



Prepared for:

Bell Canada
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Forbearance and the Competitiveness of Business Telecom Services

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1. Introduction

In the current proceeding, the Canadian Radio-television Telecommunications Commission ("Commission") will review its classification of wholesale services made in Telecom Decision 2008-17 to determine if changes should be made. In particular, the Commission will consider whether the conditions that supported forbearance of certain Ethernet and competitor digital network ("CDN") access and transport services continue to justify the lack of regulation. The services that were forborne from regulation in the Commission's decision in 2008 that are considered in this report are: (i) Ethernet transport service and high-speed CDN transport services (DS-3, OC-3 and OC-12), which were effectively forborne as of March 3, 2011; (ii) Ethernet access service and high-speed CDN access services (DS-3, OC-3 and OC-12), which were effectively forborne as of March 3, 2013; and (iii) low-speed transport services (DS-0 and DS-1), which were effectively forborne as of March 3, 2013. These services provided various arrangements to competitors for the digital transmission of information at DS-0, DS-1, DS-3, OC-3 and OC-12 speeds.¹ For business customers, these inputs are used to provide data transmission over fibre-based networks.

CDN is the wholesale equivalent of the digital network access ("DNA") retail service that is provided by telecommunications service providers ("TSPs"). DNA (and hence CDN) are primarily used for the transmission of data over a dedicated (i.e., point-to-point) circuit to business customers. In the case of Ethernet services, the transmission is over a shared circuit, as opposed to a dedicated circuit.

In this report, I address the state of competition in data services for which the upstream inputs of Ethernet and CDN access and transport that were forborne from regulation are used. I follow the framework adopted by the Commission in Telecom Decision 2008-17. In particular, I consider whether the withdrawal of mandated access to the forborne Ethernet and CDN facilities has resulted in a substantial lessening or prevention of competition in the relevant downstream markets – namely the supply of higher speed data services to business. If forbearance has not resulted in a substantial lessening of competition, then these services remain non-essential and they should not be subject to a change in classification or reregulation by the Commission.

¹ The specific Bell services that relate to these services are "Access" to Bell central offices at the DS-3, OC-3 and OC-12 speeds; "Intra" service which involves a competitor transporting data between two Bell wire centres at speeds of either DS-0 and DS-1 (low-speed) or DS-3, OC-3 and OC-12 (high-speed); "Inter" which involves a competitor transporting data from one Bell exchange to another at speeds of either DS-0 and DS-1 (low-speed) or DS-3, OC-3 and OC-12 (high-speed); and "Channelization" which involves a competitor aggregating/disaggregating data traffic within a Bell wire centre.

When the Commission established regulated rates for CDN services, CDN was priced at substantial discounts to the DNA equivalent service sold at retail. The pricing of CDN was such that a number of TSPs determined it would be more economical to make greater use of CDN circuits rather than investing in additional infrastructure. Given the size of the rate differential between CDN and DNA for what is the equivalent technology, forbearance by the Commission would be expected to lead to rate increases for CDN. Nevertheless, the Commission determined that there was sufficient revenue available to efficient competitors to justify self-supply or use of third-party fibre supply, and as such the Commission found that the subject access and transport services were practically duplicable. In keeping with this, Bell raised the rates for the CDN services that it offered in Ontario and Quebec.

If these services were truly essential to competitors, with no substitutes available, these rate increases had the potential to raise rivals' costs. Competition in the downstream business data services market might be substantially lessened if rival TSPs that were relying on the forborne CDN services became less effective competitors or if the CDN rate increase forced rival TSPs to increase rates to their business customers. In this report, I directly address these possibilities.

Using data from Bell on its high-speed transport services, which are the services that were forborne in March 2011, I find that while Bell's rates for CDN increased following forbearance, the revenues that Bell earned from rival TSPs purchasing these services did not increase. Rival TSPs may have purchased less because they were able to make greater use of their own or alternative providers' supply of high-speed data transmission access and transport facilities or because they lost share to Bell in downstream business markets. If rival TSPs lost share to Bell as a result of higher CDN rates, this is potentially a cause for concern. I do not find support for this possibility.

Public data provided by the Commission and industry analysts indicates that rival TSPs' share of downstream business data services markets has not declined, which implies that competitors that were relying on the forborne CDN facilities provided by Bell have found alternative supply given their reduced expenditures on CDN services. Data reported in the Commission's 2013 Communications Monitoring Report also shows that rival TSPs have increased their capital investments in fibre-based services at a higher growth rate than that of incumbent TSPs over the 2008-2012 period. Furthermore, prices for high-speed data transmission services to business have not increased since forbearance of these services and subsequent rate increases took effect for CDN. As forbearance has not led to a substantial lessening of competition in the supply of data services to business customers, the forborne Ethernet and CDN access and transport services cannot be considered essential. The Commission was correct in 2008 when it classified these services as non-essential. They remain non-essential today and should not be subject to reregulation.

I elaborate on these findings below. Section 2 describes the economic theory of "raising rivals' costs" which forms the foundation for determining whether upstream inputs are essential to effective competition in downstream markets. Section 3 provides background on CDN and Ethernet services in order to define relevant product and geographic markets within which the state of competition will be considered. Section 4 describes the state of competition at the time of the Commission's decision in 2008. Section 5 describes the rate increases that followed forbearance and the changes in revenue that Bell experienced as a result. Section 6 assesses the competitiveness of the downstream market for the transmission of higher-speed data sold to business customers today. Section 7 provides a brief conclusion.

2. Economic Framework for Determining whether a Substantial Lessening of Competition Occurred

Following the Commission's decision and subsequent appeals, Bell increased the wholesale price of CDN high-speed access and transport services.² If these services were misclassified as non-essential by the Commission, when in reality they are truly essential, then the rate increases that followed the Commission's decision have the potential to substantially lessen competition in downstream business services. Such an outcome would occur if the firm controlling the essential input is dominant and increases the price of access to the essential input as a means of disadvantaging rivals who require access to the essential input in order to compete effectively.³ In essence, the dominant firm wishes to charge higher than competitive prices for its services in the downstream market, yet it needs to protect itself from undercutting by rival firms. It can accomplish this by raising its rivals' marginal costs through increasing the price of an essential input. With higher marginal costs, the rivals will be forced to charge higher prices in downstream markets where they compete with the incumbent firm. Consumers are harmed because all firms now charge higher prices. A fundamental condition for this theory to apply is rivals cannot effectively substitute away from the essential input when its price increases if they are to continue to provide the same level of services to downstream customers. Rivals are either forced to continue to purchase the essential input at much higher prices, or they must cede share to the incumbent in the downstream market if they reduce their consumption of the essential input.

² In the case of Ethernet services, Bell did not have a wholesale Ethernet access service (EAS) tariff strictly available to only wholesale customers and thus there was no service to forbear from regulation at the time of the Commission decision in 2008. Bell did have an Ethernet Transport Service (ETS) which was forborne in 2011 after a three year transition period.

³ See Steven C. Salop and David T. Scheffman (1983) "Raising Rivals' Costs," 73 *American Economic Review (AEA Papers and Proceedings)*, May, 1983; and Thomas G. Krattenmaker and Steven C. Salop (1986) "Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price," 96 *Yale Law Journal*, December, 1986.

In order for raising rivals' costs to be a profitable strategy for the incumbent firm, several conditions must exist. First, rivals' marginal costs must be raised by a significant amount when the price of the essential input is increased. Second, the costs that the incumbent incurs in order to raise its rivals' marginal costs must not exceed the increase in price (otherwise the incumbent is incurring losses and hence the theory reverts to one of economic predation). Third, conditions within the downstream market must be such that the increase in price by the incumbent firm is sustainable (e.g., entry barriers are high and demand is sufficiently inelastic). In other words, the incumbent firm must have market power in the downstream market. In addition to these conditions, in the case of a regulated firm, the downstream firm must have some control over the wholesale price or non-price aspects of access to its essential facility or infrastructure that it sells to rivals.

The theory of raising rivals' cost is often exemplified by a regulated firm, particularly one in a network industry with control over essential components that are required by the regulated firm's rivals in order to compete.⁴ If the regulated firm can impede its rivals' access to the essential upstream input, while ensuring that the regulated firm obtains the quantity (and quality) of the essential input that it requires in order to satisfy its own downstream needs, the regulated firm can divert customers from its rivals to itself. Rivals are forced to charge higher prices for their downstream services given their higher costs of access to the essential input.

Regulatory and competition authorities need to concern themselves with such actions when they result in higher prices or reduced services to downstream customers. When the incumbent firm has market power, increasing the rival's costs may reduce the rival's market share, reducing the rival's competitive significance, hence allowing the incumbent to charge higher prices in the downstream market for a given product or service than would otherwise have been possible.⁵ Raising rivals' costs can take a variety of forms from refusal to supply (or supply at an extremely high price which is tantamount to a refusal), discriminatory access fees, exclusionary conduct or degrading rivals' quality of access.⁶ While, it is not costless to an incumbent firm to undertake a raising rivals' costs strategy (since it results in fewer

4 An input is essential if competitors cannot duplicate it on a cost-effective basis. Thus, if a sufficiently close substitute for a firm's infrastructure or facility is available to its rivals, access to it is not likely essential. Essential inputs are more common in network industries where an interconnected infrastructure increases the value of the services provided to consumers.

5 In the extreme, such strategies can render future participation of the rival unprofitable leading to its exit and possible price increases by the incumbent post-exit.

6 The economics literature on vertical restraints recognizes that a variety of strategies may enable the upstream firm to extend its market power in these circumstances. See Janusz A. Ordover and Garth Saloner (1989) "Predation, Monopolization, and Antitrust" Chapter 9 in *Handbook of Industrial Organization*, Richard Schmalensee and Robert D. Willig (eds), Amsterdam, Holland.

upstream essential input services being sold to rivals), these costs may be offset by the benefit to the incumbent firm of protection of its downstream retail market share or dominance.⁷

In addition, through its control over essential inputs, the integrated incumbent may be able to damage unintegrated rivals' reputations. For example, in cases where reliability of service is important, the incumbent could disadvantage rivals by providing inferior quality access to essential inputs that may result in disruptions in the ability of rival firms to provide service to their customers. Customers do not know, or are indifferent to, the cause of the disruption in service. They note only that a disruption has occurred with a rival firm and not with the incumbent firm. This can allow the incumbent to capture, or maintain, various first-mover advantages since the incumbent develops the reputation for higher quality service relative to its rivals.

3. Background on CDN Services

3.1 CDN Regulation

In 2002, the Commission established a special class of DNA services used by TSPs that did not have these facilities, which became "CDN" services⁸. CDN was divided between access and transport facilities, which provide transmission from a customer's premises either to a competitor's switch in the same wire centre, or to the competitor's co-located facilities within the incumbent TSP's wire centre. Simple resale of CDN was not permitted.

Low-speed CDN access (DS-0 and DS-1) services were classified by the Commission as Category 1 near essential services in 2002 and had tariffed rates set at Phase II costs plus a 15% markup due to the fact that these services were largely provided over copper facilities and were not readily duplicable at the time.⁹ In contrast, high-speed CDN access (DS-3, OC-3 and OC-12) services are provided over fibre facilities, which are duplicable. Given the duplicability of fibre, the Commission allowed the markup on high-speed CDN access to exceed 15% on these facilities. Nonetheless, the Commission set a markup that was lower for DS-3 access than for OC-3 and OC-12 access as it noted there were more constraints to building alternative DS-3 access facilities than for the higher-speed services of OC-3 and OC-12.¹⁰ In setting the markups over Phase II costs, the Commission indicated that it was

⁷ Hence, it is not necessarily profit maximizing for an integrated incumbent to engage in access discrimination. Thus, a case-by-case analysis is required. However, when access discrimination is profitable, these costs are more than offset by the benefits obtained by the incumbent firm.

⁸ Telecom Decision CRTC 2005-6, I. Background.

⁹ *Ibid.*

¹⁰ Telecom Decision CRTC 2005-6, paragraphs 216-217.

balancing competitors' need to build a customer base against the need to set a markup high enough to incent competitors to invest in alternative facilities.¹¹

With respect to CDN transport, the Commission noted that these facilities were duplicable and hence the markup could be higher than 15%. The higher-speed transport facilities of OC-3 and OC-12 had the highest markups, which in the case of Bell and Telus allowed these services to have wholesale tariffs set equal to the retail rates at the time.

Inter-city transport – Metro IX – was found to have more constraints in existence at the time in terms of building infrastructure to duplicate the infrastructure of incumbent TSPs, and hence the Commission set the wholesale tariffs for this service equal to the retail rates for Adjoining IX transport minus a discount. The Commission did not specify the discount at the time.

At the time that CDN was established, its tariffed rates were substantially below Bell's tariffed DNA rates. Given the significant price difference between DNA and CDN rates, there was considerable migration by Bell's wholesale customers to CDN following 2002. The increase in demand at the time suggests that many alternative TSPs found it cheaper to acquire CDN services at mandated rates than to invest in their own infrastructure for these services. The gap in rates between CDN and DNA has been reduced over time, yet it remained large at the time of the Commission's forbearance decision in 2008. Figure 1 provides a comparison of Bell's monthly rates for CDN and DNA services just prior to the CDN forbearance dates of March 3, 2011 and March 3, 2013.

11 Telecom Decision CRTC 2005-6, paragraph 212.

Figure 1: CDN and DNA Monthly Rates Prior to Forbearance, Bell Canada

Forbearance Date: March 3, 2011			
	Monthly Rates		CDN v. DNA Retail
	CDN	DNA	
DS-3 Metro IX	\$371.82	\$738.70	-50%
DS-3 Intra	\$760.63	\$1,000.00	-24%
OC-3 Intra	\$1,439.58	\$1,430.00	+1%
OC-12 Intra	\$4,429.48	\$4,400.00	+1%
Forbearance Date: March 3, 2013			
DS-3 Access (Band A/Band 0)	\$462.57	\$1,012.50	-54%
OC-3 Access (Band A/Band 0)	\$1,027.10	\$2,925.00	-65%
OC-12 Access (Band A/Band 0)	\$2,563.72	\$4,800.00	-47%
DS-0 Intra	\$3.10	\$29.25	-89%
DS-0 Metro IX	\$3.45	\$6.85	-50%
DS-1 Intra	\$59.56	\$240.00	-75%
DS-1 Metro IX	\$41.33	\$82.10	-50%

Source: Bell Canada

The Commission would have been aware of the difference in tariff rates between DNA and CDN at the time of its Telecom Decision 2008-17. Hence, the Commission (and other industry participants) would expect that forbearance with respect to CDN would lead to increased rates up to those in existence for the same service sold at retail, notably DNA. Such rate increases would not be problematic, however, where the services are practically duplicable because an efficient competitor is able to earn sufficient revenue to justify self-supply or use of third-party supply. Indeed, the Commission would be incenting alternative TSPs to make greater use of self-supply and to increase investments in fibre generally with the policy change. As was noted by a number of parties at the hearing preceding Telecom Decision 2008-17, the low wholesale rates for CDN curtailed several TSPs' investments in their fibre networks since it was cheaper to make use of the regulated inputs rather than build their own infrastructure.¹²

3.2 Ethernet Regulation

Higher-speed CDN access and transport services at DS-3 and higher bandwidth are provided through fibre facilities by TSPs to business customers. CDN is a dedicated point-to-point

¹² See, for example, responses filed during the 2008-17 proceeding by Telus(MTS Allstream)12Apr07-106, Bell Canada(Bureau)12Apr07-25 – factors Bell considers when deciding to lease vs build, and Atria(Companies)12Apr07-20, as well as Vidéotron's initial evidence at paragraph 57.

service. An alternative service that is available to provide low and high-speed data transmission to business customers is Ethernet service. Ethernet is a packet-based protocol that allows for the networking of multiple devices over a shared network.¹³ With Ethernet traffic, data transmission from a customer's premise is transmitted through an Ethernet cloud to its end point. Any particular data packet may take a different path through the cloud to reach its destination.

Further to its Telecom Decision 2004-5, the Commission classified any Ethernet access components that were sold to competitors as essential services that were then made available to alternative TSPs at tariffed rates.¹⁴ An Ethernet interface service for use by competitors was also established and tariffed in the same proceeding.¹⁵ Bell did not have a separate price structure for Ethernet access service sold to competitors at the time, but instead provided Ethernet access to competitors as part of Bell's broader retail offerings of Ethernet services. In its Telecom Decision 2008-17, the Commission assigned wholesale Ethernet access service to the non-essential category subject to forbearance in March 2013. While Bell did not have a wholesale Ethernet access service, it does sell a retail Ethernet access service, which is regulated under the retail price cap regime in the "Other Capped – Data Services" basket. Under the price cap regime, price increases for retail Ethernet access are limited to 10% per year and are also limited by the requirement that all services within the basket cannot have price increases exceed the rate of inflation.

Ethernet transport facilities have not been regulated for competitor use as the Commission determined that sufficient alternatives existed that these should not be classified as essential inputs.¹⁶ In Telecom Decision 2008-17, the Commission determined that high-speed fibre-based transport services including Ethernet services should be forborne given the high incidence of competitor self-supply or alternative supply of fibre-based transport facilities.

3.3 IP VPN as an Alternative Service

IP VPN is another viable alternative to a dedicated circuit or to Ethernet, which offers a Wide Area Network ("WAN") solution. IP VPN access can be provisioned on copper up to speeds of 5 Mbps, while higher speeds are provisioned on fibre networks. The Commission has never mandated competitor access or set regulated rates for IP VPN services. Customers use IP VPN to create a virtual private network for final customers over the Bell network thereby avoiding network builds. IP VPN is a cost-effective means to securely link geographically

13 Telecom Decision CRTC 2004-5 at footnote 1.

14 *Ibid*, paragraph 57.

15 *Ibid*, at paragraph 59.

16 *Ibid*, at paragraphs 63-64.

dispersed sites at lower speeds. IP VPN networks may be owned and managed by the final customer or by Bell, with variants including ownership by the customer and management by a TSP (Bell or an alternative TSP). Wholesale customers of Bell's IP VPN services use these to reach locations where they do not want to build their own networks. At higher speeds (of 10 Mbps or faster), Ethernet is typically cheaper than IP VPN. A number of competitors sell IP VPN services in Ontario and or Quebec including cable operators, Rogers, Cogeco and Vidéotron as well as out of territory incumbents MTS Allstream and Telus. The Commission has not regulated WANs, including IP VPN, since Telecom Decision 2000-553 given its finding at that time that ample competition existed among suppliers for WANs.

4. Assessing the Extent of Competition

4.1 Commission Framework

In Telecom Decision 2008-17, the Commission revised the conditions that must be met in order for a wholesale service to constitute an essential facility to be:

- i. The facility is required as an input by competitors to provide telecommunications services in a relevant downstream market;
- ii. The facility is controlled by a firm that possesses upstream market power such that withdrawing mandated access to the facility would likely result in a substantial lessening or prevention of competition in the relevant downstream market; and
- iii. It is not practical or feasible for competitors to duplicate the functionality of the facility.

As indicated in Telecom Decision 2008-17 (at paragraph 38), in order for a service to be reclassified to a category that justifies forbearance, the facility must be duplicable on a sufficient scale to limit the ability of an incumbent TSP to use any upstream market power it may possess to influence downstream competition. Two competition assessments are needed to apply the Commission's test. First, what is the extent of substitution possible for the upstream input? Second, what is the extent of competition in downstream markets that competitors compete within using the upstream input?

4.2 Extent of Substitution Upstream

In order for an input to be practically duplicable, the Commission indicated that a reasonably efficient competitor needs to earn sufficient revenue to justify self-supply or use of third-party supply for the upstream facility.¹⁷

In Telecom Decision 2008-118, the Commission stated that the data provided to it in confidence demonstrated that in metropolitan areas a large proportion of high-speed access and transport facilities, including Ethernet, were either self-provided or obtained from parties other than the incumbent TSP.¹⁸ The Commission further noted that "the record of this proceeding does not raise doubt as to the accuracy or reliability of" the data upon which the Commission relied to reach this conclusion.¹⁹ In Telecom Decision 2008-17, with regard to fibre-based access and transport services, including CDN and Ethernet services, the Commission found that "the record indicates a high incidence of competitor self-supply or alternative supply of fibre-based access and transport facilities. The Commission considers that the reported level of alternative supply demonstrates the existence of competition in the upstream market for such facilities."²⁰

4.3 Assessing Extent of Competition Downstream – Analytic Framework

Analysts typically begin any assessment of the extent of competition by defining the relevant markets within which firms operate. Market definition is not the end in itself, but rather it provides a base from which the competitive effects analysis proceeds. Market definition is complicated when considering differentiated products, as is the case here. The characteristics that distinguish one product from another may vary continuously. As a result, it may be very difficult to delineate a boundary "within" which products are identified as competing against each other versus those products "outside" the boundary that do not. Even if such a line can be drawn, differentiation means that products "within" the boundary may compete with each other to varying degrees, depending on how closely substitutable the marginal consumer finds these products. As well, it is important not to lose sight of the constraints imposed by products that are found to lie "outside" the defined market, as these may also constrain the pricing and quality offerings of firms producing the products within the defined market

Relevant product markets define the set of products and services that are considered to be sufficiently close substitutes to each other from the buyer's perspective such that if the price

17 Telecom Decision CRTC 2008-17, paragraph 41.

18 Telecom Decision CRTC 2008-118, paragraph 16.

19 Telecom Decision CRTC 2008-118, paragraph 16.

20 Telecom Decision CRTC 2008-17, paragraph 118.

of the product or service was raised buyers would turn to substitute products and services in large enough numbers to make any exercise of market power unprofitable.

Relevant geographic markets define the locations from which suppliers of the identified products can serve customers such that buyers view these as close substitutes to each other. Analogous to the conceptual exercise undertaken when delineating relevant product markets, we ask what would happen if the price of the relevant product within a particular location were raised. If buyers would turn to more distant suppliers for the relevant product in large enough numbers to make any exercise of market power unprofitable, these more distant suppliers are included in the relevant geographic market.

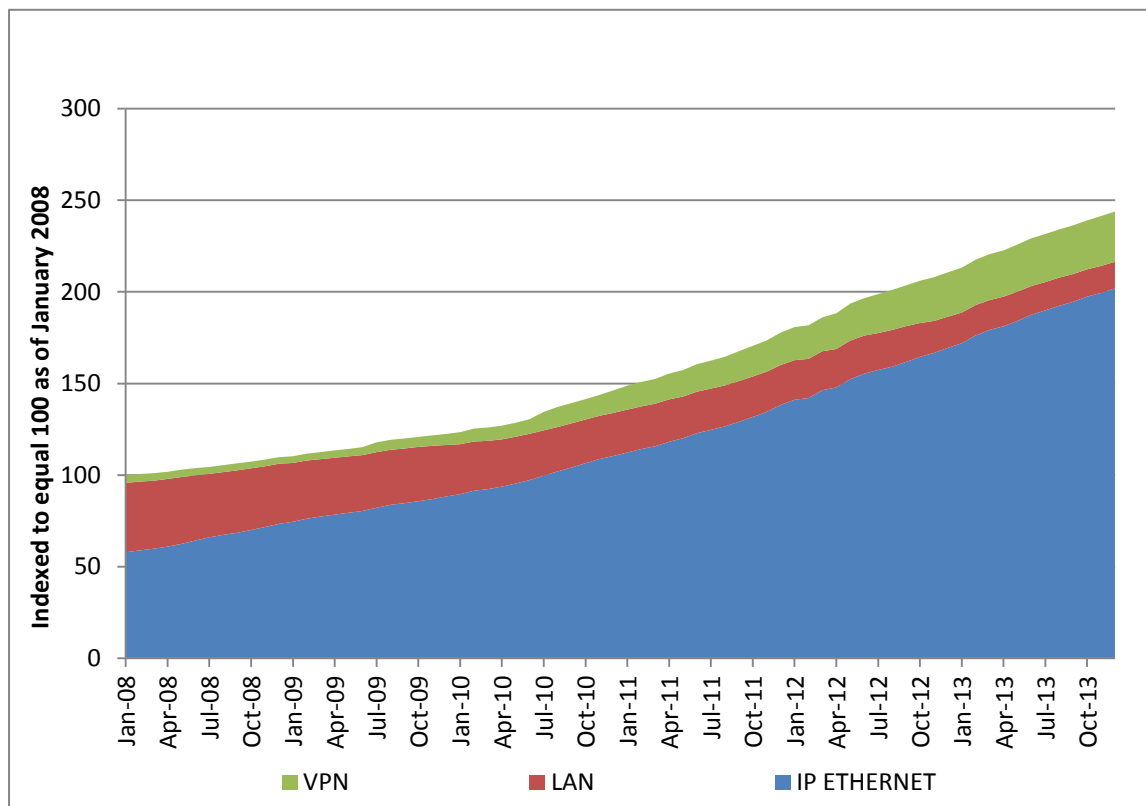
4.4 Downstream Competition in Business Data Services – Defining Markets

A business is likely to be indifferent to the underlying technology that is used to provide any particular high-speed data service as long as the technology allows for very reliable, high-quality transmission at the required bandwidth and is cost effective.²¹ While potentially indifferent to the underlying technology used to provide a particular speed of data transmission, a business customer is likely to have specific geographic requirements with respect to the origin and destination points of any transmission. As a result, suppliers will need to be able to serve the customer's specified points of presence ("POPs"). While incumbent TSPs have ubiquitous networks within their specific territories, it is also the case that rival TSPs have extensive fibre networks across Canada. The extent to which any one TSP can serve a specific business customer depends on that TSP's current network, its access to alternative networks, the cost of access to alternative networks, and the cost to expand its network to serve an individual customer's POP requirements.

With respect to the use of technology, business customers have been steadily switching from high-speed DNA services to Ethernet services that offer comparable sustained speeds of transmission; in particular, growth in Ethernet has come at the expense of private line sales. Figure 2 provides the growth in Bell's total number of Ethernet lines since 2008, compared to numbers of local area network ("LAN") and VPN lines (which are also growing).

²¹ There may be circumstances where a business needs to make investments in customer premise equipment, which would affect the cost effectiveness of different alternative technologies.

Figure 2: Number of Ethernet, LAN and VPN Lines, Bell Canada



Bell's experience is not unique. The Commission's Monitoring Reports similarly identify growth in new data compared to legacy services. Moreover, Ethernet is expected to grow further. In its August 2013 industry report, Ovum is forecasting significant continued growth in the use of Ethernet services by business customers. Worldwide growth in the enterprise Ethernet services market is projected to have a CAGR of 13.6 percent from 2012 to 2018.²² Regionally, Ovum is projecting steady growth for North America at a CAGR of 11.0 percent from 2012 to 2018.²³ As businesses continue to demand higher-bandwidth services to deal with their data transmission requirements, Ethernet has become the de facto WAN service in Ovum's view.

In light of the evidence of customer switching and the comparable speeds of transmission between DNA and Ethernet for higher speeds, and between DNA and IP VPN at lower speeds, they should be treated as part of the same relevant product market when considering the alternatives available to business customers and the competitiveness of business services

²² Ovum, *Enterprise Ethernet Service Forecast Report: 2011-18* (TE008-0013566) 01 August 2013, page 1.

²³ *Ibid*, page 5.

markets. Substitution at the business customer level between dedicated circuits, Ethernet and IP VPN will act to constrain the prices that can be charged for upstream components to provide these services. If, for example, the price of CDN access at a speed of DS-3 were to increase substantially, this will increase the cost to a business of using a dedicated circuit. In such circumstances the business customer may switch from a dedicated circuit to Ethernet depending on the magnitude of the cost increase for the dedicated circuit. As a result, even if there were limited substitution among the upstream components for technical reasons, the substitution that occurs downstream between dedicated circuits and Ethernet will constrain the pricing of upstream components used to provide a particular service.

At the time of Telecom Decision 2008-17, incumbent TSPs (including in-territory and out-of-territory operations) had a market share, based on revenues, of approximately 80% for data protocol services consisting of New Data (Ethernet and IP VPN), and their in-territory operations had a 50% share.²⁴ The revenue share of alternative TSPs was 21%.

The distribution of shares across providers varied depending on the provided service. The Commission's 2013 *Communications Monitoring Report* indicates that that in-territory Incumbent TSPs have a higher share of dedicated private line revenues compared to their share of New Data protocol (including Ethernet and IP VPN protocols) revenues,²⁵ which are growing faster than dedicated private lines.²⁶ In-territory Incumbent TSP's national share of New Data revenues in 2008 was estimated to be 28% lower than their national share of private line revenues.

Turning to the question of geographic coverage, at the time of Telecom Decision 2008-17, no single firm had ubiquitous coverage throughout Canada. Instead, individual companies varied in the density of their POP to serve business data transmission requirements. Differences may then exist across specific geographic locations – even POPs – as to the specific set of current fibre connections in that location. Nevertheless, where there are enough similarities across individual locations in Canada with respect to overall demand and supply characteristics for the supply of fibre-based data services to business customers then for practical purposes one may consider the extent of competition across these similarly-

²⁴ 2009 Communications Monitoring Report, table 5.4.3. Based on data for 2007.

²⁵ 2013 Communications Monitoring Report, tables 5.4.4 and 5.4.5.

²⁶ 2013 Communications Monitoring Report, tables 5.4.2 and 5.4.3.

situated locations, rather than assessing the extent of competition within each city or even to each POP.²⁷

Fibre is most extensively deployed by incumbent and non-incumbent TSPs throughout (and to connect) major metropolitan centres in Canada, as this is where business customers are primarily located. Within and between Canada's largest cities, there is sufficient revenue available to support multiple fibre networks. In 2008, industry reports identified the following major telecom providers with extensive fibre networks throughout metropolitan areas: Atria Networks which was formed from a number of municipal electric utilities ("MEUs") telecom units, and which has since been purchased by Rogers Business Solutions; Bell Aliant; Bell Canada; Hydro One Telecom; MCI Canada; MTS Allstream; Rogers Business Solutions; Telus; and Toronto Hydro Telecom, which has since been purchased by Cogeco. The extent of revenue available together with the deployed fibre at the time was great enough that the Commission found that the subject Ethernet and CDN access and transport services are practically duplicable.

5. Competitive Environment Today

5.1 Changes in CDN Pricing since Forbearance

Industry participants were first made aware of the end of regulated wholesale rates for Ethernet and CDN high-speed transport facilities, high-speed access facilities, and low-speed transport facilities in March 2008 at the time of Telecom Decision 2008-17. Further to this, in December 2008 the Commission denied MTS Allstream's application to review and vary Telecom Decision 2008-17 with respect to wholesale Ethernet services. The Order in Council in 2009, denying MTS Allstream's appeal of the Commission's decision in 2008-118 confirmed the regulatory regime. From the time of the Commission's decision in 2008-17, industry participants had three or five years to plan for the change in regulation depending on the affected service.

With the Commission's decision to forbear from regulating Ethernet and CDN high-speed access and transport facilities, Bell announced rate increases for these services to be effective as of March 2011 and March 2013, in many cases leading to negotiated agreements regarding these services at rates lower than those initially announced.

²⁷ The Competition Bureau uses a similar approach when it considers the potential effects from a merger when the merging firms compete across several markets and face the same competitors in each, the Bureau may use an aggregate description of these markets simply as a matter of convenience (see footnote 27, at page 17 of the Competition Bureau's *Merger Enforcement Guidelines*, October 6, 2011).

5.2 Changes in CDN Demand since Forbearance

As would be expected with rate increases for services for which substitutes exist, demand for CDN dropped as wholesale customers transitioned to alternative suppliers, reworked their networks or moved to purchasing DNA instead of CDN. Reductions in demand for CDN were experienced in advance of the effective date of forbearance. Figure 3 shows the total number of in-service circuits for Bell's DS-0, DS-1, and DS-3 transport circuits for its Inter services indexed to 100 as of January 2008. Figure 4 shows the total number of in-service circuits for Bell's low-speed (DS-0 and DS-1) transport CDN Intra services and the total number of in-service circuits for Bell's high-speed (DS-3, OC-3, OC-12) transport CDN Intra services indexed to 100 as of January 2008.

Figure 3: Inter Circuits for CDN DS-0, DS-1 and DS-3, Bell Canada

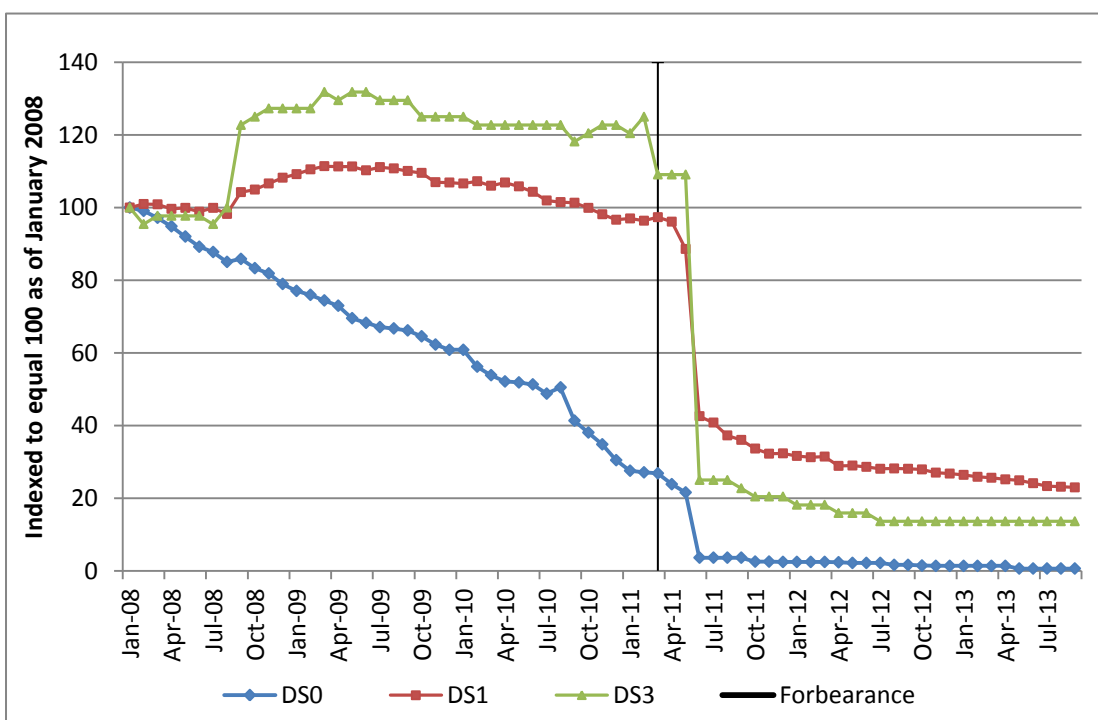
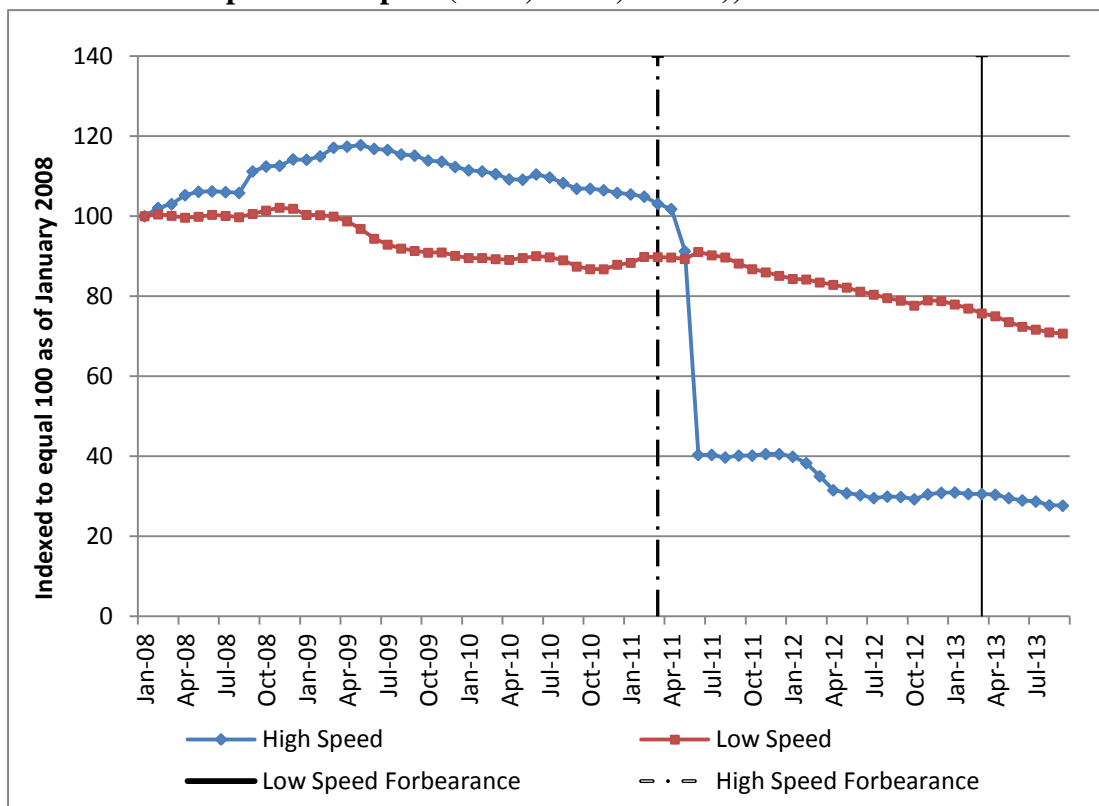


Figure 4: Intra Circuits for CDN Low-Speed Transport (DS-0, DS-1) and CDN High-Speed Transport (DS-3, OC-3, OC-12), Bell Canada



5.3 Substitution from CDN to DNA Services

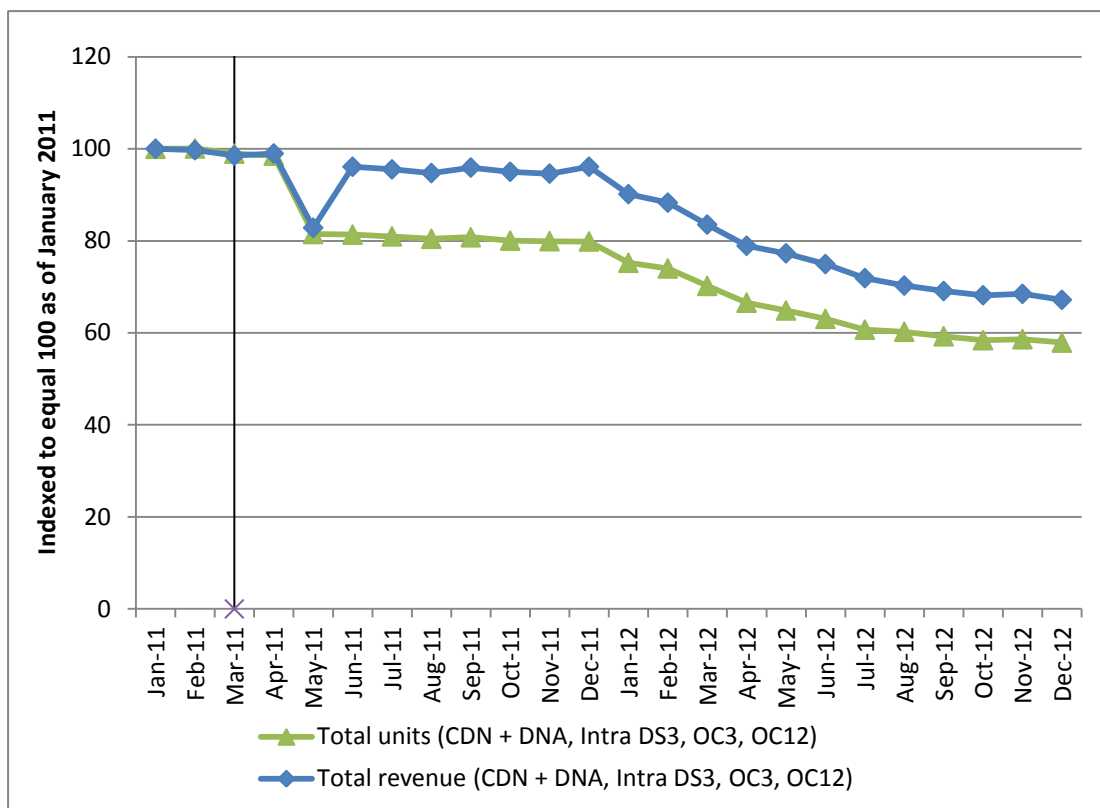
With the increase in CDN transport rates at higher speeds to those comparable to DNA rates, wholesale customers switched some of their CDN service purchases from Bell to instead acquire DNA services. While wholesale customers switched from acquiring CDN high-speed transport circuits to DNA circuits, Bell's total revenues did not increase by as much as the rate change itself.²⁸

Immediately following forbearance, the switch from CDN to DNA was such as to maintain Bell's revenues for high-speed transport CDN and DNA at comparable levels to those that existed prior to forbearance. However, since late 2011, Bell's total revenues for CDN and

²⁸ This analysis is done using Intra circuits, because changes in the classification of Inter products sold by Bell since forbearance do not allow for a comparison of like products over time. At the time of the CRTC Decision 2008-17, Intra accounted for 81% of Bell's CDN circuits.

DNA transport at higher speed have been declining, which indicates reduced reliance on Bell's network by competitors. Figure 5 provides the total number of CDN and DNA transport in-service circuits sold to alternative TSPs by Bell for Bell's "Intra" service at speeds of DS-3, OC-3 and OC-12 levels from January 2011 onward. Bell's revenues for these services are also shown. Total circuits and revenues are indexed to a value of 100 as of January 2011.

Figure 5: Combined CDN+DNA High-Speed Transport (Intra DS-3, OC-3 and OC-12) Circuits and Revenue, Bell Canada



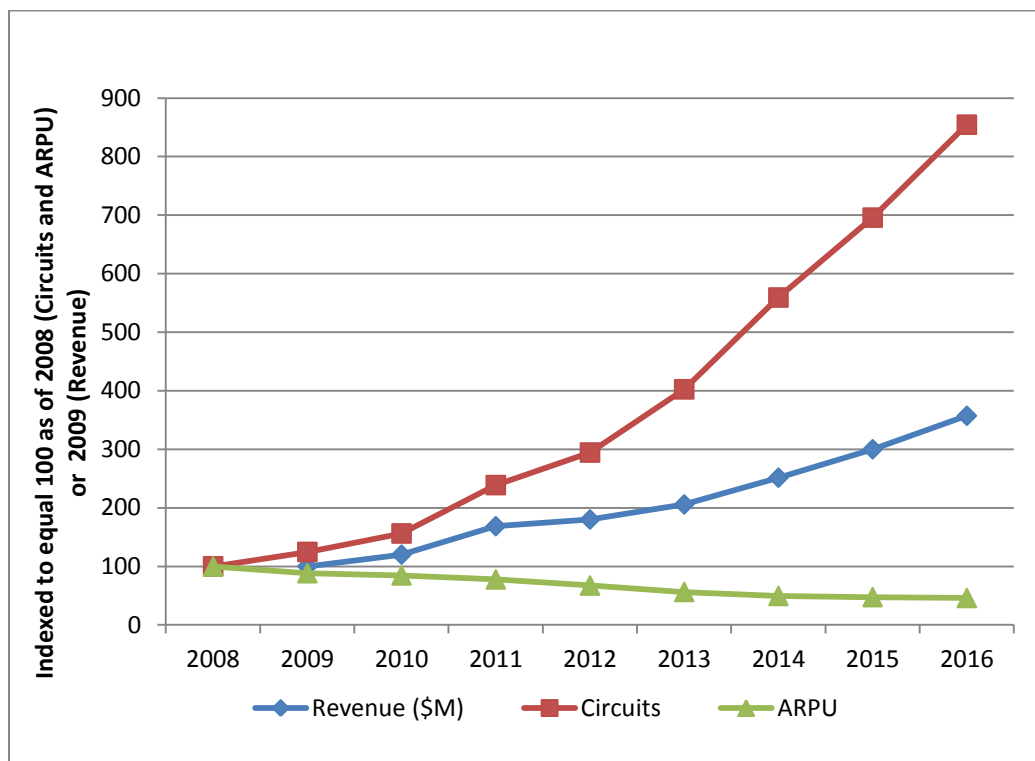
5.4 Changes in Ethernet Prices since Forbearance

As described earlier, there was no tariffed wholesale Ethernet access service offered by Bell at the time of the forbearance proceeding; instead Bell's Ethernet access service was (and remains) a retail service that is part of the price cap regime, and hence rate increases are curtailed. Bell's Ethernet transport service is priced as Ethernet Internetworking ("EI") services following forbearance. EI is higher priced than Ethernet transport, but it also provides more features. Bell provides multiple wholesale Ethernet solutions ranging from path speeds ("EVC") of 1.0 Mbps to 1.0 Gbps and access up to 10 Gbps: (i) a switched

Ethernet virtual private line service, which provides managed point-to-multipoint service delivered via virtual connections across Canada allowing for advanced applications requiring high bandwidth, high degrees of connectivity while retaining control of IP security, routing and configuration with multiple classes of service available; (ii) a switched Ethernet private line service, which is a point-to-point service that also allows for prioritizing customer traffic and (iii) an Ethernet Private Line service, with choices of speeds (from 10 Mbps to 10 Gbps), which is used for point-to-point, dedicated bandwidth direct connections. In comparison, CDN speeds range from 1.544 Mbps to 622 Mbps.

Ethernet prices have been declining since 2011, while demand has been increasing. Figure 6 provides demand for Bell Canada's Ethernet services sold to wholesale customers as well as the average revenue per user ("ARPU").

Figure 6: Wholesale Customer Demand for Ethernet and ARPU, Bell Canada



5.5 Self-Supply and Alternative Infrastructure from that of Incumbent TSPs

Demand for Ethernet circuits is expected to continue to increase substantially, and as noted prices are expected to decline given the extent of competition among suppliers of Ethernet services. There are numerous providers of Ethernet services in Canada across local, regional and national players.

The services at issue here are provided over fibre networks. To understand the extent of self-supply or supply available from alternative providers requires information on non-Bell fibre networks. While the Commission will have access to more detailed data on all firms' networks, even the more limited publicly available information supports the claim that there is ample alternative fibre supply to that of Bell throughout Canada. For example, Figures 7-9 provide fibre network maps for Telus, Rogers and Allstream obtained from each provider's website. All three carriers have national fibre coverage.

Figure 7: Telus Fibre Network

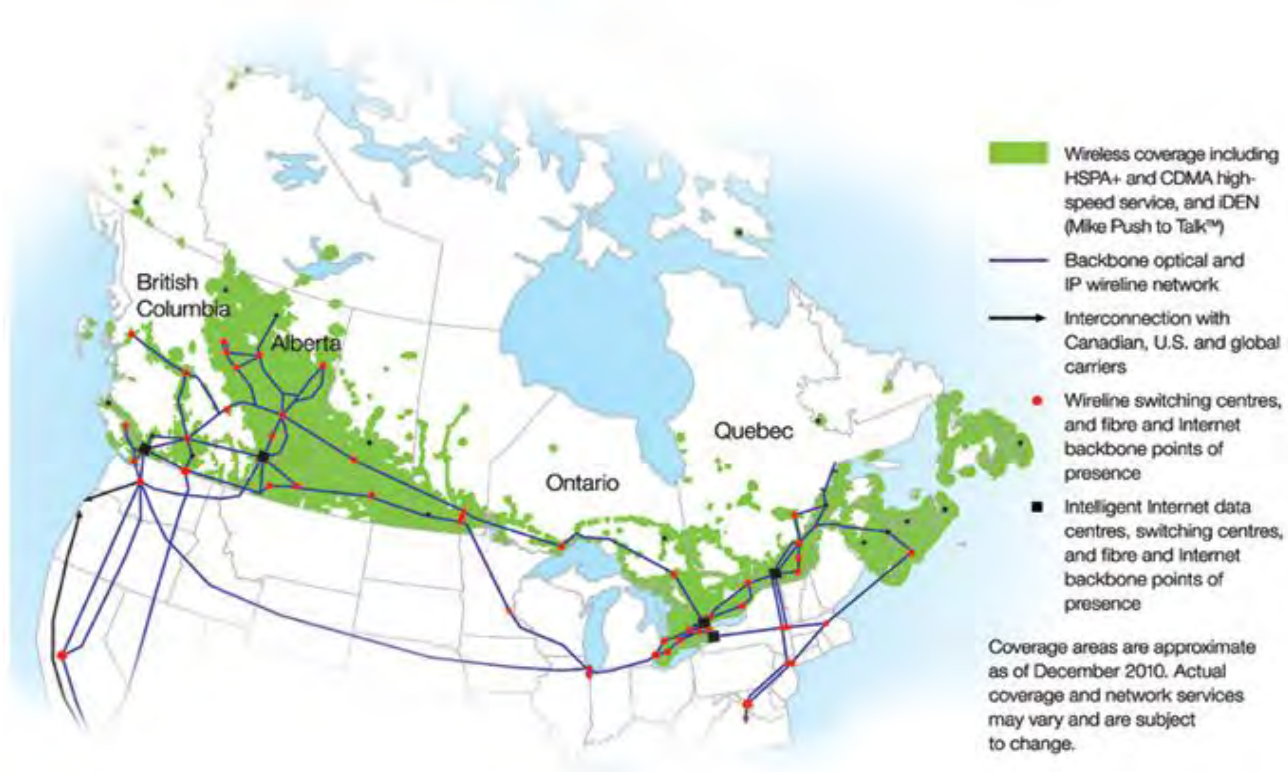


Figure 8: Rogers Business Services Fibre Network

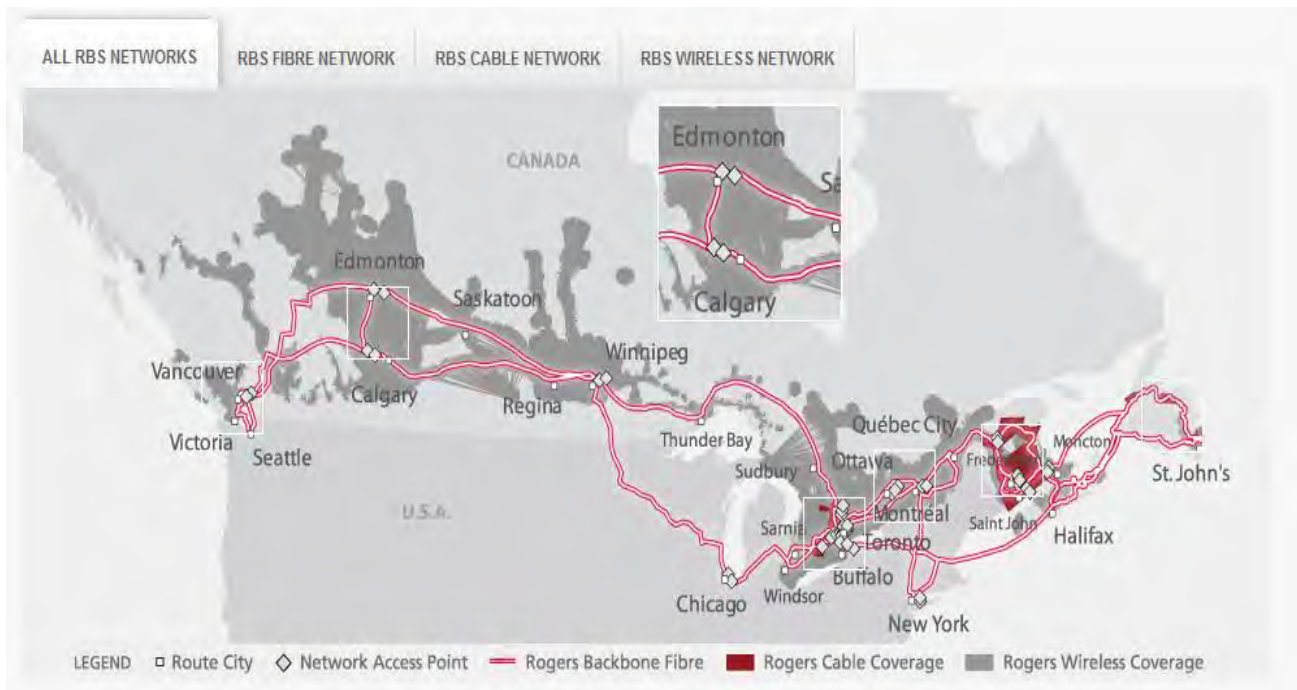
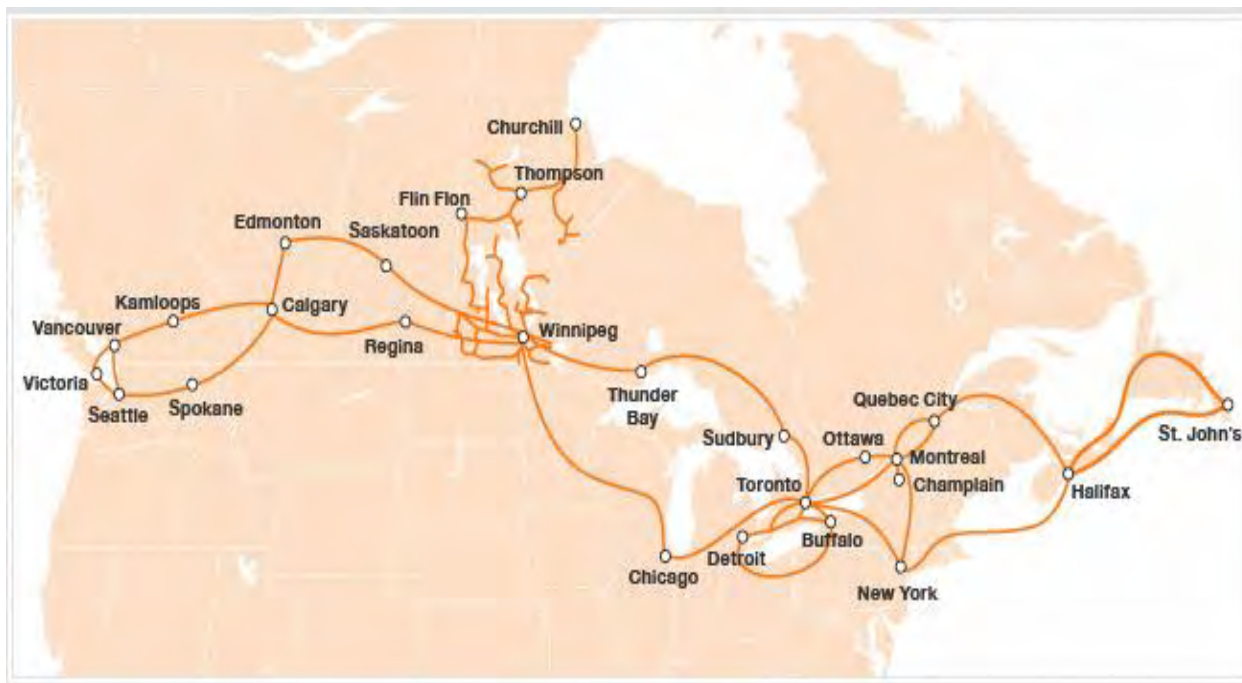


Figure 9: Allstream Fibre Network



Additional information on the extent of competitors' self-supply can be gleaned from information on their Ethernet products. Telus,²⁹ Rogers/Atria,³⁰ and Allstream³¹ sell EI and EPL services to business customers. All three competitors have excellent or good coverage in large and smaller Canadian cities as well as U.S. "meet me" points that allow traffic to be transitioned to a US carrier. In addition to these three competitors, Vidéotron³² and Cogeco³³ also sell Ethernet in some large and smaller cities. Cogeco's fibre network expanded considerably after it acquired Toronto Hydro Telecom.³⁴ As well, power utility companies have begun the transformation of their transmission and distribution grids to Ethernet intelligent, packet-based networks that can efficiently and reliably handle massive amounts of bi-directional or even multi-directional data communications between various devices and locations.³⁵

It is also possible to use the Commission's decisions in respect of forbearance in regulating high-speed retail DNA service to infer the extent of investment by competitors. Further to Telecom Decision 2007-35, the Commission will forbear from regulating DNA rates in locations with 25 or more buildings connected to an incumbent TSP's and/or competitor's high-speed DNA-capable network within the wire centre serving area when a competitor's network presence is 30 percent or more of the wire centre's serving area.³⁶ The list of wire centres at which DNA high-speed access has been forborne further to Telecom Decisions 2007-35 and 2011-152 are shown in Figure 10. Thirty-one of these wire centres were subject to forbearance in Decision 2007-35, with a further ten wire centres subject to forbearance in Decision 2011-152. The ten more recently forborne wire centres are: Guelph, City View,

29 For more information on Telus' Ethernet services see:
http://partner.telus.com/en/products/connectivity/carrier_ethernet_services/.

30 For information on Rogers' Ethernet services to business, see: "Ethernet Services", Rogers Business Solutions, available at <http://business.rogers.com/pdf/Ethernet-Services.pdf>; <http://www.atrianetworks.com/news/rogers-communications-acquires-atria-networks-to-further-enhance-business-solutions-offering/>; Rogers Annual Report 2012, p. 15, accessed from www.rogers.com/cms/investor_relations/pdfs/2012_Annual-Report.pdf at <http://business.rogers.com/rbs-networks/?network=fibre>.

31 For information about MTS Allstream's Ethernet services, see: <http://www.allstream.com/products/ip-connectivity/switched-ethernet.html>; <http://www.allstream.com/about-us/news/allstream-connects-3000th-building-to-its-national-ip-fibre-network.html>; <http://www.allstream.com/about-us/ipnetwork/>.

32 <http://affaires.videotron.com/web/large-companies/ip-network/virtual-private-network/layer-2>.

33 <http://www.cogecodata.com/managedethernet/>; Canadian Business Journal, October 2012, p. 9, available from http://www.cbj.ca/brochures/2012/Oct/Cogeco_Business_Solutions/index.php.

34 "Cogeco Cable acquires Toronto Hydro Telecom Inc.", Cogeco Cable Inc., June 13, 2008.

35 <http://www.tccomm.com/Literature/default.aspx/Ethernet-Network-White-Papers/SONET-to-Ethernet-comparison>.

36 Telecom Decision CRTC 2007-35, at paragraph 106-107.

Cote-des-Neiges, Dudemaine, Papineau, Sauvé, St-Dominique, D'Aiguillon, Ste-Foy, and St-Réal.

Figure 10: Forborne Wire Centres for Retail DNA Access, DS-3, OC-3 and OC-12

Exchange	Wire Centres
Toronto	Adelaide, Simcoe, Asquith, Finch, Eglinton, Donlands
Ottawa-Hull	O'Connor, Bank, Vanier, Hull, Iona, Britannia, Rideau, Cityview
Montreal	Ontario, Belmont, Atwater, Cote-des-Neiges, Dudemaine, Papineau, Sauvé, St-Dominique
Hamilton	Hunter, Wentworth, Main, Lake
Cooksville	Burnhamthorpe, Dundas, Hurontario
Streetsville	Pearl
Kitchener	Water, Albert
Kanata-Stittsville	Kanata
Brampton	Walker, John
Stoney Creek	Stoney Creek
Clarkson	Clarkson
Guelph	Guelph
Quebec	D'Aiguillon, Ste-Foy, St-Réal

These forborne wire centres represent 53% of Bell's wholesale circuits.

As an additional measure of the extent of competing fibre networks, Bell determined the number of wholesale circuits that it gained associated with lost retail circuits since December 2011 for business customers. If Bell loses a retail circuit to a particular address but gains a wholesale circuit to the same address within six months, it is assumed that the competitor that won the retail circuit from Bell is using Bell infrastructure to provision the customer. This analysis indicates that Bell only gains a wholesale data circuit for a lost data retail circuit less than ten percent of the time. Thus, in the vast majority of circumstances where Bell loses a retail business circuit to a competitor, that competitor does not require Bell infrastructure to serve the business.

5.6 Claims of MTS Allstream in its Petition to Governor in Council

In 2009, MTS Allstream petitioned the Governor in Council ("GIC") to vary the Commission's Telecom Decision 2008-118 (Ethernet) and 2009-34 (ADSL). In its petition,

MTS Allstream claimed that the Commission's decision was based on failed notions about the most effective way to encourage investment in telecommunications facilities, and also that the Commission had erroneously applied its essential facilities test. MTS Allstream indicated that it would have to spend billions to duplicate existing local networks in Toronto and other major urban centres, since although the company was the first carrier in Canada to have a full Internet Protocol ("IP") backbone network, the Commission's decisions would discourage further investment because it would result in the imminent withdrawal of wholesale Ethernet services. Below, I consider some of the claims made by MTS Allstream.

MTS Allstream argued in its petition that the Commission's forbearance decision adversely affected competitors' incentives to invest in their own facilities. The company indicated that it has built a national backbone network in major metropolitan markets, including metropolitan POPs and fibre rings around the metropolitan areas as well as around city cores. It has also invested in co-location spaces within the central offices ("COs") of incumbent TSPs. However, MTS Allstream lacked certain Ethernet network components, which it wished to have made available for lease at cost-based rates on an unbundled basis. But with forbearance wholesale Ethernet services are offered only on an 'end-to-end' basis and consequently MTS Allstream argued that its self-supplied facilities could not be used in combination with incumbent TSPs' networks. The withdrawal of wholesale Ethernet services was alleged to discourage further investment and, if the Commission's decisions were not reversed, MTS Allstream argued that its investments would be stranded.

Notwithstanding these claims, Allstream has continued to invest substantially in its own network. MTS Allstream reported:

"In 2010, we are embarking on a program to extend fibre in markets where Allstream has a proven track record of success with the goal of increasing our on-net revenues and improving profitability. We plan to spend up to \$15 million to expand our Allstream IP network in 2010 in a very targeted manner selecting areas that will enable us to provide improved margin connectivity services to new and existing customers. The capital spending associated with this investment is success-based as determined by new customer wins."³⁷

Between the third quarter of 2012 and the third quarter of 2013, MTS Allstream increased the number of fibre-connected buildings in its network by 11.7% to 2,953.³⁸ MTS Allstream

³⁷ MTS Allstream 2009 Annual Report, at page 16.

³⁸ MTS Allstream Management's Discussion and Analysis Q3 2013, at page 13.

also added 335 buildings to its national fibre network in 2012.³⁹ More recently, on January 22, 2014, Allstream announced that it has now connected more than 3,000 buildings to its fibre-optic IP network, and the number of connected buildings has increased by 50% compared to three years ago, which is ahead of Allstream's plan. This expansion was pursuant to a "targeted multi-year investment program to increase its profitability."⁴⁰ Allstream plans to continue to make strategic investments to expand its network in 2014. As anticipated in the Commission's forbearance decision, Allstream's expanded footprint makes Allstream a stronger and more resilient service provider, now and well into the future. These investments suggest that MTS Allstream does not consider its investments to be stranded, notwithstanding the Commission's forbearance decisions.

With respect to investments generally, facilities-based alternative TSPs have increased their capital expenditures significantly since 2008, and their investments have substantially exceeded the pace of investments by incumbent TSPs within their territories as shown in Figure 11.

Figure 11: Telecommunications Capex, by type of TSP (\$billions)

	2008	2009	2010	2011	2012	CAGR 2008-2012
Incumbent TSPs (in-territory)	4.1	4.2	4.4	4.6	4.4	1.6%
Facilities-based TSPs	1.7	1.5	2.1	2.6	2.7	12.1%
<i>Incumbent TSPs as fraction of total</i>	<i>69%</i>	<i>74%</i>	<i>67%</i>	<i>64%</i>	<i>62%</i>	
<i>Facilities-based TSPs as fraction of total</i>	<i>29%</i>	<i>26%</i>	<i>32%</i>	<i>36%</i>	<i>38%</i>	

Source: 2013 Communications Monitoring Report, Table 5.1.6.

In addition to affecting investment incentives, MTS Allstream noted that forbearance would likely lead to higher prices for business services as had occurred following forbearance decisions in respect of retail services. This has not materialized, as is discussed further below.

5.7 State of Competition for Business Services Today

If the Commission's decision had the effect of substantially lessening competition, this would manifest itself in an increased share for incumbent TSPs and reduced share for alternative

³⁹ MTS Allstream 2012 Annual Report, at page 4.

⁴⁰ Allstream news release, "Allstream reaches milestone connecting 3,000th building to its national IP fibre network", at <http://www.allstream.com/about-us/news/allstream-connects-3000th-building-to-its-national-ip-fibre-network.html>.

TSPs as well as higher prices for business services in downstream markets. I consider the evidence in respect of both below, with comparisons made to how shares and prices for business data services have changed since the Commission's decision in 2008.

Figure 12 shows Bell's market shares for LAN and IP VPN, and for all advanced data services (LAN, IP VPN, DWDM, and NMS) using data from the NBI/Sone *Canadian Data Communications Services Market Report* for 2009 – 2013. Bell's market shares of revenues for the various services that use the forborne inputs have been declining since 2007.

Figure 12: Bell Canada Shares of Canadian Revenues

Bell (excluding Bell West) Share of Canadian Revenues							
	2007	2008	2009	2010	2011	2012	2013 (est.)
IP-VPN	34%	35%	33%	31%	29%	30%	30%
LAN	31%	32%	28%	26%	25%	26%	25%
Advanced services	46%	44%	41%	39%	38%	37%	37%

Turning to retail prices, if downstream markets were less competitive after forbearance, we should find that Bell has been charging higher retail prices and/or increasing its volumes as rival suppliers become less competitive. In fact, the opposite has occurred. As shown in Figure 13, between January 2011 and December 2013, Bell's ARPU for its business broadband service LAN EI⁴¹ has not changed materially. The number of users that Bell has sold this service to has fallen substantially over the same time period even as its price growth is flat, indicating that Bell's customers are migrating to other suppliers. Revenues earned by all suppliers of Ethernet services to business have been trending upwards since 2010, with market revenues increasing by 6% in 2011 over 2010, and by almost 1% in 2012,⁴² which, given Bell's declining number of users and flat prices, indicates that competitors have increased their share of Ethernet revenues sold to business relative to Bell.

⁴¹ This product accounted for 87% of Bell's revenues on all Broadband services to large customers in 2001 and 2013.

⁴² 2013 Communications Monitoring Report, table 5.4.2.

Figure 13: Bell's ARPU and Number of Users for LAN EI to Large Businesses

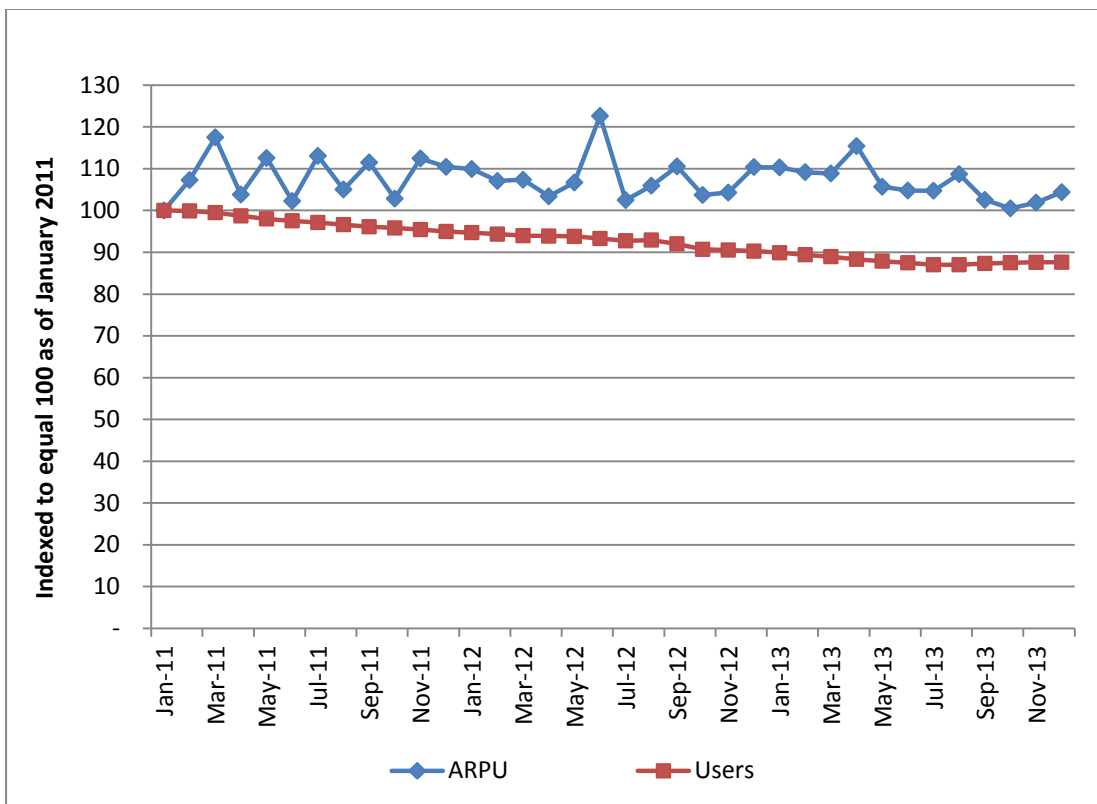
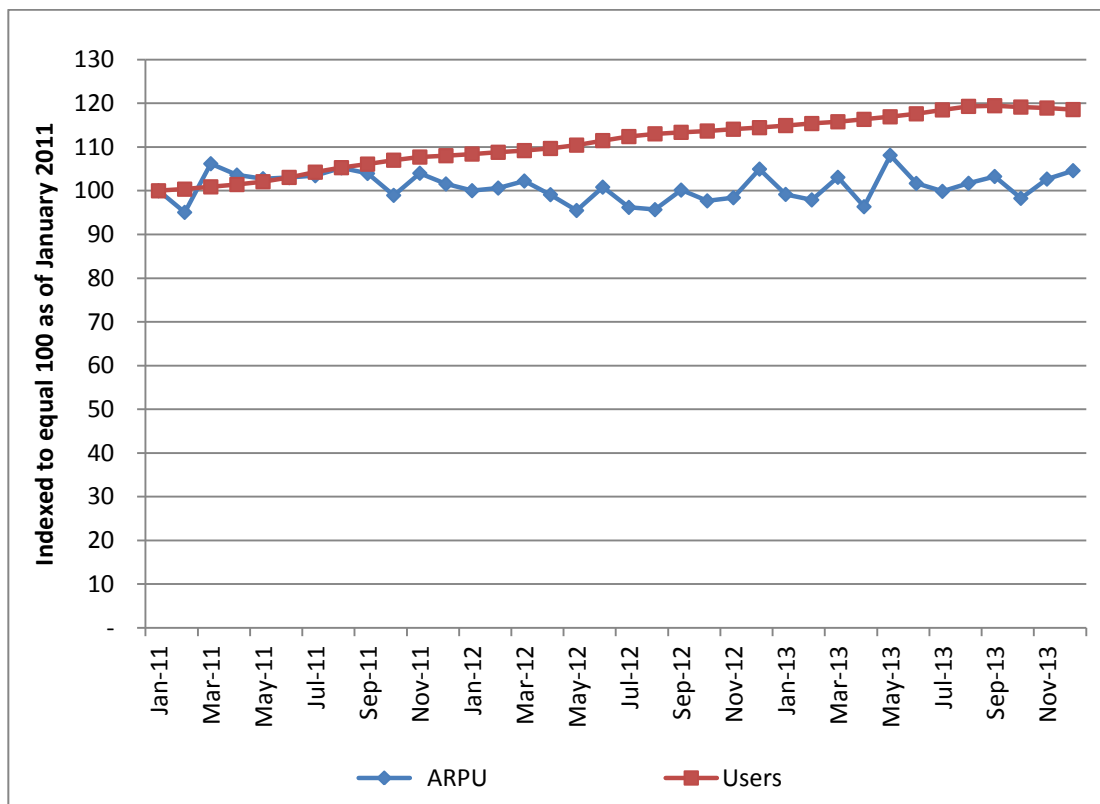


Figure 14 shows Bell's ARPU for IP VPN to large businesses over the same time period. As with LAN EI, Bell's price growth for this service has been flat, while the number of users has increased. The market for IP data protocol revenues has been trending upwards, with a 12.9% increase in annual revenues by all suppliers in 2011, and a 5.8% increase in revenues in 2012.⁴³ In comparison, Bell's annual revenues for IP VPN to large business increased 4.2% in 2012 and 7.6% in 2013, which indicates that competitors have at least maintained their revenue share in the supply of IP VPN to businesses relative to Bell.

43 2013 Communications Monitoring Report, table 5.4.2.

Figure 14: Bell's ARPU and Number of Users for IP VPN to Large Businesses



This analysis is consistent with the Commission's analysis of the market for new data protocols. The revenue share of in-territory incumbent TSPs remained relatively constant between 2008 and 2011: in 2008, in-territory incumbent TSPs' share was 53%, and in both 2011 and 2012 their share was 55%. Non-incumbent alternative TSPs have experienced a slight increase in their revenue market share over this period; their 2012 share of 29% is higher than in any other year since 2008.⁴⁴

6. Conclusion

Returning to the economic theory described earlier, if the Commission had erroneously misclassified wholesale Ethernet and CDN services as non-essential when in fact they were essential inputs that incumbent TSPs could use in a raising rivals' costs strategy in order to substantially lessen competition, the following should have taken place.

⁴⁴ 2013 Communications Monitoring Report, table 5.4.4.

First, rivals' marginal costs should have been increased by a significant amount following forbearance because they would have had little choice but to pay the higher prices for Ethernet and CDN services. This is not the case. While Bell increased prices for the forborne services, this did not lead to higher payments being made to Bell by wholesale customers of these services. Instead, using Bell's Intra service as an example, total payments to Bell fell indicating that wholesale customers were able to substitute alternative infrastructure for the forborne services.

Second, the costs that the incumbent incurs in order to raise its rivals' marginal costs must not exceed the increase in price (otherwise the incumbent is incurring losses and hence the theory reverts to one of economic predation). This condition is not met here because as just noted there has been little to suggest a material increase in rivals' marginal costs has occurred given the substitution opportunities that appear to have been exercised.

Third, conditions within the downstream market must be such that the increase in price by the incumbent firm is sustainable (e.g., entry barriers are high and demand is sufficiently inelastic). Here there is no evidence of an increasing share for Bell in the downstream retail markets, and no evidence of increased prices for the retail business services for which the forborne services are typical inputs.

In conclusion, the Commission's decision in 2008 was correct and remains so today. Ethernet services, CDN access at speeds of DS-3, OC-3 and OC-12, and CDN transport at speeds of DS-0, DS-1, DS-3, OC-3 and OC-12 are non-essential. These services do not need to be supplied by incumbent TSPs to their rivals at regulated prices in order for effective competition to exist in respect of business services.