



Telecom Regulatory Policy CRTC 2010-632

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Ottawa, 30 August 2010

Wholesale high-speed access services proceeding

File numbers: 8663-C12-200907321, 8661-C122-200904286, and 8638-C12-200905010

The Commission's determinations in this decision are the result of a comprehensive public proceeding launched on 8 May 2009. It was initiated to consider whether incumbent local exchange carriers (ILECs) and cable carriers should be required to offer certain high-speed access facilities as new wholesale services to competitors, for use when competitors provide their Internet services to consumers.

The Commission expanded the scope of this proceeding to include matters raised by the Governor in Council when it directed the Commission to review its determinations in earlier "speed-matching" decisions. In those decisions, the Commission required the ILECs to make their existing high-speed access services available to competitors at speeds that match all of the speed options the ILECs offer their retail Internet service customers (speed matching).

Consequently, the Commission considered regulatory approaches to provide incentives for continued investment in new network infrastructure and to maintain a sufficient level of competition to protect consumers. While considering the best approach, the Commission also took into account the need to ensure that wholesale service obligations for ILECs and cable carriers are equitable, and that they do not unduly impair the ILECs' abilities to offer new converged services such as Internet Protocol television (IPTV).

The Commission has made its determinations in this decision in accordance with the Telecommunications Act, and the Governor in Council's 2006 Policy Direction¹ and Order in Council 2009-2007.

Reconsideration of the speed-matching requirement

Competition drives innovation and provides consumers with a choice of service providers and service characteristics. The Commission notes that ILECs and cable carriers are offering their retail Internet services at increasingly higher speeds. The Commission considers that, at present, retail Internet service competition results primarily from services provisioned using wireline facilities. Other retail Internet services, such as those offered using wireless and satellite facilities, are not generally substitutes for wireline facilities at this time.

¹ Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives, P.C. 2006-1534, 14 December 2006 (the Policy Direction).

The Commission therefore finds that, at present, there is a continued need to require ILECs and cable carriers to make their existing wholesale high-speed access services – aggregated asymmetric digital subscriber (ADSL) access service and third-party Internet access (TPIA) service, respectively – available subject to a speed-matching requirement. Otherwise, in the Commission’s view, retail Internet service competition would not be sufficient to protect consumers’ interests.

More specifically, the Commission concludes that ILECs are to provide their existing wholesale high-speed access services to competitors at speeds that match all speed options the ILECs offer to their own retail Internet service customers. However, the Commission recognizes that significant up-front investment is required to construct the facilities ILECs use to provision new higher speed wholesale service options. Therefore, rates for these new higher speed wholesale service options will include, in addition to the markup on costs that would otherwise be used, a supplementary markup of 10 percent.

The Commission considers that the current rates for the cable carriers’ wholesale high-speed access services appropriately recognize investments made to upgrade their networks.

Given the adjustment to the ILECs’ wholesale service rates for new higher speed service options, the Commission considers that a speed-matching requirement would not result in an undue disincentive for ILECs to continue to invest in fibre-to-the-node facilities. It also considers that, in light of its determinations in this decision, such a requirement would not unduly impair the ILECs’ abilities to offer new converged services such as IPTV.

The Commission expects that at a future date, competition among wireline-, wireless-, and satellite-based retail Internet service providers will be sufficient to protect consumers’ interests. At that time, the Commission will apply its essential services framework to the ILECs’ aggregated ADSL access services and the cable carriers’ TPIA services to determine whether they should no longer be mandated.

Equity of wholesale access service obligations

The Commission has also assessed whether the relevant wholesale access service obligations for ILECs and cable carriers are equitable. Regarding the equity of the speed-matching requirement between ILECs and cable carriers, the Commission notes that cable carriers are also subject to a speed-matching requirement for their existing wholesale high-speed access services that allow competitors to provide retail Internet services.

However, the Commission concludes that changes to the cable carriers’ wholesale high-speed access services are required to make the ILECs’ and cable carriers’ obligations more equitable. These changes include providing increased levels of service aggregation for competitors.

New wholesale access services

The Commission is not persuaded that the ILECs and cable carriers should provide new wholesale access services – in the case of the ILECs, an ADSL access service located at the central office, and in the case of the cable carriers, a local head-end-based cable access service. In the Commission’s view, there is no convincing evidence to indicate that there would be a substantial lessening of competition in the absence of these services.

Access to new Internet access infrastructure

The ILECs and cable carriers are upgrading their networks and extending their fibre facilities closer to homes and businesses to provide higher retail Internet service speeds and converged services such as IPTV.

Parties in this proceeding expressed different views about what should be considered as next generation Internet access infrastructure and whether, and if so how, such infrastructure should be made available to competitors through wholesale services. The Commission finds no utility in defining what facilities should be identified as “next generation.” The Commission will apply its existing essential services regulatory framework to any application requesting that ILECs and cable carriers make these facilities available for competitor use.

The opinion of Commissioner Denton, dissenting in part, is attached.

Introduction

1. Until the early 1990s, telecommunications services in Canada were provided almost exclusively by telephone companies that operated on a monopoly basis within their serving territories, with one company providing regulated services to an area within a province using copper wire facilities.
2. The Canadian telecommunications landscape began to change in the early 1990s as other companies that wished to provide competitive telecommunications services emerged. Telecommunications technology also began to evolve more rapidly.
3. During the 1990s, in a series of decisions, the Commission opened various regulated telecommunications markets to competition, including the public long distance voice market in 1992 and the local residential voice market in 1997.²
4. When doing so, the Commission established regulatory frameworks that were designed to create an environment for sustainable competition. The Commission required, as part of its approach to fostering competition in various retail telecommunications markets, that the former monopoly telephone companies – now referred to as “incumbent local exchange carriers,” or ILECs – make certain telecommunications facilities available as regulated services for competitors to use

² See, for example, Telecom Decisions 90-3, 92-12, and 97-8.

as “inputs” in the provision of their own retail services.³ Today, these required services are called wholesale services.

5. When, in the late 1990s, the Internet became increasingly accessible to consumers, service providers generally used low-speed dial-up services to provide access to the Internet. By the end of the decade, both the major ILECs and the cable carriers (collectively, the incumbents)⁴ had implemented technologies to support high-speed Internet access on their networks. The ILECs implemented asymmetric digital subscriber line (ADSL) technology for use with their copper or hybrid copper-fibre facilities, and the cable carriers implemented DOCSIS⁵ technology for use with their hybrid fibre-coaxial cable facilities. The incumbents continue to use these technologies, upgraded as a result of further technological developments, to provision their retail Internet services to consumers at various service speed⁶ options and prices.
6. As a result of various decisions the Commission issued in the late 1990s, in which it found that competition in retail Internet services was sufficient to protect the interests of users, the incumbents, like their competitors, are not required to obtain prior Commission approval when they provide these retail services.⁷
7. When the Commission made these decisions, competitive retail Internet service providers were able to provide their services on a dial-up basis, using the customer’s retail telephone service. Therefore, they did not need to use the incumbents’ facilities on a wholesale service basis. As the retail Internet service market began to evolve to higher speed retail Internet services, to ensure these services remained subject to competition sufficient to protect consumers’ interests, the Commission required that the ILECs and cable carriers make some of their high-speed access facilities available as wholesale services for competitors to use as inputs in the provision of retail Internet services.⁸

³ An input is a service, product, or functionality used to provide a service.

⁴ In this decision, the term “major ILECs” refers to Bell Aliant Regional Communications, Limited Partnership, Bell Canada, MTS Allstream Inc., Saskatchewan Telecommunications, and TELUS Communications Company. The term “ILECs” generally refers to these companies, as well as Télébec, Limited Partnership (Télébec). In this decision, the term “cable carriers” refers to Bragg Communications Inc., carrying on business as EastLink (Bragg), Cogeco Cable Canada Inc., Rogers Cable Communications Inc., Shaw Communications Inc., and Videotron Ltd.

⁵ DOCSIS is an acronym for Data Over Cable Service Interface Specification, which is a telecommunications standard that defines interface requirements involved in high-speed data delivery over cable carriers’ hybrid fibre-coaxial facilities.

⁶ Service speeds are defined in terms of the amount of data that can be sent to the end-user from the Internet in a second (typically specified in terms of megabits per second transfer rate) and the amount of data that an end-user can send to an Internet site in a second.

⁷ See, for example, Telecom Decision 98-9 and Telecom Order 99-592. Subsection 34(2) of the *Telecommunications Act* provides that where the Commission finds that a service is or will be subject to competition sufficient to protect the interests of users, it shall refrain to the extent it considers it appropriate and either conditionally or unconditionally from the performance of specific duties set out in that Act.

⁸ See, for example, Telecom Decisions 98-9 and 99-8, and Telecom Orders 2005-62 and 2006-17.

8. The wholesale services under consideration in this decision are, in the case of the ILECs, aggregated ADSL access service and, in the case of the cable carriers, third-party Internet access (TPIA) service. Both services provide two network elements to a competitor: (a) access facilities between an end-user's premises and the carrier's network, and (b) transport facilities between the carrier's network and an interconnection point that links the carrier's and the competitor's facilities.⁹
9. Over the past few years, the incumbents' retail Internet service speeds have become faster as consumers expect higher speed access to an ever-expanding range of Internet services. Incumbents have been able to provide higher speeds by constructing more fibre facilities in their access networks to bring these facilities closer to their customers' premises.¹⁰

The Commission's speed-matching decisions

10. In various decisions issued in 2006 and 2007, the Commission required Bell Aliant Regional Communications, Limited Partnership (Bell Aliant), Bell Canada, MTS Allstream Inc. (MTS Allstream), Saskatchewan Telecommunications (SaskTel), and TELUS Communications Company (TCC); and Cogeco Cable Canada Inc. (Cogeco), Rogers Cable Communications Inc. (RCCI), Shaw Communications Inc. (Shaw), and Videotron Ltd. (Videotron) to make their aggregated ADSL access and TPIA services available to competitors at speeds that match the speeds they offer to their retail Internet service customers (the speed-matching requirement).¹¹
11. In 2007, following an application by Bell Aliant, Bell Canada, SaskTel, and TCC, the Commission rescinded the speed-matching requirement as it applied to those ILECs, given the uncertainty regarding the regulatory framework for wholesale services arising from a proceeding, then underway, to review the regulation of wholesale services. In March 2008, that proceeding resulted in Telecom Decision 2008-17 (the essential services decision), which set out the regulatory framework for wholesale services (the essential services framework) as described below.
12. After the Commission had rescinded the speed-matching requirement, Bell Aliant, Bell Canada, and TCC limited the maximum speeds available to competitors for

⁹ Aggregated ADSL access service establishes a single interconnection point in the ILEC's network that provides competitors with high-speed access paths to all of the ILEC's end-user premises throughout its operating territory, which is often a province. TPIA service establishes multiple interconnection points in the cable carrier's network, with each interconnection point providing competitors with high-speed access paths to the cable carrier's end-user premises within authorized service areas, which vary significantly in extent among the cable carriers.

¹⁰ By extending fibre facilities further into the access network, the ILECs are able to shorten the copper loop segment that terminates at a customer's premises and, by doing so, increase the maximum service speed that can be provided on the loop using digital subscriber line (DSL) technologies – the shorter the loop, the higher the maximum potential service speed.

¹¹ For the major ILECs, see Telecom Orders 2007-21 to 2007-25. For the cable carriers, see Telecom Decision 2006-77. Bragg is not subject to the Commission's speed-matching requirement at this time.

aggregated ADSL services to levels below those offered to their retail Internet service customers.

13. In June 2008, Cybersurf Corp. (Cybersurf), a competitor, requested that the Commission reinstate the speed-matching requirement for all ILECs. As a result of the proceeding initiated by Cybersurf's application, the Commission issued Telecom Decision 2008-117, in which it directed Bell Aliant, Bell Canada, MTS Allstream, SaskTel, and TCC to provide speed matching for their respective aggregated ADSL access services.
14. On 3 March 2009, in response to a further application by Cybersurf, the Commission issued Telecom Order 2009-111, which clarified that the speed-matching requirement in Telecom Decision 2008-117 applied to aggregated ADSL access service speeds provisioned using hybrid copper-fibre facilities and directed the major ILECs to comply with the requirements of that order. In this decision, Telecom Decision 2008-117 and Telecom Order 2009-111 are referred to as "the speed-matching decisions."
15. On 11 March 2009, Bell Aliant, Bell Canada, and TCC petitioned the Governor in Council to reverse the Commission's speed-matching decisions.

The current proceeding

16. On 10 December 2009, the Governor in Council issued Order in Council P.C. 2009-2007 (the Order in Council). The Order in Council directed the Commission to reconsider its determinations in the speed-matching decisions that (a) ILECs must provide their aggregated ADSL access services at speeds that match the speeds they provide for their retail Internet services, and (b) the speed-matching requirement is not limited to the ILECs' end-to-end copper access facilities, and includes aggregated ADSL access services provisioned using hybrid copper-fibre facilities.
17. The Order in Council directed that the Commission specifically consider whether
 - (a) the speed-matching requirements unduly diminish the incentives to invest in new network infrastructure in general and, in particular, in markets of different sizes;
 - (b) in the absence of the speed-matching requirements there would be sufficient competition to protect the interests of users;
 - (c) the respective wholesale obligations imposed on incumbent telephone and cable companies are equitable or represent a competitive disadvantage; and
 - (d) the impact of these wholesale requirements unduly impairs the ability of incumbent telephone companies to offer new converged services, such as Internet Protocol television (IPTV).

18. At the time the Order in Council was issued, the Commission was conducting the proceeding that has resulted in this decision. The Commission initiated this proceeding in Telecom Notice of Consultation 2009-261 to examine the appropriateness of requiring the ILECs and the cable carriers to offer new wholesale services that would make their high-speed access facilities available for competitor use, without associated transport facilities. These services would be, for the ILECs, a central office (CO)-based ADSL access service¹² and, for the cable carriers, a local head-end-based cable access service.^{13 14}
19. After receiving the Order in Council, the Commission expanded the scope of the proceeding initiated by Telecom Notice of Consultation 2009-261 to include matters arising from the Order in Council and to consider whether mandatory wholesale access to new types of Internet access infrastructure would unduly diminish incentives to invest in new network infrastructure.
20. The ILECs, the cable carriers, competitors – including associations of Internet service providers (the ISPs),¹⁵ and consumer groups participated in this proceeding. The Commission also received comments from members of the public. The public record of this proceeding, which closed on 21 June 2010, is available on the Commission’s website at www.crtc.gc.ca under “Public Proceedings” or by using the file numbers provided at the beginning of this decision.

Public policy considerations

21. The Order in Council states that the continued development and availability of broadband Internet infrastructure and services is important for Canadians and the

¹² CO-based ADSL access service is a proposed ILEC service for competitors that would provide high-speed access between an end-user’s premises and an ILEC’s central office (CO), where traffic would be exchanged between the end-user and the competitor at an interconnection point. The service would allow a co-located competitor to access all of its high-speed access end-customers that are served by a particular CO through a single interconnection point at the CO. The competitor would be responsible for co-location or third-party co-location arrangements and for transport facilities to carry its end-customer traffic between the CO and the competitor’s own network.

¹³ Local head-end-based cable access service is a proposed cable carrier service for competitors that would provide high-speed access between an end-user’s premises and a local cable head-end, where traffic would be exchanged between the end-user and the competitor at an interconnection point. The service would allow a competitor to access all of its high-speed access end-customers served by a particular head-end through a single interconnection point at the head-end. The competitor would be responsible for building or arranging for transport facilities to the head-end to carry its end-customer traffic between the head-end and its own network.

¹⁴ The Commission had initiated a proceeding in Telecom Regulatory Policy 2009-34 to examine the feasibility, configuration, and classification of a CO-based ADSL access service. The Commission subsequently received an application by Cybersurf requesting that cable carriers be required to provide the service referred to in this decision as a local head-end-based cable access service. The CO-based ADSL access proceeding and the local head-end-based cable access proceeding were combined into a single proceeding in Telecom Notice of Consultation 2009-261, to which this decision responds.

¹⁵ Competitors included individual ISPs, such as Cybersurf, Distributel Communications Limited (Distributel), Execulink Telecom Inc. (Execulink), Primus Telecommunications Canada Inc. (Primus), and TekSavvy Solutions Inc. (TekSavvy), as well as the following associations of Internet service providers: the British Columbia Broadband Association, the Canadian Association of Internet Providers, Open Source Solutions, and the Coalition of Internet Service Providers Inc.

Canadian economy. It also notes that it is critical that the regulatory regime provide a cohesive, forward-looking framework that provides the proper incentives for continued investment in broadband infrastructure, encourages competition and innovation, and leads to consumer choice.

22. The Commission considers that competition in retail service markets drives innovation and provides end-users with the greatest choice of service providers and service characteristics, including pricing, service features, and customer service quality. The Commission has recently noted that the rapidly developing array of Internet services and applications represents extraordinary advances. It has also noted that information and communications technologies support education, health care, and cultural activities; foster communities; and facilitate trade and commerce.¹⁶

The essential services framework

23. The Commission has indicated its intention to apply its essential services framework for wholesale services in this proceeding on a forward-looking basis to provide appropriate incentives for continued investment in broadband infrastructure, encourage competition and innovation, and expand consumer choice.
24. The essential services framework adopted by the Commission in the essential services decision revised the definition of an essential service. When considering whether a potential wholesale service should be mandated, the Commission applies the following definition of an essential service:

To be essential, a facility, function, or service must satisfy all of the following conditions:

- (i) The facility is required as an input by competitors to provide telecommunications services in a relevant downstream [retail] market;
 - (ii) The facility is controlled by a firm¹⁷ that possesses upstream [wholesale] market power such that *denying* 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.
25. The essential services framework also restructured the previous regulatory framework for wholesale services by establishing six categories of wholesale services. Each existing wholesale service was assigned to one of the six service

¹⁶ See Telecom Regulatory Policy 2009-657, in which the Commission established its regulatory framework for Internet traffic management practices. These practices are the technological and economic means by which carriers manage the Internet traffic carried on their networks.

¹⁷ In the context of this definition, the term “firm” includes a group of firms exercising joint dominance.

categories,¹⁸ with the ILECs' aggregated ADSL access services and the cable carriers' TPIA services being assigned to the conditional mandated non-essential¹⁹ wholesale service category. Rates for these services are determined on the basis of service costs to the ILEC or cable carrier plus a markup on these costs.

26. In this decision, the Commission has applied the essential services framework on a forward-looking basis and has made its determinations in accordance with the *Telecommunications Act* (the Act), including subsection 27(2), and with a view to implementing the policy objectives in section 7 of the Act, particularly paragraphs 7 (a), (b), (c), (f), and (h). It has also made its determinations in accordance with the Governor in Council's Order in Council and Policy Direction.²⁰
27. The Policy Direction requires the Commission to implement the Canadian policy objectives in section 7 of the Act in accordance with specific terms and criteria. These include relying on market forces to the maximum extent feasible and ensuring that any technical regulatory measures are implemented in a technologically and competitively neutral manner to the greatest extent possible.

Issues

28. The Commission has identified the following issues to be addressed in its determinations:
 - A. Reconsideration of the speed-matching requirement for aggregated ADSL access services
 - I. The effect of the speed-matching requirement on incentives to invest in new network infrastructure
 - II. Sufficiency of competition in the absence of speed matching
 - III. Equity of the speed-matching requirement for ILECs and cable carriers
 - IV. The effect of the speed-matching requirement on the ILECs' abilities to offer new converged services, such as IPTV
 - B. Equity of existing wholesale access service obligations between the ILECs and the cable carriers

¹⁸ The six wholesale service categories established in the essential services decision are: essential, conditional essential, conditional mandated non-essential, public good, interconnection, and non-essential subject to phase-out.

¹⁹ Services in the conditional mandated non-essential category are those that do not meet the criteria for essential services but continue to be mandated for certain reasons. Changes in market conditions at a point in the future could result in it no longer being necessary to mandate any or all of these services. The existing classification of these services will continue until it is demonstrated in an application that the reasons for mandating these services are no longer present.

²⁰ *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives*, P.C. 2006-1534, 14 December 2006 (the Policy Direction).

- C. Access to new Internet access infrastructure
- D. CO-based ADSL access service from the ILECs and local head-end-based cable access service from the cable carriers

A. Reconsideration of the speed-matching requirement for aggregated ADSL access services

- 29. The term “speed matching” refers to a regulatory requirement that ILECs and cable carriers provide wholesale services that enable competitors to offer Internet services to their retail customers at speeds that match the Internet speeds provided by those incumbents to their own retail customers. In previous decisions and orders, the Commission determined that speed matching applies to both cable carriers’ TPIA services and to ILECs’ aggregated ADSL services.²¹ The Order in Council directed the Commission to reconsider the speed-matching decisions.
- 30. At issue in this proceeding, therefore, is reconsideration of the speed-matching requirement that applies to the ILECs’ aggregated ADSL services and, in particular, reconsideration of the requirement as it would apply to higher speed aggregated ADSL access service options that would be provided using fibre-to-the-node (FTTN) facilities.²²
- 31. The Commission notes that for the purposes of this decision, references to ADSL include all technologies that can be supported on FTTN facilities, including ADSL2, ADSL2+, very-high-bit-rate DSL (VDSL), and VDSL2.

I. The effect of the speed-matching requirement on incentives to invest in new network infrastructure

Positions of parties

- 32. Bell Aliant, Bell Canada, and Télébec (Bell Canada et al.) and TCC submitted that a speed-matching requirement for aggregated ADSL access service that requires the provision of this wholesale service using their FTTN facilities would be a disincentive for them to invest further in these facilities. They also submitted that the amount of up-front capital required to build FTTN facilities is substantial and that such investment carries greater financial risk than alternative investments.

²¹ In the case of the cable carriers’ TPIA services, the Commission’s most recent determinations regarding speed matching are set out in Telecom Decision 2006-77. In the case of the ILECs’ aggregated ADSL access services, the Commission’s most recent determinations are set out in the speed-matching decisions.

²² The ILECs are upgrading their networks and extending fibre facilities closer to homes and businesses. In this decision, these facilities are referred to as FTTN facilities. The ILECs use FTTN facilities in conjunction with their legacy copper facilities to provide increasingly higher retail Internet service speeds and IPTV.

33. TCC further submitted that, following the issuance of the essential services decision on 3 March 2008, the Commission should not require the provision of new wholesale Internet access services or service requirements, but instead should forbear from regulating any such services or requirements.
34. Bell Canada et al. and TCC also submitted that investment in FTTN facilities is justified only by multi-product revenues – from retail Internet service, IPTV, and telephony. In their view, if a speed-matching requirement were applied to wholesale services provisioned using FTTN facilities, revenues would be reduced. This would occur because end-users would be purchasing high-speed retail Internet service from competitors that use aggregated ADSL access service to provision their retail services, and also because the ILECs would have decreased revenues from IPTV service and service bundles.²³ They further submitted that investment incentives would be reduced in all markets, regardless of size, for any broadband infrastructure subject to wholesale service requirements.
35. Bell Canada submitted internal investment studies based on its current plans to deploy FTTN in three cities. These studies included investments in FTTN facilities, and 10-year revenue and cost projections associated with various retail services and wholesale aggregated ADSL access services. These investment studies indicate that the rate of return required to justify the planned FTTN investment (hurdle rate)²⁴ would not be achieved with a speed-matching requirement for aggregated ADSL access service and, therefore, the FTTN investments would not be economically viable.
36. While maintaining their view that a speed-matching requirement would not be appropriate, at the request of the Commission Bell Canada et al. identified and described measures to recognize the very large investment associated with FTTN facility construction, for which they argued they should be compensated. One measure they proposed was to use a higher cost of capital than would otherwise be used when establishing tariffed aggregated ADSL access service rates based on Phase II costs.²⁵ Another measure they proposed was to apply a one-time charge for each end-user served by a competitor.
37. SaskTel submitted that it already provides aggregated ADSL access service to wholesale customers at the highest speeds available to its retail Internet service customers and that there would be no effect on the company's planned capital

²³ Bell Canada et al. considered a complete service bundle to be a package of telephony, Internet, and IPTV services.

²⁴ An investment project is deemed to be economically viable if the return on investment exceeds a required minimum return, or hurdle rate. Bell Canada submitted its hurdle rate in confidence.

²⁵ Tariffed wholesale service rates are typically based on the incumbent carrier's service costs plus a markup. The incumbent carrier typically files a cost study in support of wholesale service rates it proposes. In that cost study, which includes a cost of capital, the carrier uses incremental economic costs to estimate service costs. These costs are referred to as "Phase II costs" (for historical reasons) and, for ILECs, are assessed using methodologies set out in Phase II costing manuals that the Commission has approved. After costs are assessed, a markup (expressed in percentage terms) is then added to costs to establish the rate for the service.

expenditures if the Commission were to mandate speed matching for wholesale aggregated ADSL access services. MTS Allstream submitted that its decisions about investment in new types of Internet access infrastructure are driven by competitive necessity.

38. The cable carriers generally submitted that their investments in Internet infrastructure are driven by market opportunity and intense retail service competition from the ILECs. They also submitted that both they and the ILECs have been building fibre in their networks closer to homes and business premises for at least a decade, and that cable carrier investments that take full advantage of DOCSIS 3.0 functionality²⁶ are substantial and ongoing.
39. The cable carriers submitted, further, that Bell Canada et al.'s real concern is the rates that they could charge for speed-matched aggregated ADSL access services and that, if speed matching were required, the conditional mandated non-essential wholesale service classification of aggregated ADSL access and TPIA services would provide sufficient pricing flexibility to adopt appropriate rates.
40. Competitors and the Public Interest Advocacy Centre on behalf of the Consumers' Association of Canada and Canada Without Poverty (the consumer groups) generally submitted that requiring speed matching or mandating access to new types of Internet access infrastructure would not diminish ILEC incentives to invest in new network infrastructure, in general or in markets of different sizes, particularly if ILECs are to remain competitive with cable carriers. TekSavvy Solutions Inc. (TekSavvy) submitted that despite regulatory uncertainty, Bell Canada et al. are accelerating the rollout of their FTTN facilities.

Commission's analysis and determinations

41. With respect to TCC's position that the Commission should not require the ILECs to offer additional wholesale Internet access services or service requirements after the date of the essential services decision, the Commission notes that the decision itself contains no such limitation and, for the reasons set out below, considers that any such limitation would not be appropriate.
42. The Commission notes the views of certain parties that requiring speed matching for aggregated ADSL access service options provisioned using FTTN facilities would not create a disincentive to invest, that ILECs continue to have incentive to invest in FTTN facilities to remain competitive with cable carriers, and that ILECs have invested widely in such facilities despite the Commission's previous determinations to require speed matching.
43. The Commission also notes, however, the position of Bell Canada et al. and TCC that a very large amount of up-front capital is required for ILECs to construct FTTN facilities on a widespread basis. The Commission considers that the investment risk

²⁶ DOCSIS 3.0 is a version of the DOCSIS standard that allows for multiple channels to be bonded in order to provision significantly increased speeds to customers.

associated with construction of these facilities to serve residential and business Internet markets is greater than, and distinguishable from, risk associated with other ILEC facilities.

44. In the Commission's view, if it were to conclude that speed matching for the ILECs' aggregated ADSL access services should be required, it is reasonable that tariffed rates for new higher speed aggregated ADSL access service options (speed-matching rates) should recognize a higher cost of capital than would otherwise be the case. The Commission notes that the ILECs' costs of capital that would otherwise be used to establish these speed-matching rates are significantly lower than the cable carriers' costs of capital used to establish TPIA service rates.
45. The Commission has paid considerable attention to Bell Canada's investment studies and considers that it would be appropriate for the ILECs to use a higher cost of capital, which would be comparable to the hurdle rate Bell Canada used in its internal FTTN investment studies, in the Phase II cost studies of the ILECs for speed-matching rates.²⁷ The Commission considers that for tariff purposes, the simplest approach for recognizing this higher cost of capital would be to increase the markup applied to Phase II costs when establishing rates for the new higher speed aggregated ADSL service options. In the Commission's view, an additional markup of 10 percent for each ILEC on the Phase II costs used to establish these speed-matching rates would be appropriate.
46. In light of the above, in its reconsideration of a speed-matching decisions, the Commission concludes that with approved rates that reflect an additional markup of 10 percent on Phase II costs, a speed-matching requirement for the ILECs' new higher speed aggregated ADSL access service options would not result in an undue disincentive for ILECs to continue to invest in FTTN facilities. The Commission notes that this additional 10 percent markup on service costs is over and above the markup that would be applied to the ILECs' new higher speed aggregated ADSL access service options. The Commission further notes that if it concluded that speed matching should be required and rates were established on the basis set out above, the effective cost of capital used to establish both the ILECs' speed-matching rates and the cable carriers' TPIA service rates would be comparable.
47. The Commission notes that the ILECs did not demonstrate that the effect of a speed-matching requirement would vary by market location or size. Accordingly, the Commission's findings in this section apply in the ILECs' in-territory markets, regardless of size.

²⁷ A review of proposed speed-matching tariffed rates based on a cost of capital that is higher than that traditionally used for Phase II costing purposes would involve a review of each ILEC's capital structure (the mix of debt, and common and preferred equity issued by the company to finance its business). It would also involve a review of the company's cost of debt, and its cost of common and preferred equity. The Commission considers that Bell Canada et al.'s alternative proposal to apply a one-time charge for each end-user served by a competitor using their aggregated ADSL access service would raise additional considerations to be addressed. For example, the charge could be paid more than once if an end-user changes service providers.

II. Sufficiency of competition in the absence of speed matching

Positions of parties

48. All incumbents except MTS Allstream argued that additional wholesale obligations are neither necessary nor appropriate because competition in the retail Internet services market from facilities-based service providers is sufficient to protect the interests of end-users in most geographic areas. They submitted that end-users can choose between services offered both by the incumbents and their competitors. These parties also submitted that retail Internet services provisioned using wireless and satellite facilities are available to end-users on a scale sufficient to protect their interests. The incumbents also generally submitted that the competitive offerings of their counterparts promote vigorous competition in the retail high-speed Internet market.
49. The competitors, MTS Allstream, and the consumer groups submitted that the retail Internet service market is effectively an ILEC and cable carrier duopoly. In their view, retail wireless- and satellite-based Internet services do not offer end-users competitive prices or an experience comparable to Internet services provisioned using wireline facilities. These parties also generally submitted that without appropriate speed matching for wholesale services, competitive service providers would find it increasingly difficult to compete with the incumbents' Internet services as end-users' demand for higher service speeds continues to increase.

Commission's analysis and determinations

50. The Commission notes that it has previously determined²⁸ that the retail Internet service market is sufficiently competitive to protect the interests of users and that it forbore from regulating retail Internet services for this reason.²⁹ The retail residential and small-to-medium-sized business Internet service markets are now served by the incumbents and a number of smaller competitors that generally use the incumbents' wholesale services to do so.³⁰ In the Commission's view, these competitors' services bring pricing discipline, innovation, and consumer choice to these retail Internet service markets.
51. The Commission notes the incumbents' submissions that retail Internet services provisioned using wireless and satellite facilities are substitutes for retail Internet services provisioned using wireline facilities. The Commission also notes that wireless- and satellite-based retail Internet services have extensive coverage areas.

²⁸ See, for example, Telecom Order 99-592.

²⁹ The Commission forbore from regulating retail Internet services pursuant to section 34 of the Act, while retaining its powers under section 24 (in part) and subsection 27(2), among other sections.

³⁰ The retail multi-line business Internet service market was not a focus of this proceeding because the ILECs' wholesale ADSL access services are not generally used to provide services to large business customers and incumbent cable carriers have a limited footprint in this market.

52. In the Commission's view, however, the pricing considerations and capacity limitations associated with retail Internet services provisioned using wireless and satellite facilities make them less attractive as large-scale substitutes for wireline retail Internet services in geographic areas where these wireline services are available. The Commission notes, for example, that current prices for wireless- and satellite-based retail Internet services generally significantly exceed wireline retail Internet service prices for comparable service and that speed issues can occur as those systems' capacities are approached.
53. As a result, the Commission considers that, at this time, retail Internet services provisioned using wireless and satellite facilities generally remain complements to, and not substitutes for, retail Internet services provisioned using wireline facilities.
54. The Commission notes the significant extent to which competitors use existing wireline wholesale services to provision their retail Internet services. The Commission also notes that the incumbents are offering increasingly higher retail Internet service speeds to consumers. In the Commission's view, if speed matching were not required for both the ILECs' aggregated ADSL access services and the cable carriers' TPIA services, competitors would be effectively prevented from offering higher service speed options to their own customers.
55. The Commission concludes that, without a speed-matching requirement for wireline aggregated ADSL access and TPIA services, it is likely that competition in retail Internet service markets would be unduly impaired. In the Commission's view, an ILEC and cable carrier duopoly would likely occur in the retail residential Internet service market, and competition might be reduced substantially in small-to-medium-sized retail business Internet service markets. The Commission considers that, in such circumstances, retail Internet service competition would not continue to be sufficient to protect consumers' interests.
56. The Commission notes, however, that it expects that as technologies and retail Internet service markets evolve, retail Internet services provisioned using wireless and satellite facilities are likely to become substitutes for those provisioned using wireline facilities.
57. In the essential services decision, the Commission assigned both aggregated ADSL access and TPIA services to the conditional mandated non-essential wholesale service category to ensure continued competition in retail Internet service markets. In that decision, the Commission found that this classification would continue until it is demonstrated that a functionally equivalent, practical, and feasible wholesale alternative exists for these services.
58. Therefore, aggregated ADSL access and TPIA services will eventually be phased out, either when there is a wholesale alternative available as described in the essential services decision, or when retail Internet service competition among wireline-, wireless-, and satellite-based retail Internet service providers is sufficient to protect the interests of end-users in these retail markets, absent wholesale services.

III. Equity of the speed-matching requirement for ILECs and cable carriers

Positions of parties

59. All parties generally expressed support for the principle of symmetry for the ILECs' and cable carriers' regulatory obligations. Bell Canada et al. submitted that considerations of equity and symmetry would be better served if cable carriers were relieved from any speed-matching requirements for retail Internet services that require the DOCSIS 3.0 platform, and if speed matching were not required on ILEC FTTN facilities. The cable carriers submitted that if the Commission determines that the speed-matching requirement does not apply to the ILECs' wholesale aggregated ADSL access services, such a requirement should not apply to the cable carriers' TPIA services.
60. Bell Canada et al. submitted that a speed-matching requirement for ILECs and cable carriers would distort competition between the two, to the cable carriers' advantage. Bell Canada et al. also submitted that a speed-matching requirement would have a greater effect on the ILECs than on the cable carriers simply because competitors generally do not use the cable carriers' facilities to provide their own retail Internet services.

Commission's analysis and determinations

61. The Commission notes that a speed-matching requirement currently applies to the cable carriers' TPIA services. The Commission considers that applying a speed-matching requirement to the ILECs' aggregated ADSL access services would be equitable and would not represent a competitive advantage to either the ILECs or the cable carriers.

IV. The effect of the speed-matching requirement on the ILECs' abilities to offer new converged services, such as IPTV

Positions of parties

62. Bell Canada et al. and TCC submitted that a speed-matching requirement applied to FTTN facilities would unduly impair the ILECs' abilities to offer new converged services, such as IPTV.³¹
63. Bell Canada et al. and TCC submitted that they provide IPTV and Internet access service over a single loop³² and that their current modems³³ cannot technically or

³¹ IPTV is a service that delivers television programming to households via a broadband connection using Internet Protocol.

³² A loop consists of a twisted copper pair that terminates at the customer's premises. Its original purpose was to carry voice traffic, but ILECs are now able to carry broadband services, including high-speed Internet access and IPTV, over a single copper loop.

³³ In this context, the modem is a device on customer premises that terminates the copper loop and separates the IPTV service signal from the Internet access service signal, allowing the customer to connect the appropriate signal to a television or computer.

practically be shared to support the provision of retail Internet services from one service provider and IPTV services from another service provider. They also submitted that while it might be technically possible to deploy modems that could be shared between different service providers, the service configuration would become very complex and the services provided would become less reliable.

64. Bell Canada et al. and TCC argued that provisioning IPTV and Internet access services from different service providers over the same loop using a shared modem would introduce significant operational difficulties when troubleshooting service problems and dealing with customers. They suggested, for example, that when the customer encounters a service problem, the customer might be unsure about which service is the source of the problem and which service provider to contact to resolve the problem.
65. Bell Canada et al. and TCC submitted that provisioning IPTV service over a second loop that is separate from the one carrying the Internet service would not be a workable solution because, in many instances, second loops are not available or, if they are available, it might cost more to provide IPTV on a second loop than on the same loop.
66. Bell Canada et al. submitted that an end-customer would not reasonably want to receive IPTV service from an ILEC and retail Internet service from a third party, given the dependence of some IPTV service features on Internet service. They also submitted that the ILEC IPTV service would be unable to access content from the Internet, and the end-customer set-top box would be unable to connect and share content, if the end-customer were using a third-party Internet service.
67. The competitors submitted that the technical impediments to provisioning IPTV services from different parties over a single loop using a shared modem could be resolved. Further, in their view, sufficient volumes of spare loops are available in ILEC networks, such that the competitors could provide retail Internet services without impairing the ILECs' ability to provide converged services such as IPTV.

Commission's analysis and determinations

68. The Commission notes that all parties generally recognized the difficulties that modem sharing might entail. The Commission also notes that the evidence on the record of this proceeding indicates that it would be most unlikely that a retail end-customer would choose to purchase its retail Internet service from an ISP relying on ILEC wholesale services and to obtain its IPTV service from an ILEC. Therefore, the Commission considers that it would not be efficient to direct the ILECs to adapt their existing processes and systems to enable end-customers to receive IPTV from the ILECs and Internet services from a third party on a single loop with a shared modem.
69. The Commission considers that customers should have the option of dividing their IPTV and Internet services between service providers.

70. The Commission notes that in these rare cases where the customer chooses this option, the customer's retail Internet service and IPTV service would likely have to be provided over two separate loops, where a second loop is available.
71. The Commission notes that if a customer chooses to receive Internet service from a competitor where a second loop is not available, that customer would be precluded from receiving IPTV and other services provided by the ILEC, whether on a stand-alone or bundled basis. As well, if a customer chooses to receive IPTV from the ILEC where a second loop is not available, it would be precluded from receiving Internet service from a competitor that relied on the ILEC's loop to provide the service.
72. However, if the customer chooses to receive Internet service from a competitor and IPTV service from the ILEC, and the ILEC provisions a second loop, the Commission considers that it is reasonable that the ILEC should be compensated for the costs associated with this second loop. The Commission considers that the competitor should be required to pay the tariffed rate for the dry loop required to support that service, in addition to the rate that applies to the aggregated ADSL access service. On this basis, the Commission considers that an ILEC's ability to provide IPTV service would be preserved in the rare event that a customer decides to choose two service providers.
73. The Commission considers that the decision about whether to obtain Internet and IPTV services from one or two service providers is ultimately the customer's choice. The Commission also considers that the ILECs' ability to provide converged services cannot be construed as subject to undue impairment because the ILEC would not have to bear the cost of provisioning a second loop to provide its services.
74. In light of the above, the Commission concludes that a determination to require speed matching for aggregated ADSL access services would not unduly impair the ILECs' abilities to offer converged services such as IPTV.

Conclusions

75. In light of the Commission's careful consideration of each of the issues raised in the Order in Council, and based on the record of this proceeding, the Commission determines that the major ILECs are to provide speed matching for their aggregated ADSL access services,³⁴ subject to the qualification that in consideration of their very large investment in FTTN facilities, an increased markup is to be used to establish rates for new higher speed service options. The Commission concludes that an additional markup of 10 percent on Phase II costs for higher speed aggregated ADSL access service options recognizes this investment.

³⁴ Télébec does not provide an aggregated ADSL access service.

76. Further, the Commission concludes that, in the absence of a speed-matching requirement, competition in retail Internet services would not continue to be sufficient to protect consumers' interests.
77. The Commission also concludes that a speed-matching requirement would not unduly impair the ILECs' abilities to offer new converged services such as IPTV.
78. Accordingly, the Commission concludes that the major ILECs are to provide, upon demand from a competitor, their wholesale aggregated ADSL access services at speeds that match all of their retail Internet service speed options, including those speeds those ILECs offer their retail customers over their FTTN facilities.

B. Equity of existing wholesale access service obligations for the ILECs and the cable carriers

79. The Commission will address the following matters regarding the equity of the wholesale obligations between the ILECs for their aggregated ADSL access services and the cable carriers for their TPIA services:
 - (a) Level of aggregation
 - (b) Interconnection types and speeds
 - (c) Restrictions on use of service
 - (d) Conditions for economic Internet traffic management practices (ITMPs) for aggregated ADSL access and TPIA services

(a) Level of aggregation³⁵

80. The ILECs' aggregated ADSL access services enable a competitor to connect its own network to an ILEC's network at a single interconnection point, allowing it to provide high-speed access to any end-customer within an ILEC's operating territory. The competitor exchanges traffic with its end-customers through the interconnection point. In contrast, the cable carriers' TPIA services require a competitor to interconnect at multiple points of interconnection (POIs) to provide high-speed access to end-customers throughout the cable carrier's serving territory. The number of POIs varies by cable carrier TPIA service.³⁶ Aggregated ADSL access service provides a higher level of aggregation of competitor end-customer traffic than that provided by TPIA service.

³⁵ The term "aggregation" refers to the grouping of the traffic flows from individual end-customers into a smaller number of flows for efficient transmission through a data network.

³⁶ Number of points of interconnection in the cable carriers' territories, according to their TPIA tariffs – RCCI: 38, Cogeco: 40, Videotron: 5, and Shaw: 3.

Positions of parties

81. Competitors generally submitted that TPIA service should provide a level of aggregation of competitor end-customer traffic similar to the level provided by the ILECs' aggregated ADSL access services and that, at a minimum, the cable carriers should be required to aggregate traffic for competitors to the same extent and in the same manner that they do for themselves. TekSavvy submitted that traffic should be aggregated to the greatest extent possible to enable competitors to reach critical mass and compete. TekSavvy also submitted that the ILECs should not be permitted to remove the current level of aggregation from their aggregated ADSL access services.
82. Bell Canada et al. and Cybersurf submitted that competitors are at a disadvantage when using TPIA services because the high number of POIs required for interconnection to end-customers served by cable carriers within their operating territories increases complexity and adds costs for those competitors. Cybersurf also submitted that aggregated ADSL access service allows competitors to offer services in small markets with no additional capital outlay, in contrast to TPIA service, which, because it requires multiple interconnection points, makes service to small markets uneconomic for competitors.
83. The cable carriers submitted that the current TPIA service configurations were developed through industry forums that included competitors and through regulatory proceedings, resulting in a CRTC Interconnection Steering Committee-approved design that, in their view, provides an appropriate level of traffic aggregation. They suggested that competitors can supply their own aggregation through commercially available transport facilities, which allows each competitor to tailor the level of aggregation to its own requirements and to bear the costs of transport services to the extent transport services are used. The cable carriers submitted that a redesigned TPIA service would impose higher costs on all TPIA customers, regardless of the specific requirements of those customers.
84. The cable carriers submitted that modifying networks to support higher levels of aggregation for TPIA service would require significant redesign. They also submitted that this would entail additional costs to include (a) a portion of the backbone and core network architectural costs, and (b) provisions for traffic separation and distribution to competitors connecting at the core of a cable carrier's network. The cable carriers further submitted that increasing the level of aggregation would be contrary to the essential services framework because such a change would require including additional transport services, and transport services were classified as non-essential subject to phase-out in the essential services decision.

Commission's analysis and determinations

85. The Commission notes that there are significant differences in the level of aggregation of competitor traffic provided by the ILECs' aggregated ADSL access services and the cable carriers' TPIA services. Further, the Commission notes that the cable carriers have acknowledged that they aggregate traffic for their own retail end-customers in a different manner than they aggregate traffic for competitors' end-customers. Accordingly, the Commission considers that the wholesale obligations regarding aggregation of competitors' traffic are not equitable for the ILECs and cable carriers.
86. The Commission notes that TPIA service was classified as a conditional mandated non-essential service in the essential services decision, with transport included as a component of the service. The Commission also notes that different cable carriers include different levels of transport to support aggregation of competitor traffic within their TPIA service offerings. Accordingly, the Commission considers that including additional transport services within TPIA service is not contrary to the essential services framework.
87. The Commission notes that cable carriers would have to make network modifications to allow greater aggregation of end-customer traffic for their TPIA services. However, the Commission considers that, given the evidence provided by the cable carriers, it would be feasible to implement such modifications. The Commission considers that the matter can be appropriately addressed through recovery of the costs of implementing the modifications in question through modified tariffs.
88. In light of the above, the Commission concludes that the cable carriers should modify their TPIA services to provide competitors with access through as few points of interconnection as possible. The Commission further concludes that the aggregation of competitor traffic to interconnection points should be, at a minimum, to the same level as the cable carriers' aggregation of traffic for their own retail Internet service end-customers.

(b) Interconnection types and speeds

Positions of parties

89. Competitors generally agreed that the currently available TPIA service interfaces through which they can physically connect their networks to the cable carriers' networks are inferior to the interfaces that the ILECs offer for aggregated ADSL access services. They generally submitted that the cable carriers should offer a range of interconnection options comparable to those offered by the ILECs.

90. Cybersurf submitted that the cable carriers, other than Videotron, are reluctant to provide interconnection at speeds higher than 100 megabits per second. In Cybersurf's view, the maximum speeds provided are insufficient given the high end-user service speeds being offered with TPIA services. It also submitted that most ILECs provide interconnection for their aggregated ADSL access services at speeds up to one gigabit per second using gigabit Ethernet (GigE)³⁷ technology.
91. The competitors submitted that to ensure that competition is not diminished, the incumbents should be required to offer the latest generally available open interconnection standards being used in the industry, such as 10GigE, consistent with their own network architectures, as those standards evolve and are incorporated into their networks.
92. The cable carriers indicated that they were in the process of responding to and reviewing requests for higher speed interconnection options. Videotron submitted that it was providing these options to some customers on a trial basis.

Commission's analysis and determinations

93. The Commission notes that cable carriers have not expressed concerns about the feasibility of allowing enhanced interconnection options for the TPIA service and that they are either reviewing related requests or are, in fact, providing such interconnection options. The Commission considers that providing higher speed interconnection options for the TPIA service is technically feasible, would provide benefits for competitors, and would be equitable with the ILECs' aggregated ADSL access services to the extent now possible.
94. The Commission notes that implementation may require cable carriers to upgrade their network equipment to support higher speed interconnection. The Commission also notes that cable carriers may recover the cost for upgrading this equipment through updated TPIA tariffs.
95. In light of the above, the Commission concludes that the cable carriers should make GigE interconnection for their TPIA services available to competitors. The Commission also concludes that as higher speed interconnections become industry standards and are implemented by the incumbents, the incumbents should make them available to competitors.

³⁷ Gigabit Ethernet is a standard that supports transmission of Ethernet protocol frames at a rate of one gigabit per second.

(c) Restrictions on use

i. Local area network connection services and virtual private network services

Positions of parties

96. Competitors generally agreed that the TPIA tariff restrictions on competitor use for local area network (LAN) connection services and virtual private network (VPN) services should be removed.
97. The cable carriers submitted that competitors are interpreting the language in the tariffs as a restriction on using TPIA service for any type of LAN or VPN service, while the intent was to reflect the inherent lack of such capability in the cable carriers' network equipment. The cable carriers submitted that the tariff wording is subject to misinterpretation and agreed to remove it from the tariffs.

Commission's analysis and determinations

98. The Commission notes that neither aggregated ADSL access service nor TPIA service on its own allows competitors to provide LAN and VPN services to their customers. The Commission notes, however, that both the ILECs and the cable carriers submitted that competitors could use their own equipment in conjunction with, respectively, aggregated ADSL access service and TPIA service to provide LAN and VPN services to their customers.
99. In light of the above, the Commission concludes that the cable carriers should remove the wording regarding LAN connection services and VPN services from their tariffs.

ii. Multicasting

Positions of parties

100. The competitors generally agreed that the incumbents should make multicasting³⁸ functionality available to competitors as part of their wholesale offerings.
101. Bell Canada et al. submitted that a restriction on multicasting should be included in the relevant tariffs. They argued that making multicasting functionality available to competitors would allow competitors to offer an IPTV service, which would undermine demand for Bell Canada et al.'s service bundles.

³⁸ Multicasting is a technology used for efficient simultaneous delivery of information through a network to a group of end-users. A single copy of the information is introduced into the network from a source, and the network replicates copies to those who have requested the information. ILECs typically employ multicasting for their IPTV applications.

102. The cable carriers supported Bell Canada et al.'s request to include a multicasting restriction. They submitted that multicasting functionality was not in place in their networks and that provisioning a cable network to actively support multicasting service for TPIA customers would require them to deploy specific equipment configurations and capabilities that do not currently exist. In their view, multicasting support, if it were technically feasible, would cause severe congestion problems on a cable carrier's DOCSIS network.
103. The cable carriers submitted that maintaining a multicasting restriction would recognize that TPIA service and the ILECs' wholesale access services are intended as facilities to be used by ISPs to compete in the retail Internet market.

Commission's analysis and determinations

104. The Commission notes that aggregated ADSL access service and TPIA service do not require multicasting functionality to support high-speed access. The Commission further notes that, based on the record of this proceeding, the incumbents do not make use of multicasting functionality in the provision of their retail Internet access services and that such functionality is not in place in the cable carriers' networks.
105. In light of the above, the Commission concludes that the incumbents should not be required to provide multicasting functionality for their aggregated ADSL access services and TPIA services.

iii. Business use

Positions of parties

106. The incumbents submitted that there are no constraints on using aggregated ADSL access and TPIA services for business end-customers where facilities are available. The competitors submitted that the usefulness of TPIA service for business applications is limited because the cable carriers are unable to provide static IP addresses³⁹ for end-customers.

Commission's analysis and determinations

107. The Commission notes that competitors cannot provide static IP addresses to end-customers using TPIA service, but they can provide these addresses using aggregated ADSL access service.
108. Based on the record of this proceeding, the Commission also notes that some cable carriers offer retail business services that provide static IP addresses to end-customers. The Commission considers that this strongly suggests that it is possible for cable carriers to provide this capability with their TPIA services.

³⁹ A static IP address is a number that is assigned to a device, such as a computer, to be its permanent address on the Internet. An ISP assigns the address when it provides an Internet access service to an end-customer.

109. In the Commission's view, the cable carriers' inability to provide static IP address allocation for TPIA service means that the incumbents' obligations for the aggregated ADSL access and TPIA services are not equitable. The Commission notes, however, that there is insufficient information on the record of this proceeding to make a determination on the matter.
110. In light of the above, the Commission concludes that the cable carriers should show cause why they cannot provide static IP address allocation for their TPIA services.

(d) Conditions for economic ITMPs for aggregated ADSL access and TPIA services

111. In Telecom Decision 2010-255 (the usage-based billing or UBB decision), the Commission approved applications by Bell Aliant and Bell Canada to apply economic ITMPs – in this case, UBB – to their residential aggregated ADSL access services. However, this approval was conditional upon the following requirements: (a) Bell Aliant and Bell Canada must charge UBB rates to 100 percent of their retail customers, and (b) if they waive their retail UBB rates, they must treat their aggregated ADSL access service customers on an equivalent basis.
112. During this proceeding the Commission requested comments on whether these two requirements should also apply to cable carriers' economic ITMPs for TPIA service. Subsequently, Bell Aliant and Bell Canada applied to the Commission to review and vary these requirements of the UBB decision.
113. Because it is currently reviewing these two requirements, the Commission considers that it would be premature to make determinations in this decision regarding their application to the cable carriers' economic ITMPs for TPIA service.
114. Accordingly, the Commission will address this matter after disposing of Bell Aliant's and Bell Canada's applications to review and vary the UBB decision.

C. Access to new Internet access infrastructure

115. The Commission directed parties to provide their views⁴⁰ regarding the definition of new types of Internet access infrastructure and the principles that should govern mandating wholesale access services on such infrastructure.

Positions of parties

116. The Commission notes that some parties, notably Bell Canada et al., characterized their broadband facilities as "next generation networks." ILECs referred to various technologies as representing their next generation infrastructure, including VDSL,

⁴⁰ See schedule 2 of the Commission's letter of 21 April 2010, *Re: Organization and conduct of oral hearing*.

FTTN, and fibre-to-the-premises (FTTP) or fibre-to-the-home (FTTH) facilities.⁴¹ Cable carriers most frequently referred to their deployments of DOCSIS 3.0 as constituting their next generation infrastructure. Parties, however, did not arrive at a consensus on the definition of next generation networks or infrastructure.

117. The ILECs addressed the levels of investment being made in their network infrastructure. They submitted that if wholesale access were mandated for their next generation infrastructure, investments would be reduced in light of the financial risks they were taking. ILECs submitted that they do not have any incumbency advantages regarding next generation infrastructure.
118. The cable carriers requested that any determinations regarding the ILECs' next generation infrastructure be symmetrical regarding requirements placed on their own infrastructure. Specifically, they submitted that if access to the ILECs' next generation infrastructure is not mandated, then access to the DOCSIS 3.0 networks should not be mandated.
119. The majority of the incumbents submitted that there would be no risk of lessening competition in the absence of mandated wholesale access on their respective next generation infrastructures. In contrast, MTS Allstream submitted that a strong wholesale access regime is needed, particularly so that ILECs can provide services to customers in the operating territories of other ILECs.
120. Competitors generally shared the view that there is no true next generation infrastructure and that the deployments being made by incumbents are simply an evolution of their existing networks. In their view, it is essential to continue to mandate access in order to maintain competition in all markets. The consumer groups submitted that the existence of a wholesale access regime encourages innovation in the marketplace, which will allow Canada to compete globally.

Commission's analysis and determinations

121. Based on the record of this proceeding, the Commission considers that there is no utility in determining what, if any, facilities could be identified as "next generation." In the Commission's view, the real issue is to establish those wholesale obligations, if any, that should apply to identified facilities. In this decision, the Commission has determined that competitors continue to require access to the wholesale services currently offered by the incumbents over their digital subscriber line and DOCSIS platforms in order to ensure that sufficient competition exists in the provision of retail Internet services. In the case of the ILECs, the facilities that are subject to wholesale obligations include FTTN and, in the case of the cable carriers, DOCSIS 3.0 facilities.

⁴¹ FTTP facilities, also known as FTTH facilities, bring optical fibre directly to a customer's premises or home, where electronics are installed to convert optical signals to electrical signals. The use of FTTP or FTTH generally results in a change in how service providers deliver Internet services to the customer.

122. The Commission considers that as new technologies are deployed to deliver even higher speed broadband services to retail customers, there will likely be a demand for wholesale access to these services. The Commission notes that its existing essential services framework will allow it to assess any future services on a case-by-case basis, consistent with the requirements of the Act, the Policy Direction, and the principles set out in the Order in Council.

D. CO-based ADSL access service from the ILECs and local head-end-based cable access service from the cable carriers

123. In this proceeding the Commission asked parties to comment on the appropriateness of requiring ILECs to offer a new CO-based ADSL access service and cable carriers to offer a new local head-end-based cable access service.

(a) CO-based ADSL access service

Positions of parties

124. The ILECs submitted that it would be technically feasible to implement a CO-based ADSL access service. However, Bell Canada et al. submitted that such a service would have far more negative implications for investment in network facilities in Canada than would a determination to favour resale-based competition through a speed-matching requirement.
125. Primus Telecommunications Canada Inc. (Primus) and TekSavvy showed strong interest for a CO-based ADSL access service, but MTS Allstream, Distributel Communications Limited (Distributel), and Execulink Telecom Inc. (Execulink) did not support such a service; instead, they proposed that a regionally aggregated ADSL access service be created.⁴² However, the competitors all agreed on the need for a wholesale access service that would be free from ILEC traffic management policies, and that would be classified and priced as a conditional essential service.

Commission's analysis and determinations

126. In the essential services decision, the Commission considered the transport component of aggregated ADSL access service to be duplicable and, accordingly, classified the service as conditional mandated non-essential. Consistent with this view, and contrary to the submissions by certain parties, the Commission considers

⁴² The proposed regionally aggregated ADSL access service would require ILECs to aggregate the Internet traffic of end-users served by multiple central offices and to transport it to a regional interconnection point where a competitor could connect its own network. This solution would require multiple interconnection points to serve all end-users within an ILEC's operating territory. Parties proposed two options for the placement of interconnection points:

- i. at the central offices where the ILEC separates its own retail Internet traffic from its wholesale customers' Internet traffic; and
- ii. at central offices that are used by competitive local exchange carriers for exchange of voice traffic with ILECs. These central offices serve end-users that are within a local interconnection region, a region that typically includes multiple central offices.

that any new wholesale ADSL access service that includes a transport component beyond the local ILEC central office should not be classified as essential. One consequence of this consideration is that the pricing for such a service would be based on pricing principles that have been applied for mandated non-essential facilities.

127. The Commission notes that a regionally aggregated solution that differs from the current aggregated ADSL access service would require network modifications and service introduction costs, which would have to be recovered through the rate charged for this service. The Commission also notes that competitors would be required to interconnect at a greater number of interconnection points than they would for the existing aggregated ADSL access services.
128. The Commission notes that competitors requested that the proposed regionally aggregated ADSL access service be priced as an essential service. The Commission considers that given the similarities between the proposed regionally aggregated ADSL access service and the ILECs' existing aggregated ADSL access services, the rate for such a revised service, if mandated, would be based on pricing principles that have been applied to determine rates for the existing aggregated ADSL access services. The Commission is not persuaded that, with rates based on such pricing principles, and the need for additional transport, competitors would find the proposed regionally aggregated ADSL access service attractive. Accordingly, the Commission does not consider that it would be appropriate to mandate ILECs to provide a regionally aggregated ADSL access service.
129. The Commission notes that MTS Allstream, Distributel, and Execulink submitted that they saw no attraction in a CO-based service that would require co-location at the ILEC central office because they would be required to invest in co-location at, and transport components to, each ILEC central office at significant cost to use such a service.
130. The Commission notes, however, that Primus and TekSavvy expressed varying degrees of interest in the CO-based ADSL access service. TekSavvy demonstrated interest in being able to select from various ADSL access services.⁴³ The Commission also notes that both Primus and TekSavvy cited the imposition of the speed-matching requirement on aggregated ADSL access service as an immediate priority to address the substantial lessening or prevention of competition in the high-speed Internet service market.
131. In this decision the Commission has concluded that the ILECs are to offer their aggregated ADSL access services at all speeds that they offer their own retail Internet service customers. Further, as noted above, only two competitors have expressed interest in the CO-based ADSL access service and other competitors have expressed uncertainty regarding its benefits.

⁴³ The various ADSL access services of interest to TekSavvy are the existing aggregated ADSL access service, the proposed regionally aggregated ADSL access service, and the proposed CO-based ADSL access service.

132. In light of the above, and given the modifications to the TPIA service required by this decision, the Commission considers that there would not be a substantial lessening or prevention of competition without a CO-based ADSL access service. The Commission therefore concludes that the ILECs are not required to provision a CO-based ADSL access service.

(b) Local head-end-based cable access service

Positions of parties

133. Cybersurf proposed that a local head-end-based cable access service configuration be created and provisioned on radio frequency (RF) channels⁴⁴ dedicated to each competitor. Cybersurf submitted that the planned conversion of analog television channels to digital television channels by cable carriers, scheduled for August 2011, would allow the cable carriers to free up sufficient RF channels to provision this proposed wholesale service to competitors. Cybersurf further submitted that only a dedicated RF-channel-based service would allow competitors to offer multiple services including Internet, telephony, and IPTV to their end-customers. Competitors generally supported Cybersurf's proposal, noting that it was feasible and desirable for competition.

134. The cable carriers submitted that Cybersurf's dedicated RF channel proposal is not feasible because they lack spare RF channel capacity and it would be difficult to accommodate competitor equipment co-location in many of their local head-ends. They submitted that the only feasible head-end-based cable access service is the current TPIA configuration, which shares the same local RF channels among all ISPs, including the cable carriers themselves.

Commission's analysis and determinations

135. The Commission notes that some competitors acknowledged the limited availability of upstream channels on cable systems and, as a practical concession, proposed a wholesale service that would share upstream capacity among all service providers. These competitors submitted that no such downstream limitation exists and, therefore, cable carriers should be required to offer each service provider dedicated RF channels for downstream Internet traffic.

136. The Commission considers that for competitors to be able to offer their retail customers higher download speeds, cable carriers would have to provision each service provider with the same number of downstream RF channels as those cable carriers use for their own retail high-speed Internet services.

⁴⁴ Coaxial cable access facilities are divided into discrete channels to carry information from the customer (upstream) or to the customer (downstream); these discrete radio frequency channels are referred to as RF channels. Separate RF channels are designated to carry various services such as TV, high-speed Internet, and voice.

137. The Commission also considers that a dedicated RF-channel-based wholesale service would require competitors to be co-located at each local head-end, which could result in a lengthy process of developing co-location arrangements for each cable carrier. In addition, the Commission notes that the competitors did not provide a demand forecast for a local head-end-based cable access service provisioned over dedicated RF channels, as requested in a Commission interrogatory. Accordingly, the Commission considers that a dedicated RF-channel-based wholesale access service is not technically or economically feasible.
138. The Commission notes that the cable carriers submitted that a local head-end-based cable access service, similar to TPIA but offered on a mandated basis at each local head-end, is feasible. The Commission also notes that only TekSavvy forecasted specific demand for such a service, provided it allowed for interconnection in a manner similar to the existing TPIA service. The Commission further notes that the cable carriers submitted that there would be significant start-up costs and effort associated with introducing the service and that such costs would have to be recovered from the competitors that subscribe to it.
139. The Commission notes that, in general, competitors expressed interest in a TPIA service that would be more closely aligned with the aggregated ADSL access service offered by the ILECs. As in the case of the CO-based ADSL access service, the Commission considers that there would not be a substantial lessening or prevention of competition without a local head-end-based cable access service, given the presence of aggregated ADSL access service and TPIA service as modified by this decision.
140. In light of the above, the Commission concludes that the cable carriers are not required to provision a local head-end-based cable access service.

Implementation steps

141. The Commission directs the major ILECs to file, within 90 days of the date of this decision, proposed tariffs with supporting Phase II cost studies that reflect the Commission's determinations in this decision regarding speed matching for aggregated ADSL access services.
142. The Commission directs the cable carriers, with the exception of Bragg, to
- file, within 90 days of the date of this decision, proposed tariffs that include proposed configurations and rates, with supporting Phase II cost studies, for TPIA services that aggregate traffic for the competitors' end-customers as set out in section B.(a) of this decision;
 - file, within 30 days of the date of this decision, proposed updated tariffs to include the determinations in this decision regarding interconnection types and speeds, and restrictions on use, as set out in sections B.(b) and (c) of this decision; and

- show cause, within 30 days of the date of this decision, why they should not be required to provide static IP address allocation for their TPIA services.

Policy objectives advanced by the determinations in this decision

143. The Commission's determinations in this decision are based on the requirements of the Act, the Order in Council, and the Governor in Council's Policy Direction.
144. The regulatory measures under consideration in this decision are of an economic nature and deal with network access regimes. Therefore, subparagraphs 1(b)(ii) and (iv), paragraph 1(a), and subparagraph 1(b)(i) of the Policy Direction apply to the Commission's determinations.
145. Consistent with paragraph 1(a) of the Policy Direction, in all cases where the Commission has imposed regulatory requirements on the incumbents, it has done so because market forces cannot be relied upon to achieve the telecommunications policy objectives set out in section 7 of the Act, and it has adopted measures that are efficient and proportionate to their purpose.
146. The Commission considers that the policy objectives set out in paragraphs 7(a), (b), (c), (f), and (h) of the Act are advanced by the regulatory measures established in this decision.⁴⁵ The Commission considers that the objective in paragraph 7(f) of the Act – to foster increased reliance on market forces and ensure that regulation, where required, is efficient and effective – is of particular relevance. The determinations in this decision aim to ensure that retail Internet service markets will remain competitive and continue to deliver high-quality services and respond to users' economic and social requirements.
147. To ensure that competition in retail Internet service markets, notably in the residential market, remains sufficient to protect the interests of users as service speeds increase, the Commission has modified the basis upon which ILECs may charge wholesale customers for the provision of new higher speed options for aggregated ADSL access services. It has also concluded that a speed-matching requirement is necessary for the ILECs' existing aggregated ADSL access services. The Commission has further concluded that changes to the cable carriers' TPIA services are required. Consistent with its finding in the essential services decision, the Commission considers that the provision of these wholesale services, as modified by this decision, neither deter economically efficient competitive entry into retail Internet service markets nor promote economically inefficient entry.

⁴⁵ The cited policy objectives of the Act are
 7(a) to facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions;
 7(b) to render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada;
 7(c) to enhance the efficiency and competitiveness, at the national and international levels, of Canadian telecommunications;
 7(f) to foster increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective; and
 7(h) to respond to the economic and social requirements of users of telecommunications services.

148. The Commission has also addressed the matter of equity for the incumbents' relevant wholesale obligations. It considers that its determinations in this decision ensure the technological and competitive neutrality of these obligations to the greatest extent possible, consistent with subparagraph 1(b)(iv) of the Policy Direction.
149. In applying the essential services framework on a forward-looking basis in this decision, the Commission has adopted a cohesive, forward-looking regulatory approach that provides appropriate incentives for continued investment in broadband infrastructure, promotes retail service competition, ensures equity for the incumbents' respective wholesale obligations, and does not unduly impair the ILECs' abilities to offer new converged services.
150. The opinion of Commissioner Denton, dissenting in part, is attached.

Secretary General

Related documents

- *Bell Aliant Regional Communications, Limited Partnership and Bell Canada – Application to introduce usage-based billing and other changes to Gateway Access Services*, Telecom Decision CRTC 2010-255, 6 May 2010
- *Review of the Internet traffic management practices of Internet service providers*, Telecom Regulatory Policy CRTC 2009-657, 21 October 2009
- *Proceeding to consider the appropriateness of mandating certain wholesale high-speed access services*, Telecom Notice of Consultation CRTC 2009-261, 8 May 2009, as amended by Telecom Notices of Consultation CRTC 2009-261-1, 4 August 2009; 2009-261-2, 11 August 2009; 2009-261-3, 12 August 2009; 2009-261-4, 2 September 2009; 2009-261-5, 2 October 2009; 2009-261-6, 27 October 2009; 2009-261-7, 23 December 2009; and 2009-261-8, 12 March 2010
- *Cybersurf's application related to the implementation of Telecom Decision 2008-117 regarding the matching speed requirement*, Telecom Order 2009-111, 3 March 2009
- *Requests to review and vary directives in Telecom Decision 2008-17 related to the provision of central-office-based wholesale ADSL access service and aggregated ADSL access service*, Telecom Regulatory Policy CRTC 2009-34, 26 January 2009
- *Cybersurf Corp.'s application related to matching service speed requirements for wholesale Internet services*, Telecom Decision CRTC 2008-117, 11 December 2008
- *Revised regulatory framework for wholesale services and definition of essential service*, Telecom Decision CRTC 2008-17, 3 March 2008

- *TELUS Communications Company – Network-to-Network Interface Service, Wide Area Network ADSL Service, and Wholesale Internet ADSL Service*, Telecom Order CRTC 2007-25, 25 January 2007
- *Saskatchewan Telecommunications – Aggregated Asymmetric Digital Subscriber Line (ADSL) Service*, Telecom Order CRTC 2007-24, 25 January 2007
- *MTS Allstream Inc. – Asymmetric Digital Subscriber Line (ADSL) Data Access Service*, Telecom Order CRTC 2007-23, 25 January 2007
- *Bell Canada and Bell Aliant Regional Communications, Limited Partnership for services provided in Ontario and Quebec – Gateway Access Service and High Speed Access Service*, Telecom Order CRTC 2007-22, 25 January 2007
- *Bell Aliant Regional Communications, Limited Partnership for services provided in the Atlantic Provinces – ADSL Access Service and ADSL WAN Service*, Telecom Order CRTC 2007-21, 25 January 2007
- *Cogeco, Rogers, Shaw, and Videotron – Third-party Internet access service rates*, Telecom Decision CRTC 2006-77, 21 December 2006
- *TELUS Communications Inc. – Wholesale Internet ADSL Service*, Telecom Order CRTC 2006-17, 20 January 2006
- *Bell Canada – Gateway Access Service and High Speed Access Service*, Telecom Order CRTC 2005-62, 17 February 2005
- *Regulation under the Telecommunications Act of cable carriers' access services*, Telecom Decision CRTC 99-8, 6 July 1999
- *Forbearance from retail Internet services*, Telecom Order CRTC 99-592, 25 June 1999
- *Regulation under the Telecommunications Act of certain telecommunications services offered by "broadcast carriers,"* Telecom Decision CRTC 98-9, 9 July 1998
- *Local competition*, Telecom Decision CRTC 97-8, 1 May 1997
- *Competition in the provision of long distance voice telephone services and related resale and sharing issues*, Telecom Decision CRTC 92-12, 12 June 1992
- *Resale and sharing of private line services*, Telecom Decision CRTC 90-3, 1 March 1990

Opinion of Commissioner Timothy Denton, Dissenting in Part

This is a good decision, which does not go far enough. It keeps independent ISPs (Internet service providers) somewhat competitive, in the interests of the Canadian consumers and businesses. Yet it does not overcome the ambivalence that lies at the heart of the Commission's decision-making in regard to the independent ISP sector. It neither eliminates them nor allows them the scope to compete effectively. It maintains them in a kind of regulatory limbo.

The reasons why this ambivalence exists will be considered below.

The Commission has not seen fit to agree with the large carriers (cable and telephone) that the time has come to put an end to the leasing of parts of the networks owned by the large carriers, despite eloquent pleas by them to do so. It has, by the same decision, not approved the means necessary for smaller ISPs to compete effectively, which is to say, to allow them to lease and build facilities that would allow them to avoid the bit rate caps, the traffic management and other measures, which would allow the smaller ISPs to fulfill a more creative role.

Thus, as a result of this decision, the Commission has

- Approved speed matching, so that independent ISPs can match the speeds of the incumbents' retail Internet access offerings;
- Allowed incumbent telephone carriers a higher cost of capital for new wholesale Internet access services, which will be reflected in higher prices allowed for these services;
- Agreed that a duopoly of telephone and cable retail Internet access services is insufficient, and that wireless and satellite services are not yet attractive enough as large scale substitutes for wireline access in situations where wireline is available;
- Found that the smaller competitors bring pricing discipline, innovation and consumer choice to the retail Internet service markets;
- Determined that these wholesale services will eventually be eliminated when
 - functionally equivalent, practical and feasible wholesale alternatives exist for the current wholesale access services; or
 - when competition from all sources is sufficient to protect the interests of end-users, in retail Internet service markets, absent wholesale services.
- Taken steps to make the cable wholesale offering, Third Party Internet Access (TPIA) more useful and attractive, in a number of ways for those who lease it.
- Declined to engage in word games as to what next-generation services might consist of, or to engage in policy determinations in regard to access to them, but rather to decide on a case-by-case basis whether access to them will be justified.

These decisions seem reasonable and justifiable in the circumstances.

As regards the eventual elimination of wholesale services, I have doubts about whether wireless based alternatives will ever be sufficiently cheap and capacious to justify their elimination. This is a future state of affairs on which it would be superfluous to speculate, and I let the matter rest for the unfolding of events.

Where I depart from my friends on the panel is in relation to a technical arrangement called CO-based ADSL access service.⁴⁶ The advantage of such an arrangement, if it were brought into being, would be to allow an independent ISP to get behind the traffic management measures imposed by the incumbent carrier. The effect of doing so would be to allow substantial service innovations, so that the lessee of the wholesale service could rearrange the technical characteristics of the signal without harming the underlying network, and which would allow it to offer quality of service guarantees, different bit rates, capacities and prices. In short, innovation could proceed in ways not envisaged by the underlying carrier. The creation of such a service would also have provided the opportunity for some smaller carriers to move up the “investment ladder” to greater measures of facilities-based competition, which is approved of by policy-makers, but made impossible in practice by many forces.

In short, CO-based ADSL is a technical arrangement permitting significant service innovation, by allowing specialist carriers to differentiate significantly their service offerings from the underlying carrier.

The Commission has turned down CO-based ADSL. It has done so because in its judgment, it is not persuaded that the pricing principles upon which the new service would have to be based would make it attractive, and that only two of five significant smaller ISPs were interested in using the new type of service.

In short, in the presence of what it believes to be ambiguous signals from parts of the smaller ISP industry, the Commission has substituted its judgment of what the market would do, and declared itself satisfied with the arrangements foreseen in this decision.

I think this is unfortunate and mistaken. I shall try to explain why.

The attitude one takes towards this decision depends greatly on where you consider innovation comes from. If innovation comes frequently from smaller players trying to satisfy the novel requirements of specialized customers, then creating circumstances in which engineers can innovate is beneficial to the public; indeed, public policy in telecommunications should aim for it – in a sensible balance with other policy considerations.

Consider for a moment musical downloading. It started as a practice among technically aware youth and has spread to become socially normal. The means whereby it is

⁴⁶ CO means “central office” in telephonese. ADSL is asynchronous digital subscriber line.

accomplished were at first experimental, and then became more routine as the software was improved. Users developed the idea, and then business followed.

Likewise, I maintain, with telecommunications. In the race to satisfy special customer requirements there exists the possibility that the specialist software engineers of the smaller firms will beat the incumbents to a technical and business solution. To this extent it is socially useful for them to be able to re-assemble and re-purpose parts of the transmission systems, so long as network harm does not ensue. There may be other conditions which should be satisfied, too, but in general the inclination should be to favour the possibility of innovation.

Competition in telecommunications comes in two forms, not one. The first kind of competition, the conventional kind, is where carriers compete with each other, and further, the carriers determine what gets onto their networks. This would be the kind of competition that is characterized by what I call “closed end-points”. The customer gets what the carrier determines the service shall be. Service definition is fully in the hands of the carrier. The ability to modify any portion of the network to suit customer needs belongs solely to the carrier. The old public switched telephone network (PSTN) was of this nature, as is the business model of Apple, which alone determines which applications shall be allowed on its devices. This is a sensible business model if you are a carrier; it minimizes risk of harm to the network, and allows the carrier to capture the economic rents from the services it allows to be offered on its network, so that applications pay for infrastructure.

There is a second form of competition, which comes from innovation. It will be recalled that ISPs first came to public attention when they offered a way for people to get onto the Internet. The development of the Internet protocol (IP) suite has constituted a radical innovation in signal transmission systems. It came from developers outside the carrier industry. In turn, the IP suite has transformed the capacities of cable and telephone systems and made them rival to one another, since IP ended the single-purpose nature of transmission systems. In this model, applications still pay for infrastructure, but the owners of the applications have a right to get onto the infrastructure without anyone’s permission. This phenomenon is referred to as *innovation without permission*.

When people speak of competition in telecommunications, the distinction between open and closed end-points, and the consequences which flow from those technical possibilities, is not usually well understood.

The first people to satisfy consumer demand for access to the Internet were small ISPs, who saw a demand and found a technical way to satisfy it. Carriers caught up to them a few years later, and have been squeezing them out of business ever since the beginning of the 21st century.

The large carriers have to be encouraged to invest and innovate, certainly, and the Commission does everything it thinks necessary to allow that to happen. Yet the question remains whether two large players in each market constitute the right mix of factors to

encourage innovation in services. To this question the Commission has answered “no” on several occasions, including this one. Why then do I dissent in part from the decision?

My concern is that the Commission is not engaging the steps that would be consistent with allowing significant service innovation, and doing so on rather flimsy grounds that it knows better than industry participants what the difficulties might be. It has done this both in relation to CO-based ADSL access service, and with regard to local head-end-based cable access service. It has not investigated the matter in depth, in the sense of spending extra time investigating these matters. It has relied in part upon cost figures from the parts of the industry opposed to these possibilities. I think the Commission would have been better off looking into these assertions in greater depth than we did.

While I recognize that nearly all decisions are made with inadequate information, and in an environment of time and other constraints, I think we have failed here to take seriously the possibility of significant service innovation on the basis of questionable assumptions and inadequate digging into the issues.

At this stage it is appropriate to discuss the opinion-environment in which we operate. The opinion-environment pervades decision-making because it means that whatever differs from the current opinion environment will need more justification. More justification is both riskier and requires harder work. The large carriers have the inclination and ability to convey their messages to the public and the political class relentlessly and effectively. That message can be reduced to the simple proposition that they should at all times be allowed to maximize profits because only then can they make the investments they need to keep Canada internationally competitive. No matter what the profit margins are on leased equipment, wholesale services are always deemed to undermine profit maximization. It is a message constantly heard by the Commission and we have repeatedly found it to be without merit.

Networks are private property and derogations from the full rights of ownership are deeply suspect. In this view, those who lease equipment and services, regardless of the profit margins allowed by regulation, ought in principle not to exist, or if allowed to exist, they should have no rights to lease services at tariffed rates, but should have to negotiate the price.

Experience has shown in New Zealand and elsewhere, including this country, that the duration of negotiations and the price demands of the carrier will ensure the business opportunity disappears.

Networks are not of the same order of thing as a metal-stamping business. They are affected with the public interest, which is merely to say that the reasons why they are subject to a measure of regulation under the *Telecommunications Act* are valid.

The Commission does not believe that innovation occurs only at the edges of the network. The right of carriers to innovate in network architectures is absolute, subject to

the normal policy constraints of non-discrimination and non-self-preference. The question remains whether innovation from the edge will ever be allowed again, after the burst of innovation which accompanied the introduction of the Internet.

What is deplorable, in my view, is the disinclination to consider that specialist outfits like small ISPs should be allowed the opportunity for service innovation because the Commission:

- a) substitutes its opinion for what certain players in the market might decide to do;
and
- b) declines to investigate the options for innovation in a serious and prolonged way.

The result is that the possibility for service innovation was turned down, without sufficient consideration, in my estimation. The current ambivalence about the role and legitimacy of smaller carriers continues. They are allowed to exist but denied the means to innovate. In a business with as much uncertainty as this, turning down the possibility for technical and business innovation seems a riskier move than letting it go ahead. To that extent, I dissent.