:** In order to better understand the position and strategies of parties involved in the CRTC 2013-551 proceeding, we used text analytics software to map the large volume of initial submissions. This work, on the emergence of public interest telecom regulations based on the CRTC 2013-551 consultation documents, was published in the *Journal of Information Policy* (Attachment 1). By illustrating the diversity of opinions the Commission ultimately fashioned into the CRTC 2015-326 regulatory framework, the article offers evidence to contradict claims that the Commission was somehow “unfair” in coming to its decision. Furthermore, the analysis in the article helps explain the emergence of the regulatory bargain underlying the adoption of a technologically and competitively neutral wholesale regime in the decision, a bargain which the petitioner claims does not exist.¹³
14. **Hyperbole versus reality:** The petitioner claims that the CRTC decision will limit its incentives to invest in next generation FTTP networks. It lists various communities as examples of its past and future commitments to deploy FTTP, but does not explain why FTTP deployments across the country have remained low despite the fact that the Commission excluded fibre networks from the scope of the regulatory regime in CRTC 2008-17, a regime it claims does encourage investment in fibre.
15. **Under-investment in FTTP:** Instead of deploying free cash flows from their legacy networks to upgrade to fibre, since the CRTC 2008-17 decision dominant operators in the Canadian market have become more vertically integrated by purchasing a variety of non-telecom assets such as media, entertainment and sports properties, data services, home security, etc. Another key characteristic of the Canadian telecom industry is that large Canadian operators tend to allocate a relatively high portion of their cash flows to paying dividends to their investors (Table 4). Given that increasing fibre deployment will necessarily imply an increase in the capital intensity of an operator and limit its ability to pay dividends, investors expecting large short term returns from copper and cable assets can constrain the ability of individual operators to invest in fibre. For example, shortly after the CRTC 2015-326 decision and signals by operators that they would start to accelerate their fibre deployments in certain urban centres, the petitioner’s largest institutional shareholder (RBC) issued a report warning that “Should the telcos enter a phase of elevated capex intensity, we will have to weigh the incremental growth opportunity but negative FCF [free cash flow] impact against the lower capex risk profile”.¹⁴ In the same report however, RBC recognizes that the decision by the Commission to retain the existing Phase II methodology for calculating the costs in Canada’s cost plus mark-up regulatory regime (rather than adopting the Equivalence of Inputs (EoI) model proposed by CNOC) “should prevent an “unfair” tariff regime from being implemented”.¹⁵

¹³ Bell Petition, paragraph E18 & 49.

¹⁴ RBC Telecom Scenario Report, RBC Capital Markets. August 19, 2015, page 1.

¹⁵ RBC Telecom Scenario Report, RBC Capital Markets. August 19, 2015, page 14.

**Table 4. Telecom Financial Performance and Dividend Strategies:
Canadian v. U.S. incumbents**

Operator	Price-earnings ratio/multiple	Dividend yield %	Dividend as % of Free Cash Flows
BCE	<i>17</i>	<i>4.8</i>	87
Telus	<i>19</i>	<i>3.8</i>	<i>83</i>
Manitoba Tel.	<i>17</i>	<i>4.5</i>	<i>68</i>
AT&T	<i>14</i>	<i>5.5</i>	<i>73</i>
Verizon	<i>14</i>	<i>4.6</i>	62
Rogers	<i>15</i>	<i>4.2</i>	87
Shaw	<i>14</i>	<i>4.4</i>	<i>97</i>
Cogeco	<i>13</i>	<i>2</i>	<i>25</i>
Quebecor	<i>24</i>	<i>.5</i>	9
Comcast	<i>19</i>	<i>1.7</i>	29
Time Warner	<i>25</i>	<i>1.6</i>	<i>40</i>

Source: RBC Telecom Scenario Report, RBC Capital Markets. August 19, 2015, Exhibit 12, page 29

16. **Demand aggregation and retail pricing issues:** Previous research on FTTP deployment projects suggests the critical factor in their commercial success is their capacity to aggregate demand from customers and maximize the number of subscribers.¹⁶ More concretely, when determining the viability of FTTP deployments as a business proposition, initial subscription levels (i.e. market share) are more important than the price an operator can charge retail users. Operators such as the petitioner have been offering services that are based on fiber-to-the-node (FTTN) plus last mile legacy DSL/cable links to end user premises using marketing terms such as “Fibe” and “Optik”. While these marketing terms appeal to customer preferences for the faster, symmetric speeds that fibre can deliver, the use of these terms to sell services based on last mile legacy copper/DSL lines will limit the ability of incumbents to go back to customers and convince them to pay a higher price for an actual FTTP connection to their homes and businesses. Although this marketing strategy may have had some short term benefits for legacy DSL operators by enabling them to better compete with faster/higher quality services cable operators can deliver, it will limit their ability to aggregate demand for higher margin FTTP based products in the future. The fact that broadband prices in Canada are already relatively high by international standards further reduces the ability of incumbent or entrants to charge much of a premium for FTTP compared to services based on legacy copper and cable networks. These marketing strategies and market factors are likely to be more important than the design of public policy in explaining why fibre deployment incentives have remained relatively low even in urban centres of the country, despite the relatively high prices Canadians pay for broadband.
17. **Outlook:** As we pointed out to the Commission during the CRTC 2013-551 proceedings, without innovative public policies and business strategies that promote risk sharing and cooperation to channel more capital expenditures into FTTP, the current low investment/diffusion market equilibrium is likely to continue. Under this scenario Canada will only reach current OECD average fiber penetration rates (of just under 20%) sometime near 2030 (at which point the OECD average would likely be much much higher than the current ~20%). Increasing capital intensity by incumbent legacy network operators, strategic entry by non-incumbents into low cost/high margin markets, and intensification of municipal or provincial projects in higher cost suburban and rural communities will be required for increasing the pace of creative destruction (in which legacy technologies are replaced by next generation fibre) from the current baseline trends. In contrast to Bell, we submit that CRTC 2015-326 provides a framework which can, if implemented using a predictable “glide path” wholesale pricing model, enhance the first mover advantage of incumbents and potential entrants that build the first FTTP network in regional and local markets. The fact that the decision was followed by a set of announcements of renewed commitment to FTTP projects in certain large urban centres lends support to predictions about the impact of adjusting the evidently ineffective forbearance strategy on FTTP under CRTC 2008-17. It is

¹⁶ Felten, B. & Swain, W. (2009). *Fibre to Home: Making that Business Model Work*. Yankee Group. Available at: <http://www.slideshare.net/yankeegroup/fiber-to-the-home-making-that-business-model-work> Domingo, A., Van der Wee, M., Verbrugge, S., & Oliver, M. (2014). Deployment strategies for FTTH networks and their impact on the business case: A comparison of case studies. In *20th ITS Biennial Conference, Rio de Janeiro 2014: The Net and the Internet-Emerging Markets and Policies* (No. 106863). International Telecommunications Society (ITS).

nevertheless important to reiterate that the effectiveness of CRTC 2015-326 in promoting FTTP investments and service-based competition will depend critically on the exact details about technical configurations and relative wholesale mark-up rates between sunset copper/cable platforms and next generation FTTP networks that will replace them over time.

IV. Access regulation, investment and efficiency in the transition to NGNs

18. **Regulated wholesale prices:** More than any policy or regulatory decision, future strategies of the petitioner and other large operators regarding allocation of free cash flows from existing copper/DSL and cable networks will influence the pace of progress in the transition to fibre in the medium to long term. Beyond the strategic and financial decisions noted above, as well as other factors that are beyond the scope of this submission, the future rate of transition to next generation networks is likely to depend on the regulated wholesale prices (and technical configurations) the Commission adopts pursuant to the ongoing follow up consultation on the implementation of CRTC 2015-326. If the Commission adopts a regulated wholesale price that is too low or specifies technical interconnection configurations that are too complex and costly to implement by buyers and sellers in the wholesale access market then the petitioner could be right to argue that the decision will reduce incentives to invest in FTTP networks. The fact that the Commission has yet to make its determination on these issues suggests that this petition is both premature and logically flawed in arguing that CRTC 2015-326 will inevitably reduce investment incentives.
19. **Facts versus interpretation:** The petitioner has submitted a large volume of facts to support its request to “vary” CRTC 2015-326, a request we submit will essentially nullify the decision as an economic policy instrument and dismiss the CRTC 2013-551 consultation process in which a variety of stakeholders participated. We have serious concerns about the selective presentation of facts from the record of CRTC 2013-551 proceeding in this petition, and the failure of the petitioner to acknowledge or directly address evidence that did not support its position. Beyond the missing links in evidence amassed in the petition, the manner in which facts are presented is both logically flawed and misleading.
20. **Investment inputs versus network outcomes:** The crux of the petitioner’s argument is that mandated access regulation will reduce the incentives of operators to invest in the next generation fibre networks Canadians demand.¹⁷ What the petitioner fails to consider is the basic economic fact that investments are an input into the network infrastructure development process, not a measure of market outcomes. While we confirm that aggregate levels of capital expenditures in Canadian telecoms have been higher than average of high income countries since the late 2000s, the puzzling matter about Canada’s comparative decline as a broadband leader over the past decade has been that these relatively high levels of aggregate capital expenditures have not translated into the development of relatively high quality broadband networks and that FTTP deployments remain negligible. Disaggregated firm level data on fixed network capital expenditures would provide insights on this puzzle, but this information is not made publicly available by the operators or the Commission. We have however studied this problem in detail in our 2013 article published in *Telecommunications Policy* (Attachment 2). We have also evaluated the interplay between regulation, investment and efficiency in EU members in a 2015 article published in

¹⁷ This represents some progress over the position of the petitioner and other operators of legacy DSL platforms during the CRTC 2013-551 in which they suggested their failure to invest in advanced FTTP platforms was due to limited consumer demand for better services and/or bad public policy.

Telematics and Informatics (Attachment 3). These empirical studies clearly demonstrate that higher aggregate investment levels do not always translate into higher network performance or encourage diffusion of next generation networks due to efficiency losses from too much duplication or a lack of competitive discipline on incumbents from service-based competitors (a.k.a. “resellers” in the language of the petitioner).

21. **Economic interpretation:** Even though we cannot dig deeper into the problem due to a lack of public data on firm level disaggregated capital allocation decisions in Canada¹⁸, available data indicate that relatively healthy capital flows into telecom infrastructure have been allocated primarily to upgrading legacy DSL and cable networks. Although these incremental upgrades have been vital for improving both advertised and actual speeds Canadians can achieve on congestion prone legacy networks, having upgraded their legacy networks, the operators that dominate the Canadian market have limited incentives to incur the fixed cost associated with deploying FTTP and forgoing free cash flows from legacy platforms they have only recently upgraded. The fact that subsequent to the CRTC 2015-551 decision various large legacy operators announced plans to finally start increasing FTTP deployment rates in low cost urban areas lends further support to our interpretation of the facts the petitioner provided to the Commission at the original hearings and is now reiterating in support of this petition. Indeed, market signals from large operators pursuant to CRTC 2015-326 appear to support our prediction and recommendations in paragraph 34 of our first intervention in CRTC 2013-551 consultation process that:

“...commitment to forbearance on FTTP networks has not been very effective in promoting their diffusion. We suggest to reverse this trend the Commission considers incorporating these emerging technologies into the regulatory framework and setting a relatively high cost plus margin for third party access. Such a policy can accentuate the payoff to being the first mover in deploying high-capacity fibre platforms and minimize the likelihood of inefficient duplication in the long term. Under the current regime incumbent DSL and cable operators are bringing fibre closer to end users. Having more than one competing FTTP platform may help promote competition in the future as legacy infrastructure is decommissioned, but is not necessarily the more efficient organizational arrangement since it implies inefficient duplication and overinvestment. In addition to defining a notional “prize” for whoever decides to take the risk of becoming the FTTP monopolist, a high regulated price and clear third party access obligation can help promote cooperation and risk sharing in fixed capital expenditures required for deploying next generation FTTP networks. For example, such a policy could enhance incentives for joint ventures aimed at deploying a single very high capacity network in a particular local market by incumbents. If they decide not to take

¹⁸ We raised the need to make public the relevant disaggregated capital expenditure data in order to independently verify claims by operators with the Commission, but both the operators and the CRTC continue to maintain that such data should be kept confidential. Given the apparent public policy importance of this issue, we submit there is a clear public interest rationale for disclosure of operators’ disaggregated capital input and internal network performance metrics to allow evaluation of their efficiency in translating capital inputs into consumer value. Investors in these firms should also benefit from data that helps them better understand the efficiency by which managers deliver value on their investments relative to their peers.

the lead, then other types of entities such as potential entrants or municipalities would also have incentives to build FTTP networks which they can then resell at more than a reasonable price. In the very long term (i.e. two to three decades), as FTTP networks become more ubiquitous, end users move away from legacy platforms, and the fixed costs of these platforms are amortized by the operators, the Commission can then start to gradually reduce the mark up on wholesale access to these platforms to reflect more closely incremental costs of operating and upgrading the network.”

22. **Prediction:** As detailed in the previous section, there are a wide range of financial and strategic factors that explain Canada’s comparative decline as a broadband leader as assessed in terms of the actual network quality end users experience and FTTP diffusion rates. Nevertheless, if the Commission adopts a credible and predictable wholesale pricing model and the “first mover” advantage is as strong as we hope, it might be possible to increase the pace of creative destruction from legacy to next generation platforms without a substantive increase in aggregate telecom capital expenditure levels by the industry. The key innovation in CRTC 2015-326 is that it creates incentives for operators to divert more capital from upgrading legacy platforms (and potentially other ventures) and direct more capital to deploying FTTP to relatively low cost urban areas in Quebec and Ontario. Investors in operators that take the risk of becoming the first mover in deploying FTTP are likely to gain from the new regulatory regime, while those in firms that fail to innovate and respond to the new public mandate are likely to face a deterioration in the super-normal dividends to which they have become accustomed (see Table 4 above). If investors in the petitioner or other legacy operators cannot convince their management teams to take a longer term view and accelerate FTTP deployments, attractive margins (i.e. Phase II costing plus a higher risk premium/mark-up relative to DSL and cable) create incentives for others to try to take advantage of the forgone opportunity to deliver a “world class” broadband infrastructure to Canadians.

23. **FTTP’s purported risks:** Bell claims that investments in fibre are risky and extrapolates this claim to request exemptions from mandated third party access to networks it has yet to deploy (outside of Atlantic Canada). Given the future proof nature of FTTP, its attractiveness to customers for delivering very high speed symmetric connectivity, and lower operational and maintenance costs relative to copper, the claim that investing in fibre is risky cannot be substantiated. As we detailed in paragraph 16 of our final submission to the proceedings that led to CRTC 2015-326 after all parties, including Bell, had presented their arguments before the Commission:

“.....Some parties to the proceeding suggested that deploying fibre is very costly and risky. However, we also heard from Bell that for aerial distribution plant, the cost of fibre is nearly equivalent to the cost of copper, with the added advantage that fibre provides an operator with a technologically future proof distribution network providing a platform with higher capacity, greater flexibility to provide advanced services, and lower operating costs. Importantly, there also appears to be a substantial marketing edge to branding a service as a fibre based service (e.g. “Fibre”, “Optik”, “FiberOp”). Generally speaking, this has led to incumbent carriers to choose to upgrade their end-of-

life copper networks with fibre and in specific markets choosing to overbuild their FTTN networks with fibre in order to gain a competitive advantage (Quebec City, Halifax). These considerations indicate that revenue performance and margin performance will be enhanced at lower risk by deploying more fibre than by deploying copper replacement/upgrades. That said, accelerating the overbuild of existing legacy copper broadband networks with fibre would lead to an increase in capital requirements. The implication is that by accelerating fibre deployment an operator can become more efficient and potentially reduce its weighted average costs of capital once the initial investments are made as the company's business will now have less risk associated with it. This strategy has notably been pursued by Verizon Communications Inc. which has aggressively overbuilt the majority of its copper network with FTTH [FTTP] over which it provides all its services under the brand name FiOS. This discussion runs against the grain of the arguments that you have heard attributing disincentives for fibre diffusion to its risky nature. In the long term fibre is the more efficient and least costly option for carriers to pursue to prevent the decline in market share to cable providers."

Decision 2015-326 also highlights the risk for incumbent carriers in *not* investing in fibre. The decision notes that in a competitive market where cable companies can already deploy much faster services on their legacy networks "the Commission expects that the incumbent carriers will generally continue to invest in FTTP access facilities in order to provide enhanced retail Internet access services in response to consumer demand, as well as to compete effectively and efficiently with the Cablecos."¹⁹

24. **From economics to law:** The important point from the above discussion is that from both a theoretical and empirical perspective, there is little support for conjectures by the petitioner that the new regulatory framework will reduce investments in FTTP and in fact we propose that it can stimulate efficient reallocation of capital expenditures from legacy to next generation platforms by better aligning market forces with the legal objectives the Commission is mandated to pursue under Section 7 of the *Telecommunications Act*. In particular S.7.b re "high quality," S.7.c re "efficiency and competitiveness", S.7.f re "reliance on market forces", to achieve overriding objective under S.7.a on "orderly development" of Canada's telecommunications infrastructure provide a number of justifications in support of the policy under review in this petition. Importantly, neither the term investment nor competition is mentioned in S.7 of the *Act*, which casts serious doubt on the legal validity of the analytical framework used by the petitioner in presenting a set of facts selected to direct attention away from inconvenient truths regarding Canada's comparative decline as a broadband leader in terms of quality of service and access of businesses and households to fixed advanced broadband technologies (i.e. FTTP). In fact, we submit that the disaggregated wholesale model adopted by the Commission in CRTC 2015-326 is likely to limit the ability of smaller entities to compete with larger operators because the Commission failed to mandate wholesale access to fiber-to-the-node/middle-mile and fibre transport facilities (including excess dark fibre capacity). As such we disagree with the petitioner's contention that the Commission erred too much in favour of

¹⁹ CRTC 2015-326, paragraph 141.

competition from “resellers” over investment from incumbents, due to the increased incentives to deploy FTTP by the incumbents set out to the decision. Although we think the Commission could have done a better job explaining particular elements of its decision in CRTC 2015-326 in the context of specific statutory obligations it is mandated to pursue such as “development”, “high quality” and “efficiency”, lawmakers that drafted the *Act* did not provide any parties with the right to challenge public policy based on threats or promises to reduce or increase “investment” per se. In this context, it is easy to see to how with the new regulatory framework the Commission moves beyond CRTC 2008-17 in trying to incentivise FTTP deployments by mandating third party access to facilities that it has now determined would be in the public interest to consider essential. The petitioner’s narrow focus on the threat of reduced investment disregards the primary statutory objectives the Commission is mandated to pursue, particularly when it is confronted with irrefutable evidence that its old policy of regulatory forbearance to encourage FTTP investment is not working.

V. Notes on attachments to the petition

25. **Evidentiary basis:** Beyond the missing data, as well as economic and legal flaws in the logic of the petition that is before you, the petitioner relies heavily on a set of studies that it attaches to the petition as an evidentiary basis for its claims throughout the petition. We provide some brief notes on the relevance of studies the petitioner has commissioned to support its position. It is important to note that none of the studies submitted by the petitioner have faced independent review, whereas all the articles that we have submitted have been published in scholarly journals that use a double-blind review process. We suggest interested readers consult the articles that we have attached to this submission for further elaboration on the analysis below.

26. **Benefits of FTTP in Toronto:** Attachment 1 of the petition provides support to the threat by the petitioner that if CRTC 2015-326 is left to stand it will reduce a planned project to start deploying FTTP in Toronto, which will then reduce its investment in jobs/ employment. While we have very specific concerns about the methodology that is used in this report to estimate the benefits of FTTP for Toronto, we agree with the general conclusion that the proposed investment of \$1 billion can generate certain economic gains, some of which the report estimates. In fact, we suggest that the report might be underestimating the benefits that FTTP deployment can bring both to operators and to consumers in a low cost urban centre such as Toronto because it ignores many of the complementary benefits that better broadband can bring to the city and the province. However, we do not see why a threat by one operator to stop one project in one city should have any bearing on the design of a regulatory framework that the Commission has finally adopted after significant consultation with stakeholders from across the country. Given the relatively low cost of fibre deployment in urban centres such as Toronto, if one incumbent does not take advantage of its first mover advantage another will have incentives to do so. The bigger challenge will be in relatively higher cost suburban and rural communities where the business case for even one entity to enter the local market and deploy FTTP is relatively weak. Clear and credible wholesale access rules at the federal level can help overcome coordination failures that make it economically infeasible to rely on facilities-based competition outside of Canada's urban cores to deploy next generation networks. We submit that the threat of reduced investment in new proposed FTTP project in Toronto developed in Bell Attachment 1 is irrelevant as a basis for making policies that affect all Canadians and misleading. Additionally, even if the petitioner chooses not to invest in FTTP, the new regulatory regime creates incentives for others to do so particularly in relatively low cost urban centres, with a result that the incumbent DSL operators will continue to lose market share to operators of higher quality cable and emerging FTTP networks.

27. **Economic impact of unbundling FTTP:** In Bell Attachment 2 the petitioner offers a highly speculative assessment of what the author calls the economic impact of unbundling FTTP. As in the report on the proposed project in Toronto noted above, Bell Attachment 2 essentially estimates an anticipated economic loss to Canada if Bell did not make certain proposed investments in the future. Consequently, it does not account for the potential for others to help fill in the gap if the petitioner follows through with its threat of reduced

investment if CRTC 2015-326 is left to stand as is. Based on previous research that shows a negative correlation between unbundling on legacy platforms and incumbent capital expenditure levels, the petitioner's report estimates that CRTC 2015-326 will reduce the incumbent's investment levels by somewhere between 6 to 49%. In addition to this being a wide range, the report simply assumes that the negative correlation these studies state exists between regulation and investment is a) causal, and b) that cross-country averages will accurately capture the impact of the new regulatory regime in Canada. Our research on the development of broadband connectivity confirms the existence of a negative correlation between some measures of regulation and capital expenditure levels. However, we cannot validate that the relationship is a causal one. More importantly, as in the rest of the petitioner's arguments this report confuses investment inputs with broadband network outcomes such as quality of service and level of access to advanced technologies such as FTTP. Specifically, our research on EU broadband markets shows that despite lower than average investment levels, countries that have been more successful in developing service-based competition have developed higher quality networks in terms of average actual connection quality and have higher FTTP diffusion rates (see Attachment 3 for details). This happens because too much competition between infrastructure operators can lead to inefficient duplication and over-investment, which can be avoided if credible open access obligations are in place that induce operators of essential facilities to offer wholesale services to third party service providers at a reasonable price. Based on international evidence then, the rush to announce new FTTP projects by the incumbents following CRTC 2015-326 decision suggests that the actual impact of the decision on investment levels in the short to medium term is likely to be positive in Canada. Even a decline in overall investment levels in the sector should not concern policymakers if it is associated with less capital expenditures on upgrading legacy platforms and more on FTTP deployments as that would indicate operators are beginning to take a longer term perspective in their technological choices and project selection.

28. **Empirical link between FTTP and employment:** Bell Attachment 3 provides an interesting analysis of the estimated effect of Bell Aliant's FTTP deployment in Atlantic Canada, indicating that it increased employment by around 3%. This study represents a contribution to the literature in that it underscores why policies that promote FTTP deployment are conducive to economic development and employment. We submit that this report actually justifies the adoption of policies such as CRTC 2015-326 aimed at promoting FTTP deployment by offering investors a predictable and reasonable rate of return on their capital expenditures.
29. **Broadband market performance:** Bell Attachment 4 compiles a large volume of data to characterize the performance of the broadband market in Canada. As in the body of the petition, this attachment does not mention concerns about actual speeds or the negligible rate of fibre diffusion across the country. For example, Section 2 of Bell Attachment 4 primarily discusses data associated with advertised speed tiers in Canada and only refers to data from Akamai Technologies to indicate that actual connection speeds in Canada are about average for high income countries. However, as we emphasized to the Commission in the proceeding

that led to CRTC 2015-326, the fact that average speeds in Canada are about average for high income countries hides real concerns about the magnitude of the gap between upload, and particularly download, speeds in Canada compared to leading countries (2-3 times lower relative in terms of download and 5-7 times in terms of upload speed relative to top 10 leading countries according to speedtest/Ookla Net Metrics).²⁰ Higher upload speeds and symmetrical upload and downloads speeds are critical to effective use of cloud-based and peer-to-peer applications which are rapidly becoming the dominant platforms for businesses and individuals. This report also does not mention the relatively low FTTP penetration rates in Canada motivating the Commission to adopt a policy framework that could, if implemented effectively, promote private sector invest in new FTTP deployments while limiting the potential for inefficient duplication.

30. **International evidence:** In Bell Attachment 5 Dr. Renda provides some international evidence in support of the petitioner’s claims, suggesting that “under EU regulation, ILECs in Canada would not be subject to mandatory network sharing” (page 2). Although we agree with this interpretation of the EU regulatory framework, this comparison is misleading in that in the European Union member states continue to retain the primary responsibility for wholesale access regulations and failure to centralize this authority in the European Commission does not imply that open access rules are out of favour in Europe. Indeed, many Northern and Eastern European countries with relatively high quality networks and relatively high FTTP penetration rates are precisely those who have adopted relatively clear and predictable essential facilities obligations, while in larger Western and Southern European countries (with relatively lower network speeds and FTTP diffusion rates) dominant incumbents have been more successful at resisting attempts to impose efficiency enhancing essential facilities interconnection obligations (for a detailed analysis of the interplay between regulation, investment, and network development in the EU please see Attachment 3 to this submission). In terms of the relevance of the South Korea, Japan, and the United States regulatory approaches discussed by Dr. Renda and in the petition, we discussed these cases in our final submission to the proceeding that led to CRTC 2015-326, and we reiterate these comments below for your convenience. The long term wholesale pricing strategy that we suggested the Commission should adopt to speed the pace of transition to fiber represents a variation on the Japanese model designed for current conditions of the Canadian market.
31. **“Relevance of the U.S. policy model:** Most of the data and arguments regarding continuing the 2008-17 forbearance strategy build on perceived success of the U.S. experience with forbearance and fibre diffusion. These parties do not appear to recognize that having replicated FCC’s forbearance strategy in CRTC Telecom Decision 2008-17, the same policy model does not appear to have worked as well in Canada in terms of promoting investment in fibre. In the U.S. some legacy operators have taken advantage of forbearance and have been much more innovative than their U.S. and Canadian counterparts in deploying next generation fibre platforms (e.g. Verizon). The fact that similar policies appear to have generated different results highlights the importance of local market and institutional factors

²⁰ See <http://www.ookla.com/>

in shaping the interplay between public regulation and business strategies of operators. For example, the U.S. is a much bigger market than Canada, with larger firms that are more efficient than their Canadian counterparts due to scale economies. They can therefore raise capital to fund deploying advanced networks at lower prices than their smaller counterparts in Canada. Furthermore, the larger size of the market allows entrants and specialized firms to gain sufficient scale and thus address market failures in situations where the incumbents do not choose to invest. Due to such differences it is not surprising that replicating a model that might seem reasonable in a large market such as the U.S. does not appear to have worked very well given specific conditions in Canada. Additionally, it is important to note that while U.S. fibre diffusion rates are higher than Canada, they are still only about half the OECD average²¹ and U.S. average connectivity speeds are only slightly better than Canada. ... These considerations cast further doubt on the effectiveness of the U.S. regulatory strategy and its relevance as a policy model for smaller jurisdictions such as Canada to emulate.

32. **Relevance of the Korean model:** The South Korean approach to promoting network development is useful to analyze because it has a unique history. In contrast to U.S. and Canada which emphasized service-based competition in the 1990s and moved to policies aimed at promoting platform competition and investment in the 2000s, Korea sequenced its development policy by first investing public funds in infrastructure and then opening emerging high-capacity access and transport facilities to service-based competition.²² While Korea did not adopt local loop unbundling in the traditional sense in which it is understood in North America and Europe, it instead encouraged competition and investment through other means (e.g. subsidies for open access backbone/transport facilities, deploying fibre in apartment complexes and opening each building's network to encourage retail competition, etc).²³ Consequently, the Korean experience does not suggest mandated access is bad for network development and indeed highlights the importance of a multipronged strategy of addressing market failures in digital infrastructure development with policies that promote risk sharing and service-based competition. The Korean experience suggests that policies that promote investments in upgrading last mile links to fibre and opening them up to service-based competition and innovation might be critical in the diffusion of next generation networks. Nevertheless, many of the varied policy instruments used in Korea are not within the purview of this proceeding or the authority of the Commission. Even though instruments such as subsidies are not available to the Commission, well-designed wholesale access obligations that encourage investment in sunrise platforms might be able to help achieve the same objectives in a more cost effective and efficient manner.

33. **Relevance of the Japanese model:** Much like Korea, the Japanese government has also employed industrial subsidies and tax breaks to encourage access and transport network

²¹ OECD (2014). Broadband Statistics. <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm>

²² Choi, S. (2011). Facilities to service based competition, not service to facilities based, for broadband penetration: A comparative study between the United States and South Korea. *Telecommunications Policy*, 35(9), 804-817.

²³ OECD (2013), "Broadband Networks and Open Access", OECD Digital Economy Papers, No. 218, OECD Publishing. <http://dx.doi.org/10.1787/5k49qgz7crmr-en>

development. However, it has also combined these policies with a pro-competition unbundling policy on copper and a pro-investment fibre access policy since the early 2000s.²⁴ In practice this strategy was achieved by initially setting the price of unbundled fibre loops at around 5 times that of copper connections.²⁵ The low price of unbundled fibre led to a rapid loss of market share of the incumbent (Nippon Telegraph and Telephone Corporation, NTT) on legacy platforms to emerging service-based competitors. In combination with this loss of market share on legacy networks a relatively high regulated price for access to unbundled fibre generated strong incentives for NTT to deploy fibre in the mid to late 2000s to customer premises. As this high-powered approach succeeded in establishing NTT as the dominant operator of fibre networks and costs of deployment have been amortized, the Japanese government has gradually reduced regulated access prices to the new infrastructure in order to promote service-based competition and innovation on the high-capacity fibre network that is now near ubiquitous in Japan. The experience from Japan lends support to the proposal that we have submitted to the Commission in this matter to include fibre access and transport facilities within the scope of the obligations and employ a pricing strategy that encourages incumbents and potential entrants to deploy next generation fibre networks. However, ...our proposal accounts for the key weakness of the Japanese approach by recommending that the Commission adopt a clearly predefined approach to wholesale regulation that initially provides a strong market incentive to invest in next generation networks with a mark-up rate that is higher than those on legacy platforms, and then gradually reducing it in the longer term in order to minimize the potential for it to become a barrier to competition and innovation.”

²⁴ Minamihashi, N. (2012). Natural monopoly and distorted competition: Evidence from unbundling fiber-optic networks (No. 2012-26). Bank of Canada Working Paper.

<http://www.bankofcanada.ca/wp-content/uploads/2012/08/wp2012-26.pdf>

²⁵ Domingo, A., Van der Wee, M., Verbrugge, S. & Oliver, M. (2014). Deployment strategies for FTTH networks and their impact on the business case: A comparison of case studies. International Telecommunications Society, 20th Biennial Conference, Rio de Janeiro, Brazil. <http://itsrio2014.com/theprogramme.html>

VI. Constitutional and rural considerations

34. **Constitutional considerations:** In the EU example employed by the petitioner to justify its position, EU member countries (and in some cases sub-national regional governments) are ultimately responsible for delivering social and business infrastructure that promotes economic development, including broadband. The national governments also continue to retain control over the design of access/interconnection obligations, generating a diversity of regulatory regimes across Europe. In Canada however, federal policymakers are responsible for the design of telecom regulations, but provinces are primarily responsible for delivering essential infrastructure that supports business, education, and employment such as broadband. As detailed in our study of the impact of Canada's multilevel system of governance for broadband development (Attachment 2), Canada's unique constitutional arrangements mean that federal regulators do not always internalize the needs of provinces and municipalities searching for innovative solutions to improving broadband infrastructure for citizens and businesses within their jurisdictions. The fact that the Commission has only applied CRTC 2015-326 to large operators in Ontario and Quebec also creates the risk that other areas of the country will not benefit from the higher investment incentives in FTTP that a "glide path" wholesale pricing model can bring to the entire country, particularly in support of various efforts to improve connectivity in under-served rural and remote communities. Having a patchwork of regulations in different regions of Canada will generate various other conflicts and distort market forces contrary to Section 7.f of the *Telecommunications Act*. While beyond the scope of this petition, we recommend that the federal government encourage the CRTC to implement a clear and predictable wholesale access regime that applies to the entire country.
35. **Rural considerations:** The experience with rural broadband development in Canada clearly indicates that market failures in the provision of backbone capacity represent a critical barrier to improving broadband connectivity in relatively high cost communities where the incumbents have limited incentives to invest (see Attachment 4 for a detailed discussion of the importance open access transport facilities and last mile subsidies for improving connectivity in rural communities). For example, under the CRTC 2015-326 ruling, incumbents that have excess transport capacity or dark fibre will not be obliged to provide them at a reasonable price to communities that want to invest in FTTP networks in order to improve connectivity that is available to their residents, businesses, and public institutions. In lower cost urban centres competitive transport facilities providers may have some incentives to enter the market, but in suburban and rural communities the lack of initiative by the Commission and its dismissal of the issue in CRTC 2015-326 will continue to represent a challenge. While we recognize this issue is beyond the scope of this petition, we recommend that the federal government encourages the CRTC to revisit its determination on duplicability and non-essentiality of transport/excess dark fibre capacity in order to promote rural connectivity. As long as the cost-plus mark-up on fibre transport facilities provides a reasonable return on investment, imposing essential facilities obligations on them should encourage incumbents to invest in them, resulting in significant benefits in terms of improving broadband connectivity in rural communities.

Attachments:

1. Reza Rajabiun and Catherine Middleton. "Public Interest in the Regulation of Competition: Evidence from Wholesale Internet Access Consultations in Canada" *Journal of Information Policy* 5 (2015): 32-55.
2. Reza Rajabiun and Catherine Middleton. "Multilevel governance and broadband infrastructure development: Evidence from Canada" *Telecommunications Policy* (2013).
3. Reza Rajabiun and Catherine Middleton. "Regulation, investment and efficiency in the transition to next generation broadband networks: Evidence from the European Union" *Telematics and Informatics* 32.2 (2015): 230-244.
4. Reza Rajabiun and Catherine Middleton. "Rural Broadband Development in Canada's Provinces: An Overview of Policy Approaches" *Journal of Rural and Community Development* 8.2 (2013).