



File No. 8663-C12-201313601

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To: Mr. John Traversy
Secretary General
Canadian Radio-television and
Telecommunications Commission
Ottawa, Ontario
K1A 0N2

Subject: Telecom Notice of Consultation CRTC 2013-551, Review of wholesale services and associated policies – Undertakings

Dear Mr. Traversy,

1. Pursuant to the procedures set out in a Commission staff letter dated 24 November 2014 and during the Oral Hearings, we are providing the attached Undertakings.
2. Pursuant to section 39 of the *Telecommunications Act*, in these Undertakings, we are providing certain information to the Commission in confidence, for the reasons stated therein.

Yours truly,

[Original signed by P. Gauvin]

Philippe Gauvin
Senior Legal Counsel

Attachment

c.c.: Lyne Renaud, CRTC
Philippe Kent, CRTC
Distribution List as per CRTC letter dated 24 November 2014

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Q. One of the benefits of FTTP is the higher service speeds that can be attained. Your company is offering lower service speeds on FTTP that are also supported on other technologies. Of the subscribers served by FTTP what proportion of your subscribers are subscribing to the higher speeds achievable only on FTTP rather than the speeds currently available on DSL-based technology?

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

As we currently offer speeds of 50 Mbps over DSL-based technology today, our response provides the percentage of subscribers on FTTP that subscribe to speeds higher than 50 Mbps. In the Atlantic, Bell Aliant's lowest speed offer on FTTP to residential subscribers is 75 Mbps, therefore 100% of its FTTP subscribers by definition are on speeds higher than 50 Mbps. We note, however, that there is minimal ISP demand in the Atlantic. In contrast, where customers can select between lower and higher speeds (i.e. business customers in Atlantic and residential and business customers in Ontario and Quebec), customer selection of FTTP speeds above 50 Mbps remains limited.

	Residential	Business
Atlantic	#	#
Ontario and Quebec	#	Data Unavailable

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¹ Broadcasting and Telecom Information Bulletin CRTC 2010-961, *Procedures for filing confidential information and requesting its disclosure in Commission proceedings*, dated 23 December 2010, as amended in BTIB 2010-961-1 to reflect the directives in Telecom Regulatory Policy CRTC 2012-592, *Confidentiality of information used to establish wholesale service rates*.

Q. ILECs have submitted that there would be significant costs to implement BAS. Provide the start up costs for implementing BAS by central office. Identify all central office configurations and provide the start up costs by configuration.

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

In this response we provide the start-up costs to implement Broadband Access Service (BAS) by central office (CO), identifying the various CO configurations. We also take the opportunity to address here the Commission's request to provide information on how BAS costs could be recovered given that ISPs would only be ordering the service in some locations at different times (which is The Companies – Undertaking #7). Finally we note that given the high costs and upfront fees, there would be virtually no demand for BAS – thereby making it even harder to pass a cost-benefit analysis.

To be clear, we oppose BAS for all the reasons set out in our oral testimony.² We will not repeat all of those arguments here.

¹ Broadcasting and Telecom Information Bulletin CRTC 2010-961, *Procedures for filing confidential information and requesting its disclosure in Commission proceedings*, dated 23 December 2010, as amended in BTIB 2010-961-1, dated 26 October 2012 to reflect the directives in Telecom Regulatory Policy CRTC 2012-592, *Confidentiality of information used to establish wholesale service rates*.

² Transcript, Vol. 3, 26 November 2014, paragraphs 3259 to 3321.

Technical Description of BAS

Based on CNOC's description of BAS, ISPs ordering BAS would either self-provision or lease transport facilities from their POP to a CO and interconnect with one of our Layer 2 Ethernet switches in order to reach all of the end-users served from that CO.

In this proceeding, ISPs have requested that the Commission mandate an unbundled wholesale high-speed service called BAS which some have described as simply a disaggregated Gateway Access Service (GAS). It is important to clarify at the outset that unbundling GAS, which is the aggregated wholesale high-speed service that ISPs almost exclusively use, is not a viable solution. The traffic from GAS end-users is aggregated at a centralized Broadband Remote Access Server (also known as a BRAS) where the end-users' wholesale ISP is identified so that the traffic can be tunneled to the appropriate ISP. Until the end-user traffic reaches the BRAS, we are unable to distinguish the wholesale customer's traffic from our own retail Internet traffic. Since we do not have a BRAS in every CO, an unbundled GAS service that excludes the transport component would not be possible in most cases. And, of course, Capacity Based Billing (CBB) charges would remain significant if BAS were unbundled at a centralized BRAS. For these reasons, unbundling GAS is not an option to implement BAS.

Unlike for GAS, it is possible to distinguish the traffic of the individual end-users of wholesale High-Speed Access (HSA) service destined to a given ISP at the serving CO, since each end-user is assigned to a unique virtual path (known as a VLAN). It would thus be technically feasible to modify the current architecture for HSA service and adapt some of the existing processes to implement a BAS service. We believe that this solution is in line with the solution proposed by the ISPs when they mention that they expect to interconnect at the CO on a Layer 2 switch.

The ISPs who indicated that they want to connect at the CO would likely want to migrate their GAS end-users to BAS once a CO is enabled for BAS. It is very important to understand that this would not be a seamless step. Individual VLANs for each BAS end-user would have to be set-up and GAS subscribers converted from an aggregated model

to the dedicated VLANs, thus interrupting end-users' services. Moreover, depending on the way ISPs implement BAS in their network, the modems that the ISP is using for its GAS end-users would either have to be reconfigured or even replaced in some cases. This would require a lot of time and resources to implement for both us and the ISP, and it is not clear whether the ISPs factored this in their assessment.

As is the case today for our retail high-speed Internet services as well as wholesale aggregated high-speed services (GAS and HSA), BAS would also be a best effort service without support for multicasting. The ISPs would continue to be able to send various types of traffic, including multicasting traffic, but our network would still be oblivious to the type of traffic and treat all wholesale and retail Internet traffic equally.

The Categories of Costs for Implementing BAS

If BAS was mandated, there are four categories of new costs that would need to be recovered:

1. Information Systems and Information Technology (IS/IT) Development – the costs of modifying the systems and developing the processes for this new service;
2. CO BAS Enablement – the cost of the additional equipment that needs to be installed in each CO to enable BAS in that CO;
3. Ongoing Maintenance – the costs of upkeep for this equipment; and
4. Connection – the costs for the line cards and optical links unique to BAS.

We provide further details later in our response on how the various cost components should be recovered but, at a high level, we are recommending that the costs for the new equipment in the CO be recovered on a per CO basis via an upfront charge that would be paid by the ISP(s) that request BAS in a particular CO. The systems and development costs, the ongoing maintenance of the equipment, the line cards and optical links would be recovered through a usage charge in a manner similar to how

CBB is currently applied but the actual usage rate would be developed using costs that are specific to BAS service.

In addition to the above new costs, the ISP would also be required to continue to order some existing services – specifically a BAS Interface (to interconnect at the CO) and a BAS Access (to connect from the CO to the individual end-user's premises) as further explained below:

- BAS Interface – At present the ISP can connect at one Aggregated High-Speed Service Provider Interface (AHSSPI) from which they can reach the entire Bell Canada and Bell Aliant Ontario and Quebec DSL/FTTN footprint. With BAS, the ISP would only be connecting at a single CO to serve that CO. As such, the ISP would require a separate BAS interface at each CO (which is essentially a port on the new BAS Ethernet fan-out switch) from which it wants to purchase BAS. Conceptually, this port charge is the same service as AHSSPI – however, the current rate may have to be modified given that the ISP is paying for a portion of the BAS Ethernet fan-out switch upfront and the current costs in the AHSSPI cost study assume that the line card and the Ethernet switch is shared between retail and wholesale services with a certain fill factor. Nevertheless, given these monthly costs are small, we would expect the BAS interface rates to be in the same range as the existing AHSSPI rates.
- BAS Access – As for the BAS Access rate, we would expect it to be the same as the rate in place for GAS access for FTTN and Legacy services. We would expect that the BAS one-time service charge would be based on the one we presently charge for HSA, i.e. \$227.76.

Due to the short timeframe allotted to respond to this undertaking, it was not possible to assess the costs associated with providing access to FTTP end-users. Assessing the systems and development costs would require a lot more time and effort given that a wholesale high-speed service over FTTP does not exist, let alone the costs for each FTTP access. Unlike with FTTN or Legacy DSL, it is not simply a matter of determining

how to unbundle an existing wholesale high-speed service like GAS or HSA. As such, the costs provided in this response exclude enabling BAS service for FTTP end-users. However, as noted above, the four new categories of costs for BAS and the BAS Interface charge, would apply equally to FTTP as it would to FTTN or Legacy DSL with the caveat that the first category, i.e., the IS/IT Development Costs, would be different, since a wholesale service on FTTP does not exist and the costs provided in this answer do not take this into consideration.

Start Up Costs

In this section, we estimate the start-up costs to implement BAS broken down by the costs for systems and process development costs, and the costs per CO which are dependent on the configuration.

1. **Information Systems and Information Technology (IS/IT) Development Costs**

The estimated systems and process development costs are [REDACTED] # for Bell Canada and Bell Aliant in Ontario and Quebec, [REDACTED] # for Bell Aliant in the Atlantic region and [REDACTED] # for Télébec. These costs assume that we would be able to leverage some of the existing HSA and CBB systems and processes. In addition to adapting the existing processes, there would be development efforts required such as establishing processes for ISPs to be able to request certain COs to be set-up for BAS, and developing and testing a new service architecture to manage aggregate capacity at the CO across our network elements. We would also need to add new speed profiles as the current maximum speed for HSA service is 16 Mbps which is the maximum speed for our Layer 2 retail Business Internet service on DSL.

In essence, there would be software enhancements required for Operations Support Systems (OSS) and the elaboration of processes, methods and procedures in the following operational domains:

-
- Billing
 - Order Registration
 - Facilities Assignment and Circuit Design
 - Service Activation
 - Service Assurance - Testing
 - Trouble Management
 - Network Planning and Provisioning

2. CO BAS Enablement

For BAS service, in each CO, we would aggregate the traffic from each ISP's Legacy and FTTN end-users and present this traffic to the ISP on an Ethernet port of an Ethernet switch. From that port, the ISP would order standard connecting links to send the traffic to its co-location space or lease transport facilities.

As depicted below, there are four typical configurations that could be encountered in a CO. Figures 1 and 2 respectively illustrate the configurations for large and medium COs that already have or require an ATM to Optical Ethernet converter (ATM-OE converter). Figures 3 and 4 respectively illustrate the configurations for small COs that already have or require an ATM-OE converter.

Contrary to what CNOC assumed, it is not possible to simply interconnect to an existing Ethernet switch to enable BAS service. In each CO, even where we already have Ethernet switch(es) in place, a new BAS Ethernet fan-out switch would still be required.

A new BAS Ethernet fan-out switch is required to accommodate sufficient upstream ports to serve multiple operators as our Ethernet switches in place are not sized to accommodate BAS service. The existing Ethernet switches are sized to meet the aggregation requirements of our access nodes (FTTN and

FTTP) and would not be cost effective or operationally ideal for individual wholesale ISP connections.

Furthermore, in many COs, we have multiple Ethernet switches to which are connected a number of DSLAMs and these switches are not interconnected to each other. Therefore, without a new BAS Ethernet fan-out switch to aggregate the traffic from all of the end-users served from DSLAMs connected to various Ethernet switches, the ISPs would only be able to order BAS for the subset of end-users served from the DSLAMs connected to a single Ethernet switch which would not make a lot of sense. In practical terms, this means that for ISPs to have access to all of the end-users served from our DSLAMs in that CO and receive traffic at a single point, they must interconnect to a BAS Ethernet fan-out switch that, itself, will need to be connected to all of the Ethernet switches in the CO that connect DSLAMs.

There is another important consideration. Although we have stopped investing in ATM DSLAMs and ATM switches, there are still a number of these remaining in our network. In some COs, there are ATM DSLAMs that have not yet been connected to an Ethernet switch and still ride on our ATM network. They are thus unable to connect to the BAS Ethernet fan-out switching without installing a gateway, i.e., an ATM-OE converter. Therefore, for any CO that has ATM DSLAMs without an ATM-OE converter, the implementation of BAS service would require the deployment of ATM-OE converters and require the migration of all ATM DSLAMs to the ATM-OE converter. Another aspect that has not been factored into the cost assessment is the fact that several components of ATM-OE converters will become discontinued over time, some as early as 2015. This means that the supply of that equipment, including line cards, could become challenging in the next few years and lead to the requirement for introducing new equipment to do that function.

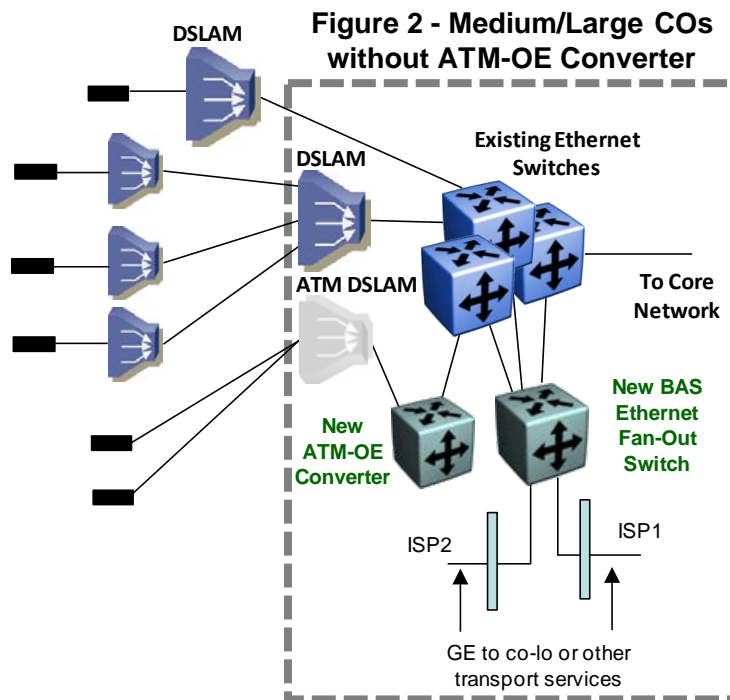
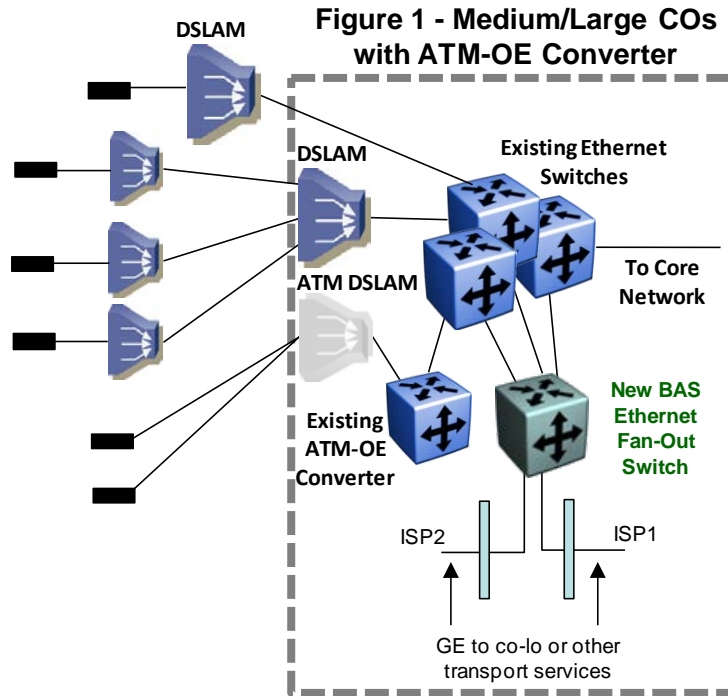


Figure 3 - Small COs with ATM-OE Converter

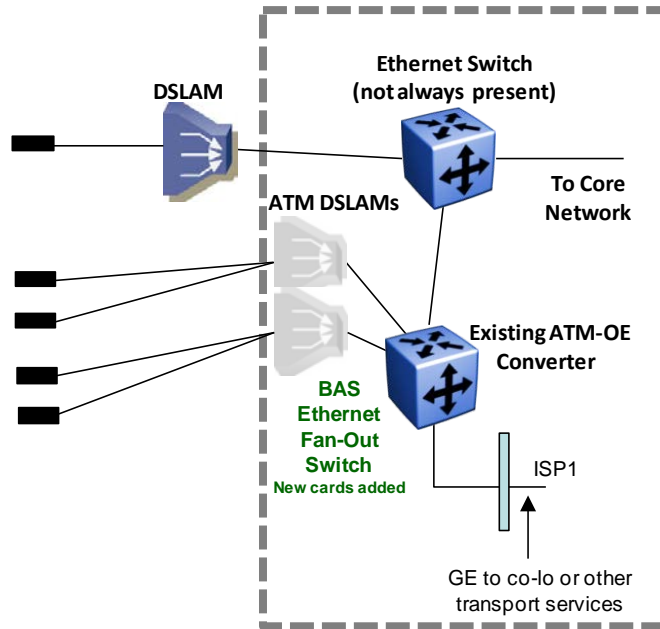
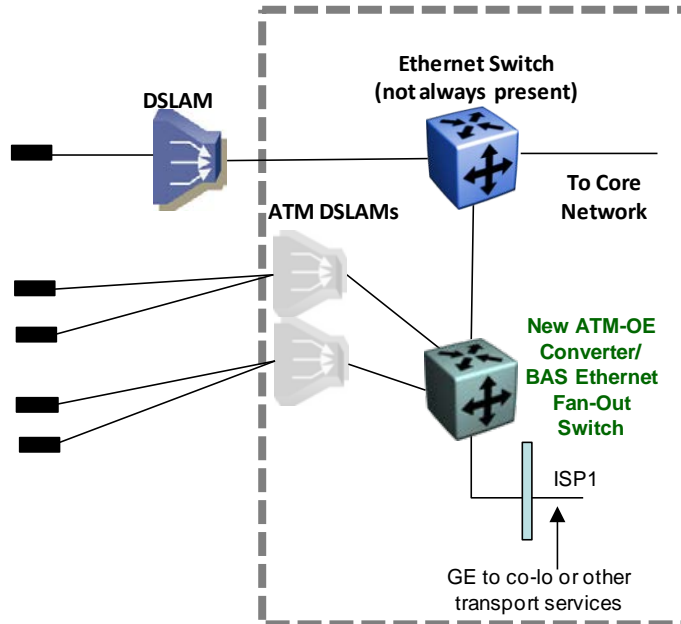


Figure 4 – Small COs without ATM-OE Converter



The total costs to implement BAS were developed based on the actual equipment required in a CO based on its size and the configuration. For instance, for a large CO, the costs for the new BAS Ethernet fan-out switch equipped with common line cards and, where required, the costs for the ATM-OE converter and the costs to migrate the ATM DSLAMs to the ATM-OE converter were added. A range of costs is provided to account for whether there is a need or not to install an OE-converter and to migrate ATM DSLAMs to the OE-converter. As explained later in this response, the connections from the BAS Ethernet fan-out switch to the existing Ethernet Edge switches (i.e., the costs for the line cards and links between the BAS Ethernet fan-out switch to the existing Ethernet switches in the CO) were excluded as these would be recovered in a separate usage charge. The same exercise was repeated for the medium COs except that the Ethernet switch is smaller and less costly. In the case of smaller COs, where an Ethernet switch and an ATM-OE converter are both required, the costs for a single device that does both functions was factored in. Capacity costs were used in each case where the network elements can be shared.

The following table provides, for Bell Canada and Bell Aliant in Ontario and Quebec, the per CO costs for each configuration to implement BAS in COs where high-speed is enabled.

Configuration	Range of Costs Per CO
Large CO	From # to #
Medium CO	From # to #
Small CO	From # to #

Start up costs for Bell Aliant in the Atlantic region and T el ebec were not assessed given the short timeframe to respond to this question.

Cost Recovery for BAS implementation

In this section we outline our proposals as to how these costs would be recovered. We propose that there would be four separate tariff items for BAS. As mentioned above, two of these (at least for FTTN and Legacy DSL) already exist: BAS Access³ and BAS Interface (which would need to be recalculated but would be based on the existing AHSSPI rate). A separate BAS Interface would be required for each CO to which an ISP interconnects its BAS service.⁴ The four new costs types for BAS listed at the beginning of this undertaking could be divided into two tariffs: a CO Enablement Charge and a usage-based charge (BAS CBB).

CO Enablement Charge

In each CO that will offer BAS, there are start-up costs. These start-up costs consist of installing equipment in each CO where BAS will be offered. Because this equipment is required when an ISP(s) requests BAS and we incur this cost upfront, we believe it is appropriate to recover this cost upfront when we incur it. Furthermore, this cost should be shared by the number of ISPs that request BAS at a specific CO.

We recommend the application of the upfront charge be identical to our Type 1 Co-location offering.⁵ The Type 1 Co-location approach was approved in Decision 97-15 for construction of co-location space. In its decision, the Commission noted that it would be difficult to estimate co-location demand at each CO with any degree of certainty. Therefore, it determined it is appropriate to charge co-located carriers on the basis of costs incurred.⁶ This is the same situation we face for the CO Enablement Charge. It is an upfront charge for which it is difficult to estimate the demand at each CO. The majority of ISPs would continue to have access to GAS while the few ISPs that requested BAS have indicated that they want BAS to reduce their CBB costs. It is therefore only fair that the ISPs that want BAS service be the ones required to incur these costs.

³ See General Tariff 6716, Item 5410 for Legacy GAS Access and Item 5440 for FTTN GAS Access tariffs.

⁴ See General Tariff 6716, Item 5410-4(f) for AHSSPI tariffs.

⁵ For Type 1 Co-location, see Bell Canada's Access Services Tariff 7516, Item 110-4(b).

⁶ See paragraph 82 of Telecom Decision CRTC 97-15, *Co-location*, dated 16 June 1997.

The Type 1 Co-location offering specifies that if only one ISP requests BAS service at a specific CO, this ISP would be charged the entire upfront charge for the CO Enablement costs. If more than one ISP requests BAS service at the same time and for the same specific CO, the upfront charge for the CO Enablement costs would be shared equally between those ISPs. If, within a period of 60 months of providing the BAS service at a specific CO, additional ISPs place firm orders for the BAS service at the same specific CO, the additional ISP(s) will be charged a proportionate share of the initial costs and this amount will be reimbursed equally to the ISPs that already have BAS service at that specific CO.

Usage (BAS CBB)

For BAS, the GAS CBB tariff rate will not be applicable. Instead, a BAS CBB specific monthly rate will be developed to cover the following costs:

a) *Usage sensitive switching costs*

Usage sensitive switching equipment is required at the CO that BAS is offered in. This is in addition to the CO start-up equipment. Usage sensitive equipment includes the ports on the Ethernet switches that already exist in the CO (and are partly recovered through the CBB charge today when GAS is provisioned), the optical links between the existing Ethernet switches and the new BAS Ethernet fan-out switch and finally, the ports on this new switch. Usage sensitive equipment costs may include other equipment costs besides the Ethernet switching costs. However, for clarity, these costs do not cover the BAS Ethernet fan-out switch as that would be recovered in the CO Enablement charge.

b) *Maintenance costs*

Maintenance costs on the usage sensitive switching costs will also be included in the monthly usage charge as well as the maintenance on the start-up equipment at each CO where BAS is offered. Maintenance is an ongoing cost and we will incur maintenance on this equipment. Therefore, it is appropriate to recover

maintenance costs causal to the BAS start-up equipment and on the usage sensitive equipment. Since maintenance is ongoing, it is appropriate to recover it on an ongoing basis.

c) *IS/IT development start-up costs*

IS/IT development is required upfront to set-up the BAS wholesale service to ensure the service can be ordered, provisioned, billed and repaired. This development includes all the methods and processes required for a new service offering. IS/IT development costs should be recovered through the monthly usage rate. This way, this development cost is spread over the expected demand in the study period. This is the typical way in which we recover IS/IT development costs in our economic studies.

Of course there will be additional costs for co-location if the ISP self supplies its transport, or for leasing backhaul from us. But those services already exist today and would not be directly part of the BAS tariff.

The Limited Demand for BAS

As mentioned above, we do not believe that BAS would pass any cost-benefit analysis, but that discussion is beyond the scope of this undertaking. However, it is important to note that we believe, given the high costs of BAS, there will be limited or no demand for the service. In this section we explain why that is the case.

We assessed in which COs ISPs may want to implement BAS based on certain factors. Knowing the equipment start-up costs and the estimated additional one-time service charge⁷ to install BAS, we calculated approximately how many end-users would be required in a CO to offset, within a reasonable timeframe of five years, this initial investment with potential savings in GAS CBB charges. It was determined that there

⁷ In our assessment we used \$137 which represents the difference between the HSA service charge and the GAS service charge (\$227.76 - \$90.65) as this likely would drive the ISP's choice of service.

would need to be at least [REDACTED] # end-users per CO to recover the upfront investment. Of the [REDACTED] # DSL enabled COs, only [REDACTED] # COs have that many end-users in aggregate but no single ISP in these [REDACTED] # COs has the minimum amount of end-users to recover the upfront investment. Assuming that one ISP had half the required number of end-users and could aggregate its demand with that of other ISPs to offset the initial investment, there would be approximately [REDACTED] # COs which are in the major urban centres that would comprise the potential pool of COs in which ISPs would consider BAS.

This is only a very high-level conservative assessment to identify COs in which BAS might be considered, and of course it would not be implemented in every one. From this group, ISPs would need to consider whether the incremental benefits of BAS would justify the amounts they would need to pay for the BAS Access rates, the BAS Interface, the usage sensitive components and to provision their own facilities to get to the CO. These ongoing wholesale costs for each end-user would have to reflect the very significant start-up costs for the service, including the [REDACTED] # in IS/IT costs for Bell Canada and Bell Aliant territory in Ontario and Quebec. Given that these costs could be spread across a base of ISPs end-users located in approximately [REDACTED] # COs, the wholesale rates for the service are likely to be prohibitively high for ISPs. As a result, we simply do not believe – and have seen no evidence – that there would be any material demand for BAS.

Moreover, the question for the Commission is not simply whether there might be demand for BAS from some ISPs but whether there are public policy benefits from mandating BAS (beyond the current regulatory measures or even market forces) that outweigh the very significant costs that it would entail. For the reasons we gave in our oral testimony (including the very high costs to implement), BAS could never pass a cost-benefit analysis undertaken from a public policy perspective, even if the potential demand were higher than what we have estimated.

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Q. Provide the names of your ULL customers, as well as the respective quantity of ULLs provisioned as of year-end for each of the years 2009 to 2013. In addition, for each ULL customer, identify the total number of ULLs provisioned by rate band for each of the years 2009 to 2013.

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

As we have previously indicated in our First Intervention, in Ontario and Quebec the installed base of Bell Canada's ULLs in Bands A and B has decreased from 424K in-service at the end of 2008 to 182K. As evidenced by Tables 1 and 2, this rapid decrease is not limited to Bands A and B and is also experienced by Bell Aliant in Atlantic Canada.

¹ Broadcasting and Telecom Information Bulletin CRTC 2010-961, *Procedures for filing confidential information and requesting its disclosure in Commission proceedings*, dated 23 December 2010, as amended in BTIB 2010-961-1, dated 26 October 2012 to reflect the directives in Telecom Regulatory Policy CRTC 2012-592, *Confidentiality of information used to establish wholesale service rates*.

Table 1
Total Unbundled Loop Demand by Band
Bell Aliant and Bell Canada in Ontario and Quebec

Year	Band A	Band B	Band C	Band D	Band E	Band F	Band G	Total
2009	#	#	#	#	#	#	#	403,007
2010	#	#	#	#	#	#	#	344,317
2011	#	#	#	#	#	#	#	261,347
2012	#	#	#	#	#	#	#	228,791
2013	#	#	#	#	#	#	#	210,607

Table 2
Total Unbundled Loop Demand by Band
Bell Aliant in Atlantic Canada

Year	Band A	Band B	Band C	Band D	Band E	Band F	Band G	Total
2009	#	#	#	#	#	#	#	5,790
2010	#	#	#	#	#	#	#	5,184
2011	#	#	#	#	#	#	#	4,624
2012	#	#	#	#	#	#	#	2,211
2013	#	#	#	#	#	#	#	1,892

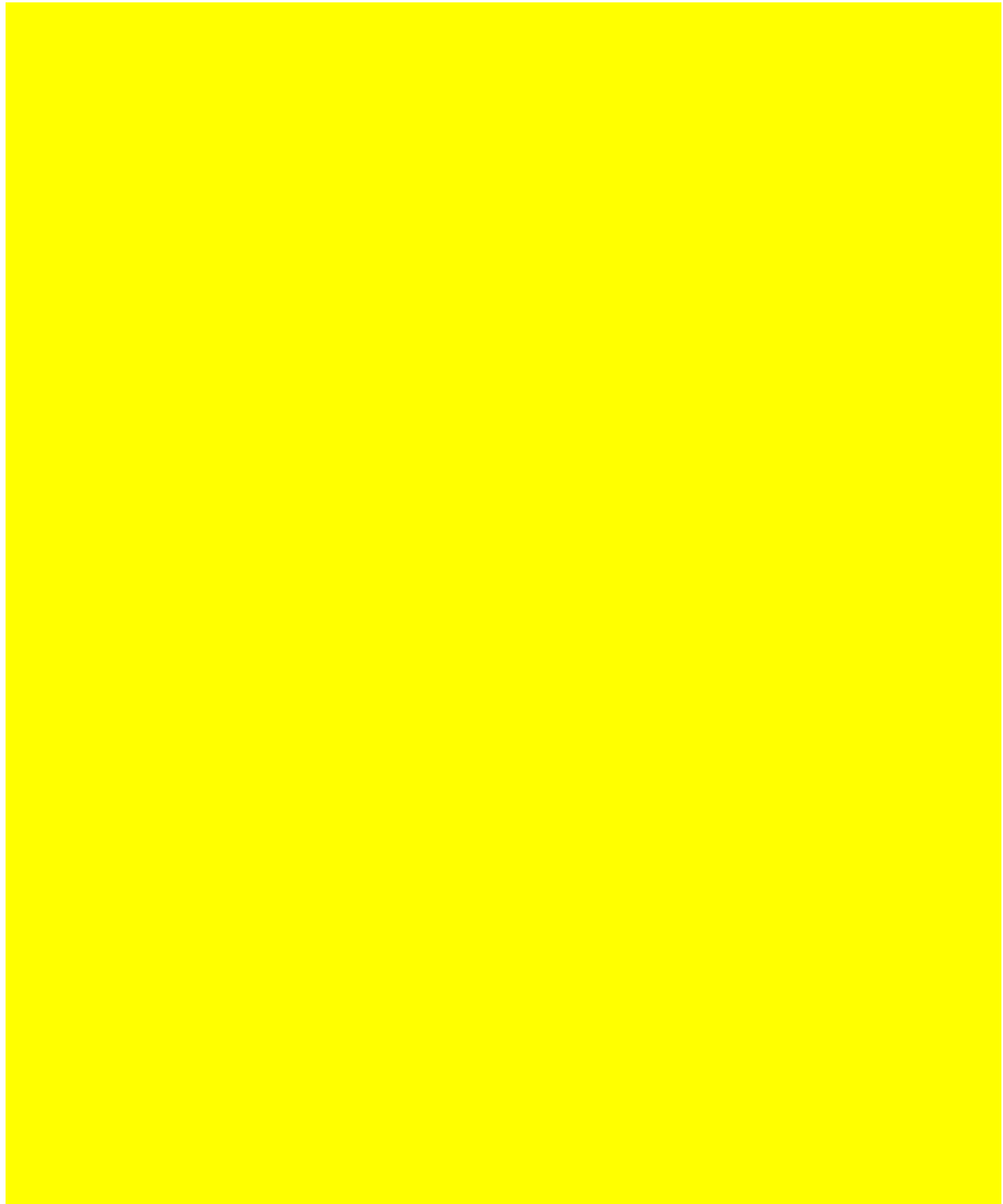
We also note that, for Bell Canada, only four wholesale customers still buy more than 10,000 loops each. These customers, who represent 86% of our loops demand, decreased their number of loops by 18% from 2011 to 2013. The remaining customers are all quite small; none of them ordering more than 4,000 loops.

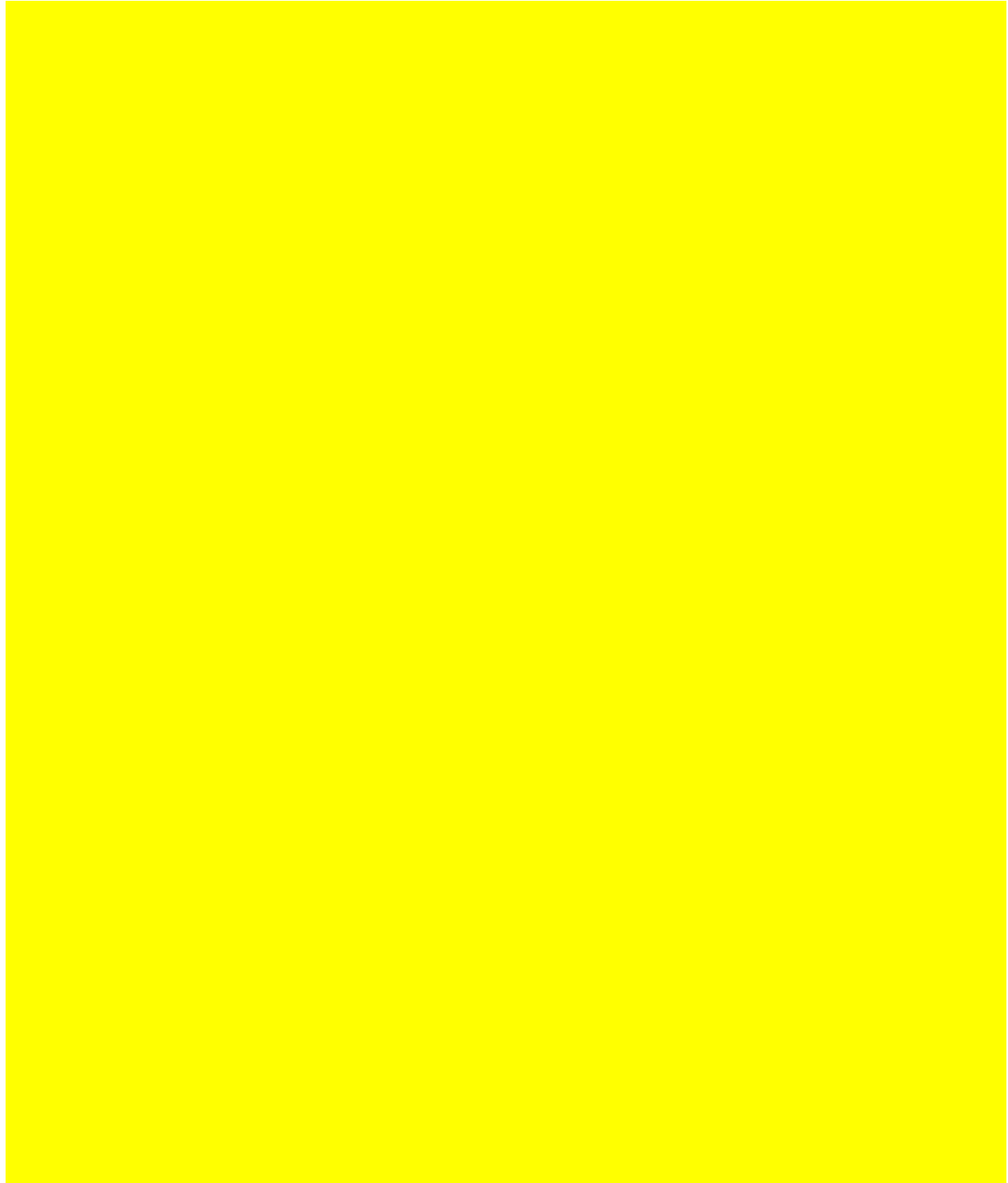
The specific information requested by the undertaking is provided in Table 3, combining Bell Aliant and Bell Canada in Ontario and Quebec, and Table 4 for Bell Aliant in Atlantic Canada. Télébec does not have any provisioned unbundled loops.

Table 3
Unbundled Local Loops In-service (Year-End) by Rate Band
for Bell Aliant and Bell Canada in Ontario and Quebec

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Table 4
Unbundled Local Loops In-service (Year-End) by Rate Band
for Bell Aliant in Atlantic Canada

#



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Q. What retail services are supported by wholesale Ethernet access and transport services, and/or by wholesale high-speed CDN access and transport services?

- a. For each of the years 2008 – 2013 provide the revenues generated by each of these retail services.**
- b. Provide your views as to whether the services identified above form part of the same retail product market, or if not, identify the separate product markets.**

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

- a) Our retail revenues are tracked based on the services actually purchased by retail customers, not based on the underlying network elements used in assembling the final end-user services. As a result we could not extract the information requested by the Commission directly. Nevertheless, Tables 1 and 2 provide revenues for those of our retail services which, to the best of our knowledge, substantially rely on high-speed DNA and Ethernet building blocks. We have excluded from our review retail services whose annual revenues did not reach \$1M. For Ontario and Quebec, we are only providing revenues for 2011 to 2013 as complete product information prior to 2011 is no longer available.

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Table 1
Bell Canada and Bell Aliant in Ontario and Quebec – Revenues in Millions

Service	2011	2012	2013
IPVPN	#	#	#
Ethernet Interworking	#	#	#
ATM	#	#	#
SIP Trunking	#	#	#
Business Internet Dedicated	#	#	#
Total	#	#	#

Table 2
Bell Aliant in Atlantic Canada – Revenues in Millions

Service	2008	2009	2010	2011	2012	2013
IPVPN	#	#	#	#	#	#
Ethernet Interworking	#	#	#	#	#	#
ATM	#	#	#	#	#	#
Business Internet Dedicated	#	#	#	#	#	#
Total	#	#	#	#	#	#

- b) High-speed DNA and Ethernet access and transport services are used to enable three broad types of retail services for our business customers.

First, they are primarily used to assemble high-speed data solutions for retail business customers. These high-speed data solutions represent the "new data protocols" category of services reported by the Commission in its Monitoring Report (CMR), in contrast to legacy protocols or consumer-grade Internet solutions. In Tables 1 and 2 above, they are represented by the IPVPN, Ethernet

Internetworking and ATM rows. Retail business customers primarily use such high-speed data solutions for the transmission of data between their own multiple locations in a closed network. For retail business users, these various new data protocols services are largely substitutable. A business customer is likely to be indifferent to the underlying technology that is used to provide any particular high-speed data service as long as the technology allows for very reliable, high-quality transmission at the required bandwidth and is cost effective. While business customers have been steadily switching away from legacy to new data protocols, which offer significantly different bandwidth, the various new data protocols built from high-speed DNA and Ethernet services offer comparable speeds of transmission. They should be treated as part of the same relevant product market when considering the alternatives available to business customers and the competitiveness of business services. Moreover, from a supply-side perspective, all these new data protocols can be offered over the same fibre infrastructure. As a result, once a provider has deployed or leased the fibre transport and access to offer one of these retail services, say IPVPN, it can easily offer any of the other new data protocol services, such as Ethernet Interworking, over the very same fibre infrastructure.

As can be seen from these tables, the revenue growth by Bell Canada and Bell Aliant between 2011 and 2013 for these new data protocol services is only #, which is similar to the growth rate of 8.0% for the industry over the same period as reported at page 201 of the 2014 CMR. This is consistent with the conclusions in Margaret Sanderson's expert report that "there is no evidence of an increasing share for Bell in the downstream retail markets."²

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² Page 29, Attachment 4 to Bell Canada's First Intervention.

Second, high-speed DNA and Ethernet can underlie dedicated fibre-based Internet access. This is represented by the Business Internet Dedicated row in the tables. This high bandwidth access service is a large business version of the consumer-grade Internet access services offered over DSL or FTTP. As illustrated by Figure 5.3.5 of the CMR 2014, in-territory telcos only account for 43% of the total business Internet access revenues and Bell Canada and Bell Aliant's revenues for Business Internet Dedicated services has been flat since 2011. This confirms the fact that forbearance of CDN and Ethernet has not impacted this product segment.

Finally, certain IP local voice services also build upon high-speed DNA or Ethernet, as represented by the SIP Trunking row in Table 1, which is an IP-based version of the traditional Primary Rate Interface. This is a nascent service for Bell Canada (and non-existent at this time for Bell Aliant). SIP Trunking forms part of the business local market and is currently subject to the Commission's retail business local voice forbearance framework, consistent with the Commission's view that all legacy and IP-based access-dependent business voice services form part of the same product market.³

*** End of Document ***

³ Decisions 2006-15 and 2008-10.

Q. For each of the respective CDN and Ethernet transport services offered by your company, provide the following:

- a. A list of competitors subscribed to the service in 2013**
- b. Total revenue received from each competitor**
- c. The monthly rate each competitor paid**

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

Since forbearance in 2011, services formerly rated as CDN-Metro Interexchange (IX) in Bell Canada and Bell Aliant's operations in Ontario and Quebec were blended in with our Digital Private Line Service (DPLS). Consequently, Metro IX services are no longer tracked and cannot be isolated from DPLS.

In line with the information Bell Canada submitted in response to Commission requests for information in December 2013, we have excluded inter-company transactions from the results.

¹ Broadcasting and Telecom Information Bulletin CRTC 2010-961, *Procedures for filing confidential information and requesting its disclosure in Commission proceedings*, dated 23 December 2010, as amended in BTIB 2010-961-1, dated 26 October 2012 to reflect the directives in Telecom Regulatory Policy CRTC 2012-592, *Confidentiality of information used to establish wholesale service rates*.

Tables 1 and 2 provide the requested information for each of the CDN and Ethernet transport services for Bell Canada and Bell Aliant's operations in Ontario and Quebec. We are providing the average rate in cases where a band and speed specific rate for any individual customer may differ by circuit or by month during the year.

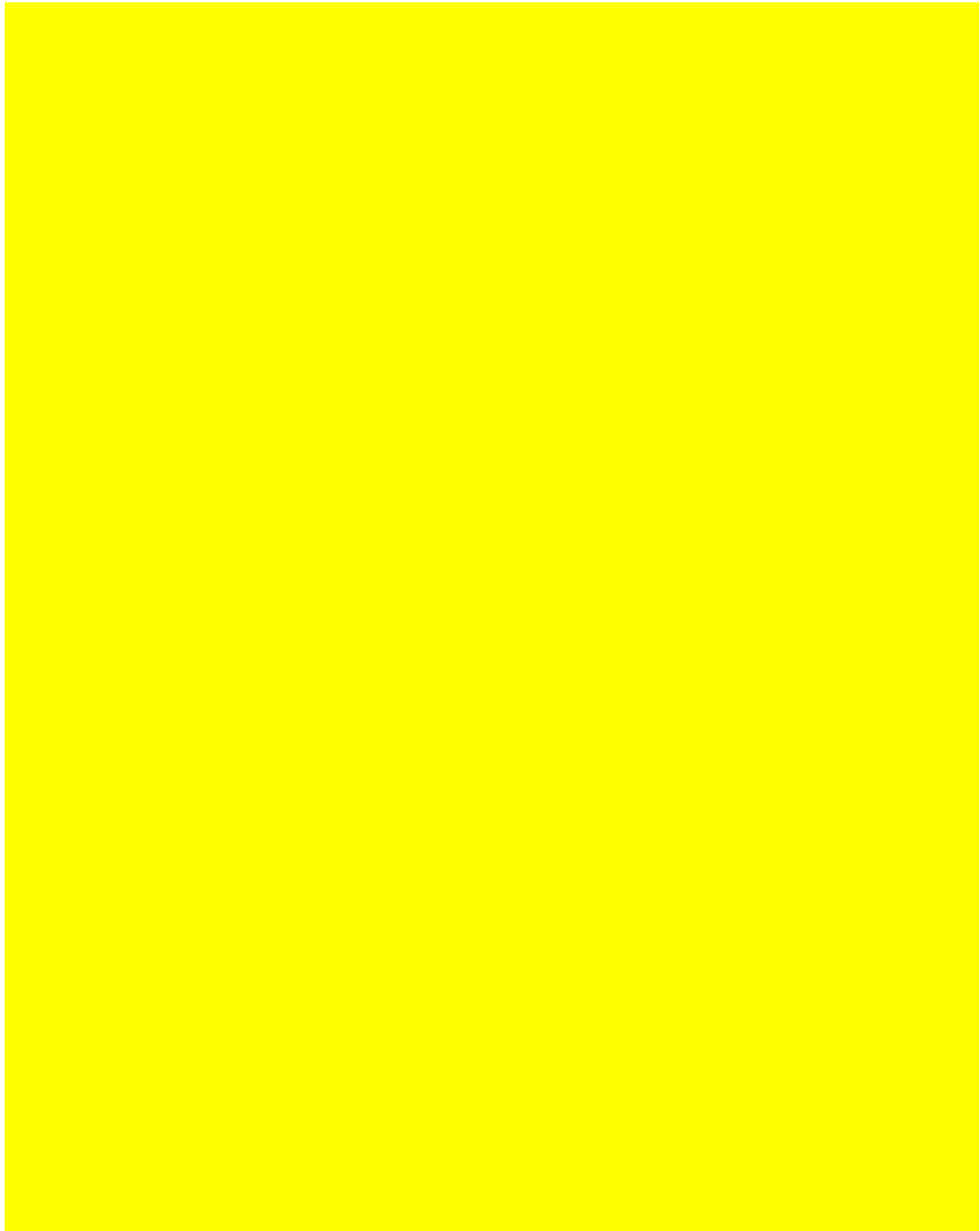
CDN Transport Services (Ontario and Quebec)

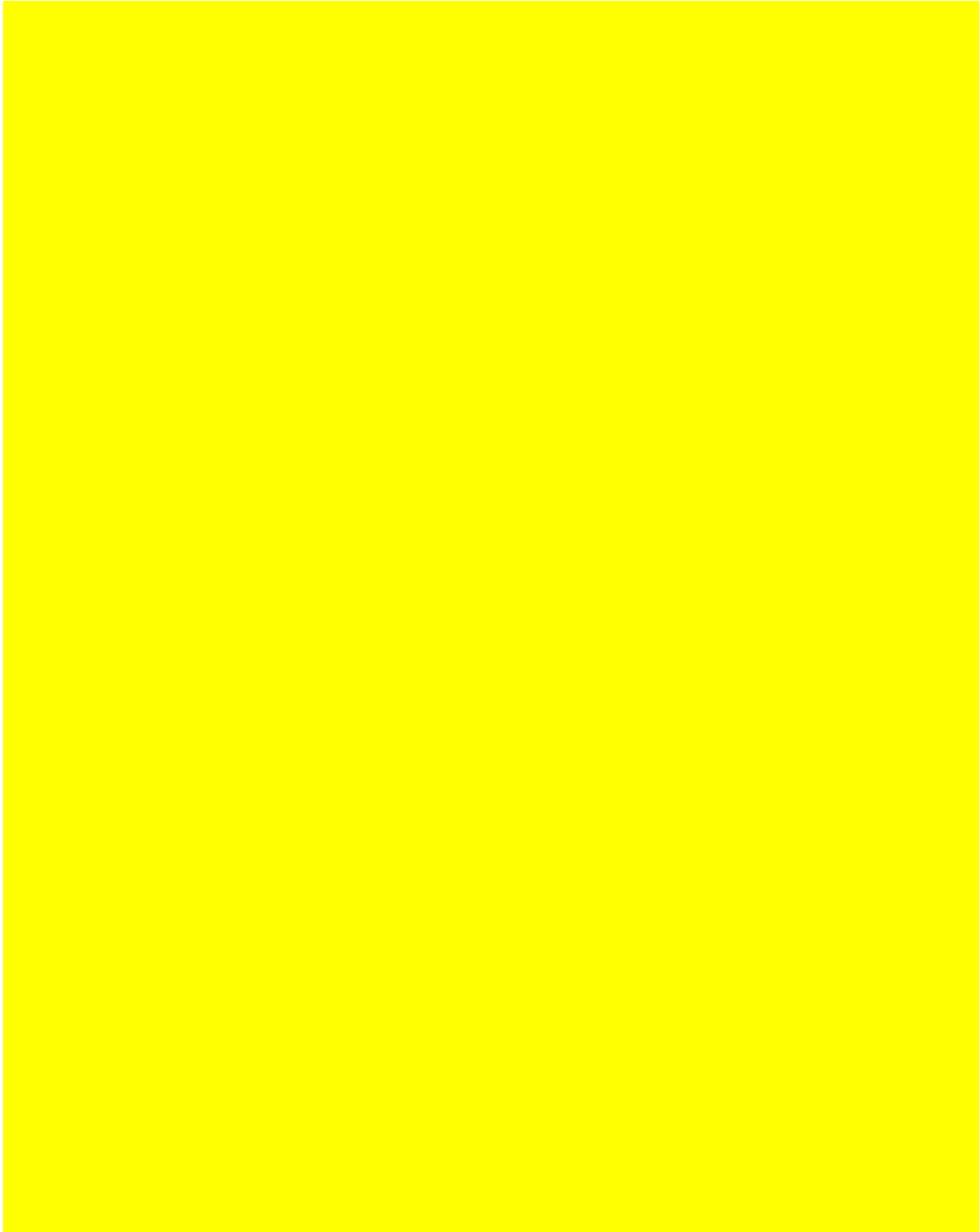
Table 1

Intra-Exchange Transport

#





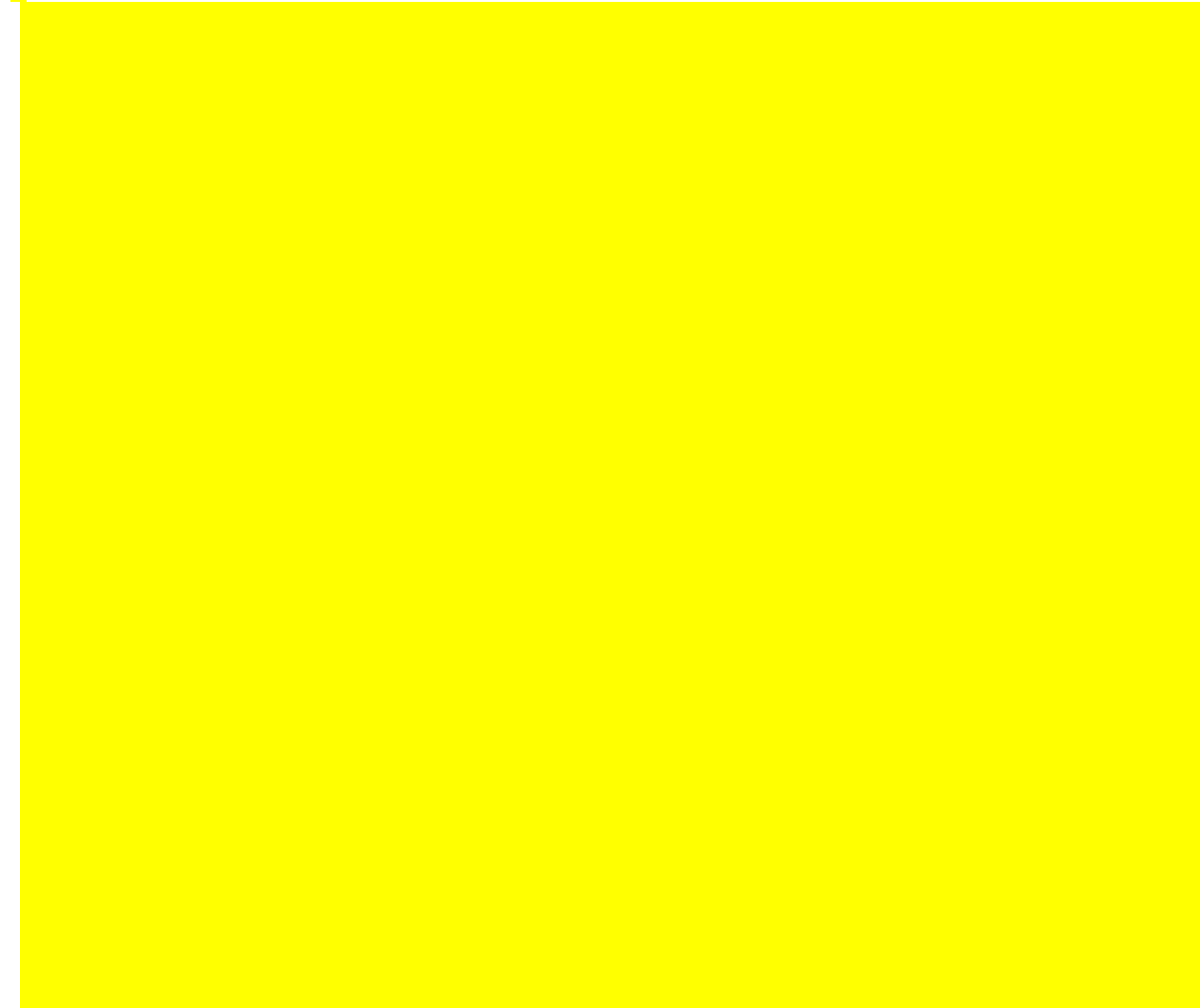


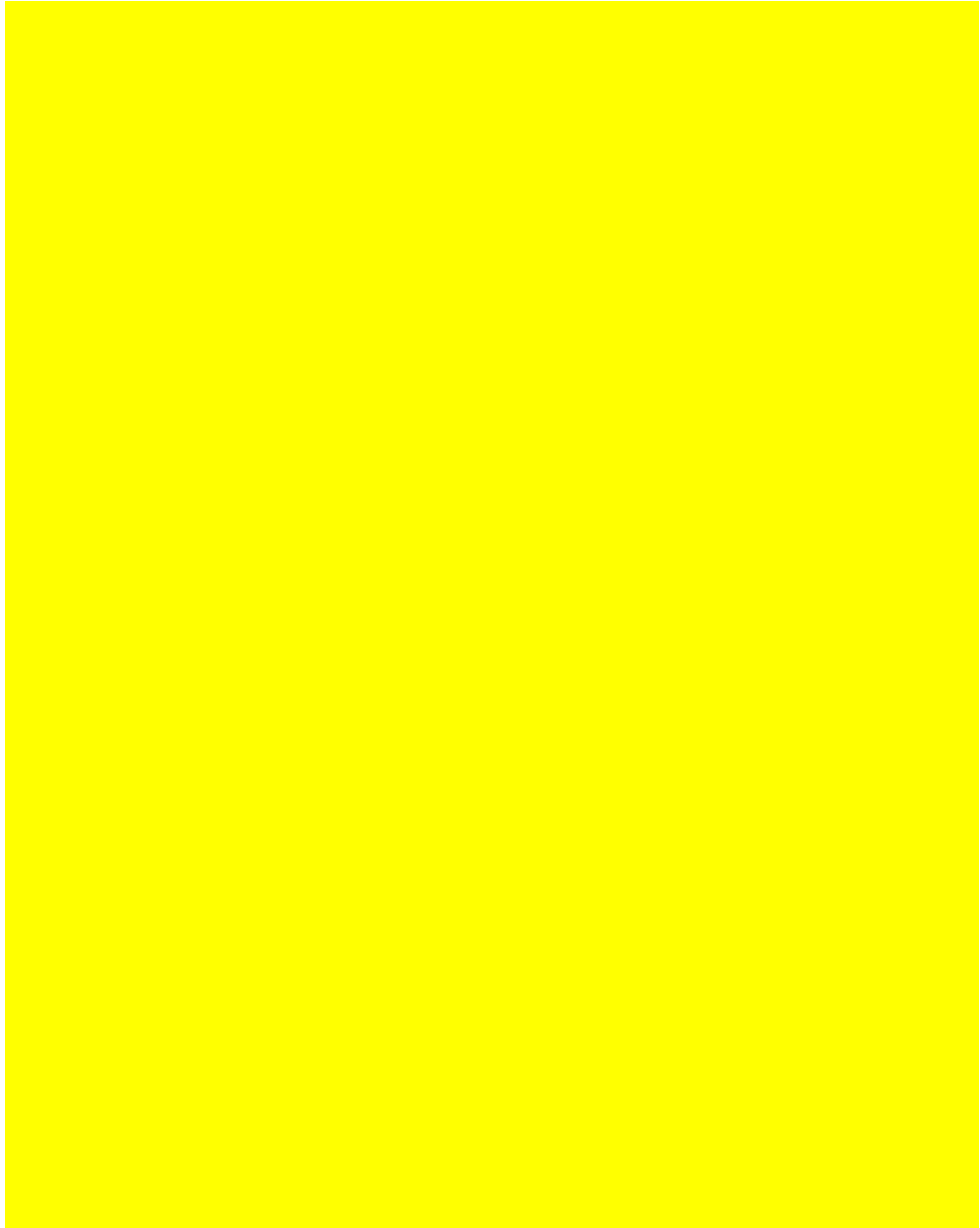


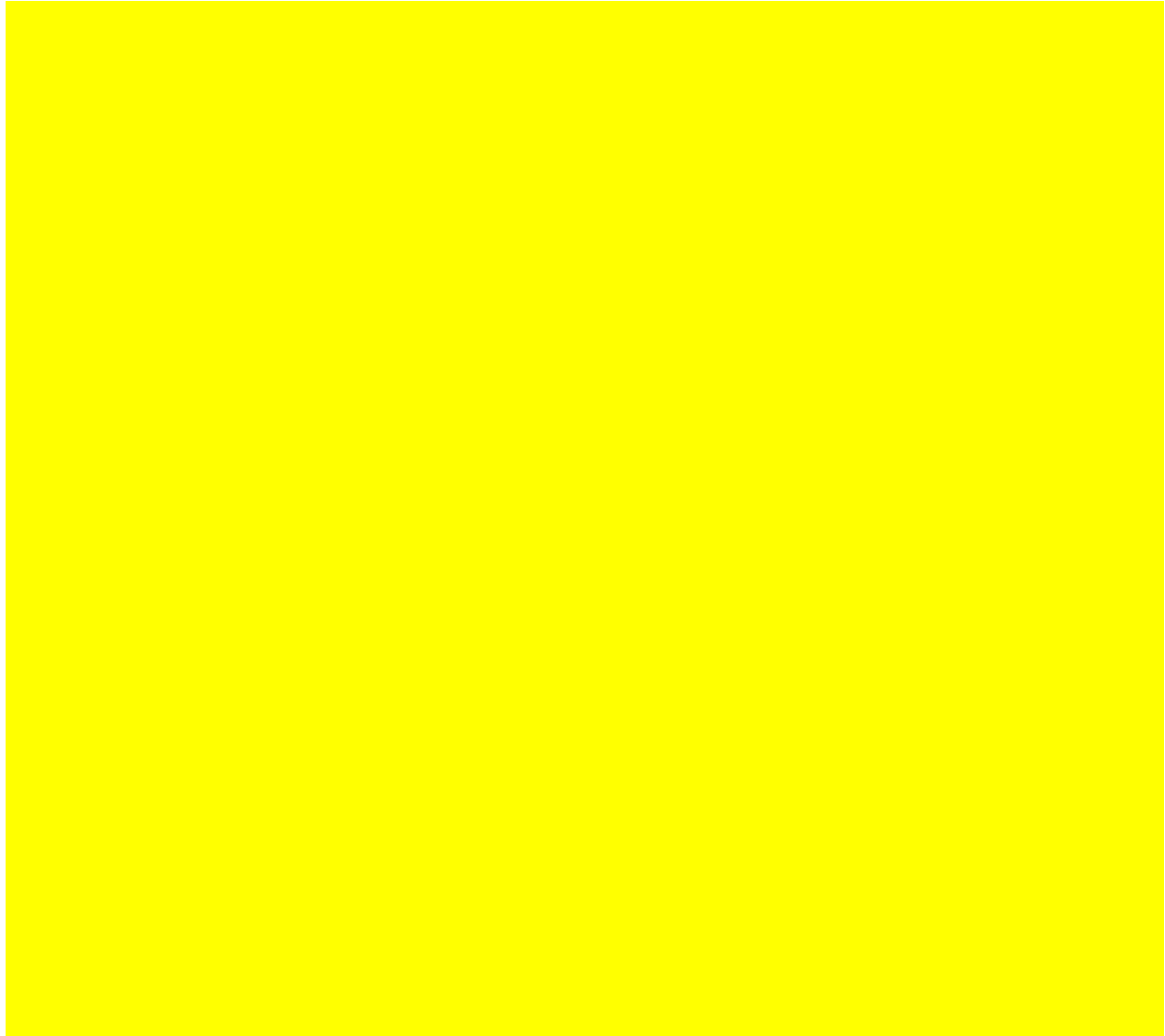
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Table 2
Ethernet Transport Paths (Ontario and Quebec)

#







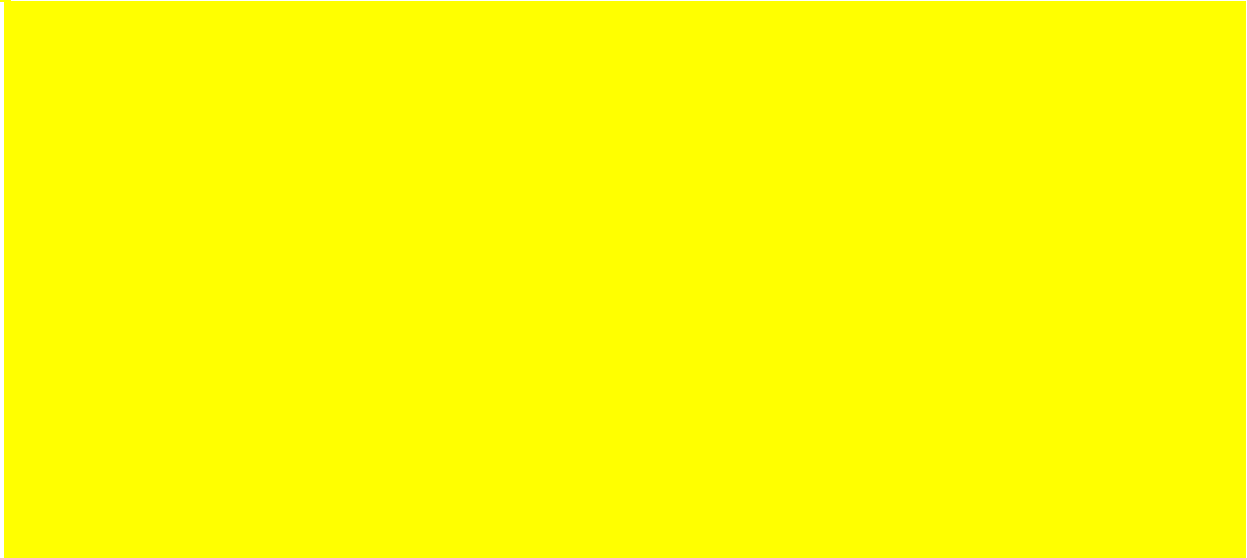
#

Tables 3a, 3b and 4 provide the requested information for each of the CDN and Ethernet transport services for Bell Aliant's Atlantic operations. We are providing the average rate in cases where a band and speed specific rate for any individual customer may differ by circuit or by month during the year.

CDN Transport Services (Aliant-Atlantic)

Table 3a
Intra-Exchange Transport

#



#

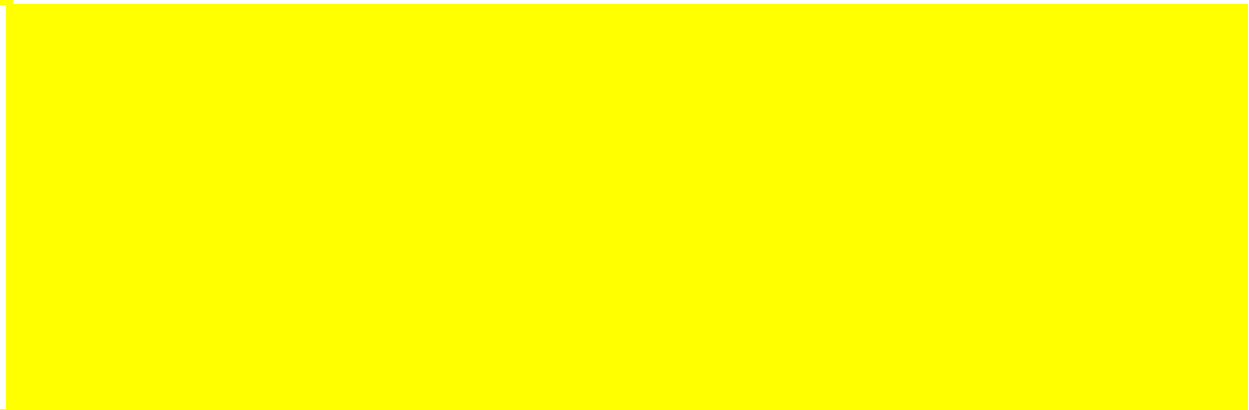
Table 3b
Metro Inter-Exchange (IX) Transport

#



Table 4
Ethernet Transport Paths (Aliant-Atlantic)

#

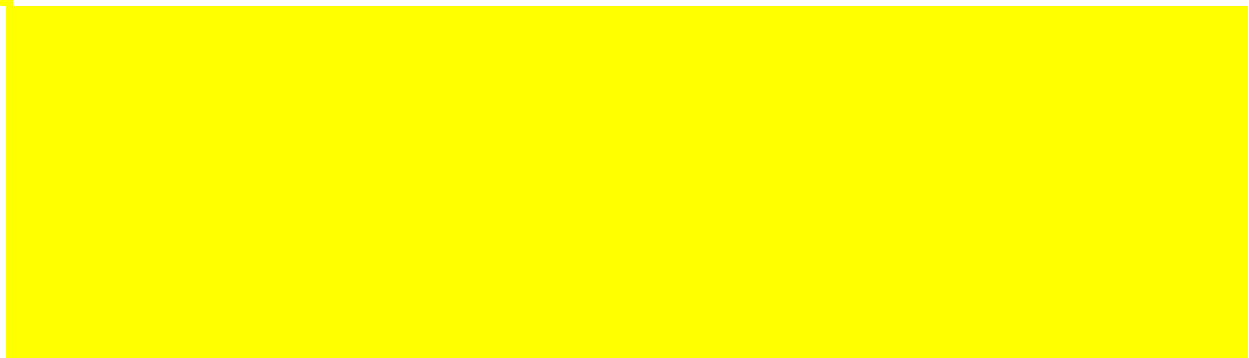


#

Table 5 provides the requested information for the Ethernet transport services for Bell Aliant's Télébec operations. We are providing the average rate in cases where a band and speed specific rate for any individual customer may differ by circuit or by month during the year. Télébec has never had a tariffed CDN service.

Table 5
Ethernet Transport Paths (Télébec)

#



#

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Q. For each of the years 2008-2013 provide the total number of facilities your company uses out-of-territory and the percentage of those facilities that are self-supplied.

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

Outside our incumbent operating territory, Bell Canada wireline services are provisioned using a combination of self-supplied and leased access and transport services from the in-territory ILEC as well as other third-party providers of similar services. While we have visibility to those locations where we can provision services over our own self-supplied facilities as identified in Bell Canada(CRTC)31Jul14-1 b) and c), this information is limited. It is not available historically and is limited to data circuit quantities which are not capacity specific.

¹ Broadcasting and Telecom Information Bulletin CRTC 2010-961, *Procedures for filing confidential information and requesting its disclosure in Commission proceedings*, dated 23 December 2010, as amended in BTIB 2010-961-1, dated 26 October 2012 to reflect the directives in Telecom Regulatory Policy CRTC 2012-592, *Confidentiality of information used to establish wholesale service rates*.

We reviewed our existing leased access and transport elements using the same aggregated data circuit view used to inventory our self-supplied facilities. Based on this analysis, we estimate that at the present time we utilize approximately [REDACTED] # circuits to enable our out-of-territory operations of which [REDACTED] # are provisioned using self-supplied facilities. We estimate that, on a bandwidth provisioned basis, a larger percentage would be self-supplied as we invest more in higher-bandwidth facilities than in lower-bandwidth ones. We are, however, unable to provide an estimated self-supply figure based on bandwidth.

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*** End of Document ***

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(Transcript Ref: Vol. 3, Paragraphs 3311 to 3321 and 4043 to 4047)

- Q. MS DIONNE: With respect to BAS implementation, I want to clarify which you will undertake to provide to the Commission. As mentioned by Vice Chair Menzies, competitors will likely request a mandated BAS service at only certain COs or head-ends and at different times and they might not use the service at all of the incumbent sites. In light of this, explain how Bell, through an undertaking if you wish, explain how Bell would propose that such a service be implemented in the event that its provision is mandated. Also, and given these same assumptions, provide Bell's views on how it should be compensated for the associated start-up costs, for example recovered up front from the first requester or recovered in a monthly rate, and provide these costs with underlying assumptions in devising these anticipated costs.**
- A. See The Companies – Undertaking #2 TNC 2013-551.

*** End of Document ***

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(Transcript Ref: Vol. 3, Paragraphs 3485 to 3498 and 4049 and 4050)

Q. Ms. Dionne: And I would like to clarify another undertaking discussed with Vice-Chair Menzies. Can you undertake to provide an explanation as to how and under what circumstances would raising the value ascribed to a company's cost of capital would result in lowering the overall rate resulting from the Phase II exercise?

A. During his exchange with Vice-Chair Menzies, Mr. Daniels explained our position that the mark-up is the most appropriate and direct way to ensure that we receive adequate compensation for additional risk rather than an increase in the Cost of Equity. As Mr. Daniels pointed out in his testimony, there are even circumstances where an increase in the Cost of Equity, which leads to an increase in the After-Tax Weighted Average Cost of Capital (AT-WACC) that is used in cost studies, would actually lower the cost-based rate, rather than result in an increase. Below we explain why that can occur.

First, we note that in an economic study undertaken to establish a cost-based rate for a regulated wholesale service, the cost per unit of demand over the study period is calculated by dividing the Present Worth of Annualized Costs (PWAC) by the Present Worth of Demand (PWOD). This unitized cost is then used to determine the rate that would apply to each unit of demand on a going-forward basis. The final rate is set by applying a Commission-mandated mark-up percentage to the unitized cost:

$$\text{Rate for a cost-based wholesale service} = \text{PWAC} / \text{PWOD} * (1 + \text{mark-up percentage})$$

In order to understand how a change in the Cost of Equity affects the PWAC and the per unit cost, it is first important to understand the relationship between the Cost of Equity and the AT-WACC that is used in the cost studies. The AT-WACC is a function of the Cost of Equity, the regulated Common Equity ratio, the Cost of Debt and certain other factors. Given that the regulated Common Equity ratio for Bell Canada and most other ILECs is set by the Commission at 55%, an increase of one percentage point in the Cost

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of Equity translates into only a 0.55 percentage point increase in the AT-WACC. As such, there is not a one-to-one, direct relationship between the Cost of Equity and the AT-WACC.

The AT-WACC itself is used as a discount rate in an economic study to express all cash flows and demand over the study period as discrete equivalent amounts as of the beginning of the study period. An increase in the AT-WACC sometimes results in higher costs, sometimes leads to the same costs, and sometimes leads to a decline in the costs. The impact of an increase in the AT-WACC on the cost is influenced by a number of factors. These include the types of cash flows in the study, namely expense and/or capital cash flows which are subject to different income tax treatments and the timing of the cash flows. As well, the impact of an increase in the AT-WACC on the costs differs for capital cash flows depending on whether the capital is subject to the calculation of a terminal value or not.¹

The different outcomes are illustrated in Table 1 below which summarizes the results of six hypothetical scenarios which compare the results of using an AT-WACC of 10% and an AT-WACC of 10.55% (which reflects a one percentage point increase in the Cost of Equity based on the regulated Common Equity ratio being 55%). The scenarios provided show the results in cases where there are different cash flows involving expense only or capital only (with and without a terminal value). The last column of the table shows the percentage change in costs that would result from a one percentage point increase in the Cost of Equity.

¹ Terminal value is also known as end of study (EOS) value. Terminal value is generated when a capital cash flow has not reached its end of life at the end of the study period and the asset is useful after the study period. Thus, an EOS credit is applied to the capital cash flow.

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The results demonstrate that a one percentage point increase in the Cost of Equity could result in the unitized cost increasing, decreasing, or staying the same. Thus, instead of compensating for the increased risk, there would be situations where the actual cost-based rate, if the Cost of Equity were adjusted, would actually decrease, or would stay the same, which would clearly not be an acceptable outcome. As such, increasing the Cost of Equity does not always give the desired results of increasing the cost-based rate to compensate for increased risk. In contrast, if the mark-up is increased by one percentage point, then the cost-based rate also increases by one percentage point, as the mark-up is applied directly to the overall cost. In this case, there is no uncertainty on the impact that a single percentage point increase in the mark-up would have on rates contrary to the situation where there is an increase in the Cost of Equity.

Table 1

Summary of Unitized Costs* based on Hypothetical Cash Flow Scenarios			
Type of cash flows and timing of the cash flows	Unitized Costs using a 10% AT-WACC	Unitized Costs using a 10.55% AT-WACC**	Percent change because of increase in the AT-WACC from 10% to 10.55%
Expense Only:			
Expense in the last year	\$13.72	\$13.57	-1.09%
Expense each year	\$16.76	\$16.76	0.00%
Capital Only with Terminal Value***:			
Capital in the last year	\$1.77	\$1.77	0.28%
Capital each year	\$10.54	\$10.65	1.04%
Capital Only with no Terminal Value (EOS value):			
Capital in the last year	\$14.37	\$14.26	-0.76%
Capital each year	\$18.06	\$18.13	0.34%

* A unitized cost is calculated as PWAC/PWOD.

** The AT-WACC of 10.55% reflects an increase in the Cost of Equity of one percentage point, relative to the Cost of Equity used to generate the AT-WACC of 10%.

*** Terminal value is also known as EOS value. Terminal value is generated when a capital cash flow has not reached its end of life at the end of the study period and the asset is useful after the study period. Thus, an EOS credit is applied to the capital cash flow.

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The circumstances which explain the direction of the impact of a one percentage point increase in the Cost of Equity on the per unit, or unitized, costs (i.e., the ratio of PWAC/PWOD) for the scenarios shown in Table 1 are discussed below.

Expense Only Scenarios: Impact on expense cash flows

For expense cash flows, an increase in the AT-WACC would typically result in a decrease in both the numerator (PWAC) and the denominator (PWOD). However, the ratio of PWAC/PWOD (i.e., the unitized cost) could increase, decrease or stay the same. Illustrative examples which demonstrate that increases in the Cost of Equity could lead to a decrease in the unitized cost, or result in the unitized cost staying the same are provided below. Under either situation, in terms of compensating us for the increased risk, the outcome would be unacceptable.

The unitized cost could decrease

If the profile of the service-driven expenses tends to be skewed toward the end of the study period, then the decrease in the PWAC would be proportionately more than the decrease in the PWOD and the unitized cost would decrease.

Numerical example:

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	AT-WACC 10.00%	AT-WACC 10.55%	% Change
Expense	-	-	-	-	\$1,000	PWAC = \$654.95	PWAC = \$640.44	-2.22%
Demand	12	12	12	12	12	PWOD = 47.73	PWOD = 47.18	-1.14%
						Unit cost = \$13.72	Unit cost = \$13.57	-1.09%

The unitized cost could stay the same

If all expenses are driven by demand (i.e., there is a constant relationship between the expenses and the demand) then the decrease in the PWAC and the PWOD would be proportional and the unitized cost would stay the same.

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Numerical example:

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	AT-WACC 10.00%	AT-WACC 10.55%	% Change
Expense	\$200	\$200	\$200	\$200	\$200	PWAC = \$799.70	PWAC = \$790.59	-1.14%
Demand	12	12	12	12	12	PWOD = 47.73	PWOD = 47.18	-1.14%
						Unit cost = \$16.76	Unit cost = \$16.76	0.00%

Clearly, under either scenario, the compensation for the additional risk by having adjusted the Cost of Equity by one percentage point would not be acceptable, as the cost-based rate would either decline or stay the same as without the adjustment.

Impact on capital cash flows subject to the calculation of a terminal value

For capital cash flows subject to the calculation of a terminal value, an increase in the AT-WACC would typically result in an increase in the numerator (PWAC) and a decrease in the denominator (PWOD) resulting in an overall increase in the unitized cost. However, the magnitude of the impact would be unpredictable as it would vary based on the profile of capital cash flows relative to the profile of demand (and would thus depend on the mix of service-driven and demand-driven capital costs). Taking the same numerical examples as for expense cash flows, but with capital cash flows subject to the calculation of a terminal value, the results are as follows:

Numerical example with service driven capital skewed towards the end of the study period:

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	AT-WACC 10.00%	AT-WACC 10.55%	% Change
Capital	-	-	-	-	\$1,000	PWAC = \$84.45	PWAC = \$83.73	-0.86%
Demand	12	12	12	12	12	PWOD = 47.73	PWOD = 47.18	-1.14%
						Unit cost = \$1.77	Unit cost = \$1.77	0.28%

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Numerical example with demand driven capital:

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	AT-WACC 10.00%	AT-WACC 10.55%	% Change
Capital	\$200	\$200	\$200	\$200	\$200	PWAC = \$502.93	PWAC = \$502.35	-0.12%
Demand	12	12	12	12	12	PWOD = 47.73	PWOD = 47.18	-1.14%
						Unit cost = \$10.54	Unit cost = \$10.65	1.04%

Impact on capital cash flows not subject to the calculation of a terminal value

For capital cash flows that are not subject to the calculation of a terminal value, an increase in the AT-WACC could result in either an increase or a decrease in the unitized cost. The magnitude of the impact would also be unpredictable as it would vary as a function of the profile of capital cash flows relative to the profile of demand (and would thus depend on the mix of service-driven and demand-driven capital costs). Taking the same set of numerical examples as above and applying it to this situation yields the following results.

Numerical example with service-driven capital skewed towards the end of the study period:

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	AT-WACC 10.00%	AT-WACC 10.55%	% Change
Capital	-	-	-	-	\$1,000	PWAC = \$686.06	PWAC = \$673.08	-1.89%
Demand	12	12	12	12	12	PWOD = 47.73	PWOD = 47.18	-1.14%
						Unit cost = \$14.37	Unit cost = \$14.26	-0.76%

Numerical example with demand-driven capital:

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	AT-WACC 10.00%	AT-WACC 10.55%	% Change
Capital	\$200	\$200	\$200	\$200	\$200	PWAC = \$862.19	PWAC = \$855.30	-0.80%
Demand	12	12	12	12	12	PWOD = 47.73	PWOD = 47.18	-1.14%
						Unit cost = \$18.06	Unit cost = \$18.13	0.34%

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Again, these situations highlight the fact that if the Cost of Equity were adjusted for the higher risk, we would not receive adequate compensation for the additional risk via the cost-based rate under either scenario.

SUMMARY AND CONCLUSION

In summary, the direction of the impact of an increase in the Cost of Equity on the cost per unit of demand depends on multiple factors:

- the mix of capital and expense cash flows;
- for capital cash flows, whether they are subject to the calculation of a terminal value or not; and
- the profile (or timing) of service-driven expenses.

whereas the magnitude of the impact also depends on the mix of service-driven and demand-driven costs. Therefore, increases in the Cost of Equity to capture higher risk do not lead to predictable result in terms of either the direction or the magnitude of the impact.

In contrast, both the direction and the magnitude of an increase in the mark-up percentage on the cost-based rate are predictable. As such, capturing the risk of an initiative through the mark-up is more direct, straightforward and more appropriate than through the Cost of Equity.

Overall, we submit that if the purpose is to reflect greater risk, then that risk should be reflected in the price. The Cost of Equity is not a reflection of the risk, as it is just a cost of raising funds on a corporate-wide basis. We do not have a Cost of Equity for each individual initiative. As evident from the examples provided above, adjustments to the Cost of Equity do not necessarily result in price increases and thus cannot be counted

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upon to ensure a higher price that reflects the increased risk. Clearly the mark-up is the most appropriate way to reflect the impact of greater risk on the price.

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(Transcript Ref: Vol. 3, Paragraph 3520)

Q. Commission Menzies: Now, we have heard -- we hear frequently, too, about lack of detail in our decisions regarding our reasons for adjustments made to cost studies. Now, given the confidential nature of the data, is there anything we can do in that area to make things better?

A. At the outset we note that in most Commission decisions that address the setting of cost-based rates for carriers' wholesale service(s), the Commission generally makes a number of adjustments to the underlying costs that the carrier submitted in support of its rate proposal, and accordingly adjusts the proposed rate. In addition, Commission decisions do not provide a lot of information on the adjustments the Commission has made to the cost studies. While they generally identify the adjustments at a high level, and provide their collective impact on the overall cost and final rate, they do not identify all of the pertinent information related to each adjustment to be able to, for example, replicate the adjustments. As well, the decisions do not always provide full rationale for having made the adjustments in the first place.

We note that while there is significantly more costing detail that is placed on the public record since the issuance of the Commission's most recent decision on disclosure guidelines,¹ as Mr. Daniels noted during his exchange with Vice-Chair Menzies, there are still a number of disaggregated cost inputs and other cost related information that are indeed competitively sensitive. Understandably, it is not possible for the Commission to disclose full detail about adjustments, such as the values of the adjustments and the specific inputs and calculations that may have been used to determine those values, if this would involve the disclosure of confidential information. Thus, we acknowledge that the amount of detail that could be put in decisions that are available to the public is going to be limited.

¹ As set out in Broadcasting and Telecom Information Bulletin CRTC 2010-961.

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(Transcript Ref: Vol. 3, Paragraph 3520)

In terms of suggestions as to how to improve the process of addressing cost adjustments in Commission decisions, we recommend that the Commission adopt a more consistent process across all decisions that involve rate-setting proceedings where such adjustments were made. Specifically, we propose that in each such decision, the Commission continue the practice of identifying the adjustments it has made, and provide as much rationale and detail about the adjustments while respecting the confidential nature of information that was filed. It would be helpful as well if the Commission identified the costing scenario that served as the base for the adjustments.

Examples of recent decisions where the Commission has provided such information (in Appendices to the decisions) include Decision 2010-900,² Decision 2013-659,³ and Telecom Regulatory Policy CRTC 2011-703⁴ and 2011-704,⁵ although again the level of detail was limited due to confidentiality issues.

In order to permit carriers to replicate the cost adjustments in cases where the replication would involve the use of confidential information, we propose that the Commission consider having staff issue a confidential memo to the carrier(s) who filed the costs with further detail. In this memo, which would be provided only to the carrier(s) who developed the cost study, staff would provide additional detail about the manner in which each cost adjustment was made and identify the value of each adjustment, along with any other information that would permit replication of the adjustment.

*** End of Document ***

² Telecom Decision CRTC 2010-900, *Review of the large incumbent local exchange carriers' support structure service rates*.

³ Telecom Decision CRTC 2013-659, *Review of outstanding wholesale high-speed access service issues related to interface rates, optional upstream speed rates, and modem certification requirements*.

⁴ Telecom Regulatory Policy CRTC 2011-703, *Billing practices for wholesale residential high-speed access services*.

⁵ Telecom Regulatory Policy CRTC 2011-704, *Billing practices for wholesale business high-speed access services*.

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(Transcript Ref: Vol. 3, Paragraph 3818)

- Q. Commissioner Shoan: Can you provide your thoughts on annual reporting with respect to network investments? There seems to be an expressed concern that if service were mandated in this proceeding it will not result in additional network investments if we were to have an annual reporting requirement for those taking advantage of those mandated services to demonstrate whether they had conducted network investments at the last mile, the middle mile, the first mile, what have you.**
- A. The tables below list our recommended annual filing requirements for the ILECs, cablecos, and all other facilities-based providers listed on the Commission's non-dominant carriers list. These suggested requirements have been crafted in consideration of the availability of the requested information and the usefulness of the information for the Commission to track the efficacy of the regulatory framework to incent investment in access facilities. In particular, capital expenditures are already reported on Form 104 by carriers with over \$10M of annual telecommunications revenue, as part of the Commission's annual data collection exercise and hence should be readily available for these carriers.¹ In order to enable the Commission to monitor the efficacy of their policies to incent investment in next generation facilities, we recommend that all facilities-based carriers who are building access facilities, including those with less than \$10M of annual telecommunications revenue, supply investment information and that notably the wireline category from Form 104 be further disaggregated to report separately results for FTTP/H, Fibre to the commercial building (FTTB), FTTN, hybrid fibre/coax facilities, and ADSL/legacy facilities.

It is recommended that the Commission also track information regarding homes passed by technology as an additional means of monitoring the efficacy of the regulatory regime in expanding the footprint of next generation technologies. In order to avoid double counting of homes passed by a carrier and effectively monitor the expansion of next

¹ On Form 104 carriers provide capital expenditures for the following broad categories: wireline, fixed wireless satellite, wireless and other.

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CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION
(Transcript Ref: Vol. 3, Paragraph 3818)

generation technologies, in cases where a carrier has overbuilt a newer technology in an existing neighbourhood, it is recommended that the houses passed number be only counted against the newest technology deployed. For example where FTTP technology is deployed in an existing neighbourhood served by FTTN technology those homes passed will only be included in that carrier's count of FTTP homes passed.

In order to track activities by incumbents versus those by non-incumbent entrants it is recommended that ILECs and cablecos report separately for the areas in which they operate as an incumbent from where they are operating out-of-territory.

As previously acknowledged by the Commission and verified by the evidence presented in this proceeding, transport facilities (i.e. intra city and inter city facilities) are duplicable and subject to a high degree of competitor self-supply or supply from third parties. There is no need for the Commission therefore to incent investment in these facilities. Furthermore for carriers to include investment in these facilities with the numbers reported regarding investment in access facilities would distort the data reported and could provide a misleading indicator to the Commission regarding the efficacy of the regulatory regime to incent investment in access facilities.

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(Transcript Ref: Vol. 3, Paragraph 3818)

Suggested Annual Filing Requirement by ILECs and Cablecos

Table 1
Information to be supplied by ILECs and Cablecos for their incumbent territories

Technology	Access Network Capital Expenditures (previous calendar year)	Homes Passed
FTTP/H		
FTTB		
FTTN		
Hybrid fibre/coax		
Fixed wireless		
ADSL/legacy technologies		
Other (specify)		

- Notes: 1) Access is defined to include the facilities from the nearest central office/head-end equivalent to the end-customer.
- 2) FTTB includes all commercial buildings.
- 3) In cases where a carrier has overbuilt a new technology in an existing neighbourhood the homes passed in that neighbourhood are to be counted against the newest technology deployed.
- 4) In order to provide sufficient time to collect the information, it is recommended that the information be provided at mid-year each year for the previous calendar year.

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Table 2:
Information to be supplied by ILECs and Cablecos for outside their incumbent territories and by each facilities-based carrier on the Commission's non-dominant carrier list that has built access facilities during the relevant period

Technology	Access Network Capital Expenditures (calendar year)	Homes Passed
FTTP/H		
FTTB		
FTTN		
Hybrid fibre/coax		
Fixed wireless		
ADSL/legacy technologies		
Other (specify)		

- Notes:**
- 1) Access is defined to include the facilities from the nearest central office/head-end equivalent to the end-customer.
 - 2) FTTB includes all commercial buildings.
 - 3) In cases where a carrier has overbuilt a new technology in an existing neighbourhood the homes passed in that neighbourhood are to be counted against the newest technology deployed.
 - 4) In order to provide sufficient time to collect the information, it is recommended that the information be provided at midyear each year for the previous calendar year.

*** End of Document ***

INFORMATION REQUESTED BY
CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION
(Transcript Ref: Vol. 3, Paragraph 4031)

Q. Ms. Dionne: With respect to Bell Canada's deployment of FTTP in Quebec City, can Bell Canada undertake to provide the number of customers that subscribe to a bundle of two, three and four services respectively, as well as the proportions of subscribers to these various bundles relative to the total customer base served by your FTTP network in Quebec City?

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

As indicated by Mr. Bibic during his 26 November 2014 testimony, “[a]t Bell roughly 50 percent of our - so I'm going to put aside DTH and wireless because those are separate networks we are talking about, the wireline Internet network - approximately 50 percent of our subscribers buy just one service, 30 percent buy two services and approximately 20 percent buy a triple. So it's much more heavily weighted towards single product.” The confidential data submitted here confirms his statement.

Table 1 provides the number of residential FTTP subscribers in Quebec City that subscribe to one, two or three Bell Canada wireline products as well the proportion of

¹ Broadcasting and Telecom Information Bulletin CRTC 2010-961, *Procedures for filing confidential information and requesting its disclosure in Commission proceedings*, dated 23 December 2010, as amended in BTIB 2010-961-1 to reflect the directives in Telecom Regulatory Policy CRTC 2012-592, *Confidentiality of information used to establish wholesale service rates*.

INFORMATION REQUESTED BY
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(Transcript Ref: Vol. 3, Paragraph 4031)

these subscribers to the total customer base served by our FTTP network in Quebec City. We also provide the similar proportion of residential subscribers based on the total customer base served by Bell Canada's legacy, FTTN and FTTP networks. Consistent with Mr. Bibic's statement which prompted the Commission's request for information, the information provided excludes subscriptions to wireless or Direct-to-Home satellite services.

Table 1

	Number of Quebec City FTTP subscribers	% of Quebec City FTTP subscribers	% of Bell Canada total subscribers
One product	#	#	49%
Two products	#	#	31%
Three products	#	#	20%

As we indicated throughout this proceeding, the FTTP business case is predicated on winning the broadband home in order to fund the FTTP capital investment through the revenues associated with all three wireline services. As a result, while the take up of bundles in Quebec City among our FTTP subscribers is # [REDACTED] #, the penetration rate for FTTP there is only [REDACTED] #, with the result that the success of the Quebec City business case remains unproven.

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INFORMATION REQUESTED BY
CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION
(Transcript Ref: Vol. 3, Paragraph 4052)

Q. Ms. Dionne: Last question. In response to a question from Commissioner Molnar you indicated that of the 20 percent of the former Bell Aliant network footprint provisioned over ATM technology, a substantial proportion of that footprint was contested by cable competitors.

Can you undertake to quantify the extent of these overlapping footprints and also to indicate what proportion of your ATM footprint is contested by cable competitors utilizing DOCSIS 3 technology?

A. In subsequent discussions with Commission counsel, we clarified that the undertaking pertained to Bell Canada territory, not Bell Aliant. Nevertheless we are providing a response in respect both of Bell Aliant Atlantic and of the combined Bell Aliant and Bell Canada in Ontario and Quebec. Table 1 provides the percentage of cable overlap in areas where we only offer ATM broadband, as well as the estimated percentage of cable coverage utilizing DOCSIS 3.0 technology.

Table 1
Percentage of ATM footprint with cable overlap

	Cable Overlap	Cable Overlap: DOCSIS 3.0
Atlantic	100%	99%
Ontario/Quebec	98%	97%

*** End of Document ***

INFORMATION REQUESTED BY
CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION
(Transcript Ref: Vol. 3, Paragraph 4037)

- Q. Ms. Dionne: Mr. Bibic, you have indicated that following phase-out of the mandated status of high-speed CDN services and associated forbearance, all negotiated agreements reached with respect to the provision of these services were settled at rates below prevailing retail rates. Can you undertake to provide us with the data supporting this position, meaning the wholesale rates provided for each customer and prevailing retail rates?**
- A. Certain information contained in this response and the related Attachment is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged versions of this response and the Attachment are provided for the public record.

We already provided, in Bell Canada(CRTC)28Mar14-23, information about the high and low rates paid by our customers for the previously tariffed CDN and Ethernet services. The Attachment adds the rates applicable for the retail equivalents of CDN and Ethernet.

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As the Attachment shows, the range of rates negotiated for CDN and Ethernet lies below the retail rates except for three small exceptions. #

[REDACTED]

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*** End of Document ***

A. CDN- DS-3 Access

Service	Rate Band	New Information		Information filed with CRTC			
		Retail Tariff		Rate Band	Monthly Recurring Rate		
		1st	Add'l		Pre(Tariff)	Low	High
DS3 Access	0	\$2,100	\$1,275	A	\$462.57	#	#
	1	\$2,100	\$1,275	B	\$504.79	#	#
	2	\$2,390	\$1,435	C	\$450.11	#	#
	3	\$2,655	\$1,595	D	\$472.31	#	#

B. CDN- OC-3 Access

Service	Rate Band			Rate Band	Monthly Recurring Rate		
					Pre(Tariff)	Low	High
OC3 Access	0		\$4,060	A	\$1,027.10	#	#
	1		\$4,320	B	\$1,445.40	#	#
	2		\$5,000				
	3		\$5,500				

C. CDN- OC-12 Access

Service	Rate Band			Rate Band	Monthly Recurring Rate		
					Pre(Tariff)	Low	High
OC12 Access	0		\$7,575	A	\$2,563.72	#	#
	1		\$7,700	B	\$3,012.51	#	#
	2		\$8,750				
	3		\$9,650				

D. CDN- Intra-exchange transport (include all speeds)

Service	Rate Band			Pre(Tariff)	Low	High
DS0 Intra			\$29.00	\$3.10	#	#
DS1 Intra			\$240.00	\$59.56	#	#
DS3 Intra			\$1,000.00	\$760.63	#	#
OC3 Intra			\$1,430.00	\$1,439.58	#	#
OC12 Intra			\$4,400.00	\$4,429.48	#	#

E. CDN- Metro Interexchange transport (include all speeds)

Service	Rate Band			Pre(CDN Tariff)	Low	High
DS0 Metro IX			default is retail tariff	\$3.45	#	NST 307.4 #
DS1 Metro IX			default is retail tariff	\$41.33	#	NST 307.4 #
DS3 Metro IX			default is retail tariff	\$371.82	#	NST 307.4 #

F. CDN- CO Channelization (include all speeds)

Service	Rate Band			Pre(Tariff)	Low	High
DS1-DS0 Channelization	A	99		\$47.18	#	#
	B			\$31.14	#	#
	C			\$48.16	#	#
	D			\$48.16	#	#
	E			\$48.16	#	#
	F			\$48.16	#	#
DS3-DS1 Channelization	A	500		\$512.04	#	#
	B			\$363.81	#	#
	C			\$218.64	#	#
	D			\$215.82	#	#
OC3-DS3 Channelization	A	1500		\$578.40	#	#
	B			\$363.51	#	#
	C			\$363.51	#	#
OC12-OC3 Channelization	A	500		\$225.02	#	#
	B			\$225.02	#	#
OC12-DS3 Channelization	A	4000		\$2,440.86	#	#
	B			\$1,696.71	#	#

INFORMATION REQUESTED BY
CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION
(Transcript Ref: Vol. 8 Paragraph 10742)

Q. Commissioner Menzies: And in paragraph 16 when you said your CBB rates are already lower than they were in 2012, are you comfortable giving us a ballpark of how they're lower or supplying it to us on a confidential basis?

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. An abridged version of this response is provided for the public record.

As discussed by Mr. McKeen at the oral hearing on 3 December 2014, even though the ISPs are increasing their usage on a per end-user basis, they are nevertheless paying less per end-user for CBB in 2014 than they were in 2012. This is primarily the result of Decision 2013-73 which decreased the Bell Canada and Bell Aliant Central CBB rate by more than 50% (i.e. from \$2,213.00 to \$1,036.49).

We have previously provided our total actual 2012 and 2013 CBB revenues and GAS and HSA demand in Bell Canada(CRTC)31Jul14-9 and our total estimated 2014 CBB revenues and GAS and HSA demand in Bell Canada(CRTC)31Jul14-10. When the CBB

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revenues are divided over our entire demand from those requests for information, the results are as follows:

(CRTC)31Jul14-9 and (CRTC)31Jul14-10	2011	2012	2013	2014 Forecast
Capacity Charges (CBB)	#	#	#	#
Year-End GAS and HSA Demand	#	#	#	#

Calculating CBB ARPU	2012	2013	2014
Average In-Service GAS and HSA Demand*	#	#	#
CBB Monthly ARPU**	#	#	#

* Midpoint of year-end demand and previous year-end demand.

** Capacity charges divided by average in-service demand divided by 12.

We note, however, that not all of the demand is subject to CBB charges. In fact, only GAS-Residential (both Legacy and FTTN) demand became subject to CBB on 1 February 2012 as a result of Telecom Regulatory Policy 2011-703. GAS-FTTN Business demand was only added into the mix on 8 April 2013 as a result of Decision 2013-73 and GAS-Legacy Business was added on 26 October 2013 as a result of Decision 2013-480. CBB charges are still not applied to any HSA demand. Therefore, for greater accuracy, we are also providing the CBB ARPUs that results when the CBB charges are unitized over only the demand that is subject to CBB charges.

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Average In-Service by Type (Total Units)	2012	2013	2014
GAS Residential (Legacy and FTTN)	#	#	#
GAS-FTTN Business	#	#	#
GAS-Legacy Business	#	#	#
HSA (Legacy and FTTN)	#	#	#
Total Average In-Service Demand	#	#	#

Deriving Average In-Service demand that is subject to CBB charges.

CBB effective	Average In-Service Subject to CBB	2012	2013	2014
1-Feb-12	GAS Residential (Legacy and FTTN)*	#	#	#
8-Apr-13	GAS-FTTN Business **	#	#	#
26-Oct-13	GAS-Legacy Business ***	#	#	#
no CBB	HSA (Legacy and FTTN)	#	#	#
Units Subject to CBB	Total Average In-Service	#	#	#
	CBB Monthly ARPU ****	\$	#	#

* Assumes CBB charges applied to 334 days out of 365 days in 2012.

** Assumes CBB charges applied to 268 days out of 365 days in 2013.

*** Assumes CBB charges applied to 67 days out of 365 days in 2013.

**** Capacity charges divided by average in-service demand applicable to CBB divided by 12.

In 2012, our CBB customers purchased # units (i.e. 100 MB increments) of CBB (i.e., # in 2012 CBB revenue divided by the 2012 CBB rate of \$ \$2,213.00). In 2014, it is estimated that our CBB customers will buy # units of CBB (i.e., # in 2014 CBB revenue divided by the 2014 CBB rate of \$1,036.49). Hence, while our 2014 CBB demand is # the 2012 demand (# units vs. # units), the actual annual charges # in 2014 than they were in 2012 and are in fact # lower on a per end-user basis when unitized over only the end-users that are subject to CBB charges (i.e. # in 2012 vs. # in 2014).

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INFORMATION REQUESTED BY
CANADIAN RADIO-TELEVISION AND TELECOMMUNICATIONS COMMISSION
(Transcript Ref: Vol. 8, Paragraph 10745)

Q. Commissioner Menzies: I just wanted to touch back on something. When last we met, we did discuss unbundled local loops and the forbearance issue and that sort of stuff. You indicated -- I think you said it might be possible to operationalize the differences between -- basically what we were talking about is how much would it cost to make the system changes that would be required to distinguish between residential/business/Internet services in relation to unbundled local loops and you had said it would require system changes and some implementation activities.

Can you quantify that a little bit in terms of system changes and implementation activities?

A. Certain information contained in this response is filed in confidence with the Commission pursuant to section 39 of the *Telecommunications Act* and the directions provided by the Commission in the BTIB 2010-961.¹ In particular, the information which we have provided in confidence represents disaggregated cost information and is of a type which the Commission has indicated should be treated as confidential. Release of this information on the public record would provide existing or potential competitors with invaluable competitively-sensitive information that would not otherwise be available to them, and which would enable them to develop more effective business strategies. Release of such information could prejudice our competitive position resulting in material financial loss and cause us specific direct harm. The abridged version of this response is provided for the public record.

As we indicated in our response to Undertaking #3, demand for unbundled loops is decreasing rapidly. For instance, in 2013, the number of loops we leased in Ontario and Quebec was only half that of 2009, and only 1/3 of the 2009 level in Atlantic. The

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implementation of new systems to distinguish between residential and business loops must be taken in the context of this declining demand.

The residence or business indicator is contained in our front-end system (EDE-LSR) as submitted by the customer when ordering the unbundled local loop (ULL). Historically, however, this indicator has not been stored in any database and, as such, we have no ability to distinguish the ULL in-service base between residential or business, though we can and do differentiate by band. To assist the Commission in their analysis, we conducted a study on the ULL inward orders received over the past six months and the results show that 85% of all inward ULL orders were for residence and only 15% were for business during that period.

Inward ULL Orders for June to November 2014

2014	Total	Residence		Business	
		Volume	% Total	Volume	% Total
Jun	#	#	#	#	#
Jul	#	#	#	#	#
Aug	#	#	#	#	#
Sep	#	#	#	#	#
Oct	#	#	#	#	#
Nov	#	#	#	#	#
#	#	#	85%	#	15%

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With regards to type of services being offered to the end-user, our wholesale customers do not identify what service they plan to provision on the loop. The ULL customers may be provisioning a simple voice line, but they can also duplicate an Ethernet circuit (via copper bonding), offer internet through a co-location (via competitor DSLAM) or even add TV over the loop. Once the loop is handed off at the main frame in the central office, we have no line of sight as to the actual use of that loop and the services being offered by the competitor.

Should the Commission choose to forbear from regulation on any criteria other than by band, we would be required to create new provisioning, repair and billing identifiers that can be passed to our downstream systems. Based on similar activity that we experienced to differentiate rates between Bell Aliant-Central and Bell Canada, the approximate cost to differentiate between residential and business monthly rates would be in the range of # [REDACTED] #.

Filed in confidence with the CRTC.

*** End of Document ***