



Telecom Notice of Consultation CRTC 2020-187

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Call for comments – Appropriate network configuration for disaggregated wholesale high-speed access services

Deadline for submission of interventions: 9 September 2020

[\[Submit an intervention or view related documents\]](#)

In an effort to facilitate the deployment of disaggregated wholesale high-speed access (HSA) services, the Commission is issuing this notice of consultation to address the appropriate network and service configurations for the disaggregated wholesale HSA service regime for all wholesale HSA service providers across the country, including the option of a modified level of disaggregation on the networks of Bell Canada, Cogeco, RCCI, and Videotron.

The Commission is also suspending the proceeding to set final rates, terms, and conditions for disaggregated wholesale HSA services in Ontario and Quebec until a later date.

Background

1. The Commission regulates wholesale high-speed access (HSA) services provided by large cable carriers and large telephone companies (collectively, the wholesale HSA service providers). Competitors¹ can use these services to provide their own retail Internet access and other services.
2. The Commission has initiated a number of proceedings to advance the regime for disaggregated wholesale HSA services. To date, it has considered proposed wholesale HSA service rates, terms, and conditions for certain wholesale HSA service providers in Ontario and Quebec, and launched, and subsequently suspended, the process to extend the implementation of the disaggregated wholesale HSA service regime to other wholesale HSA service providers, including those outside Ontario and Quebec.
3. In Telecom Regulatory Policy 2015-326, the Commission reviewed its wholesale services framework. It determined, among other things, that wholesale HSA services, which are used to support retail competition for services such as local telephone, television, and Internet access services, would continue to be mandated; however, the

¹ For the purposes of this notice, “competitors” refers to telecommunications services providers that operate in a given territory and that are not mandated to provide wholesale HSA services.

provision of aggregated wholesale HSA services would no longer be mandated and would be phased out in conjunction with the implementation of disaggregated wholesale HSA services.

4. The Commission determined that disaggregated wholesale HSA services would first be implemented in Ontario and Quebec, where there was significant demand. The Commission's objective at that time was also to ensure an orderly transition from the aggregated wholesale HSA service regime to the disaggregated one.
5. In Telecom Decision 2016-379, the Commission made its determinations on the proposed disaggregated wholesale HSA service configurations of Bell Canada; Cogeco Communications inc. (Cogeco); Quebecor Media Inc., on behalf of Videotron Ltd. (Videotron); and Rogers Communications Canada Inc. (RCCI) in Ontario and Quebec, with a view to providing Canadians with more choice in services such as Internet access. Increased choice was expected to drive competition, resulting in further investment in telecommunications facilities.
6. Subsequently, the Commission directed those four companies to file tariffs and supporting cost studies for their disaggregated wholesale HSA service configurations that reflected the determinations set out in Telecom Decision 2016-379.
7. In Telecom Order 2017-312, the Commission made disaggregated wholesale HSA services available and set out interim rates, terms, and conditions for these services in Ontario and Quebec.
8. By [letter](#) dated 6 July 2018, the Commission requested that other wholesale HSA service providers, namely Bell MTS Inc. (Bell MTS); Bragg Communications Incorporated, carrying on business as Eastlink (Eastlink); Saskatchewan Telecommunications (SaskTel); Shaw Cablesystems G.P. (Shaw); and TELUS Communications Inc. (TCI) submit proposed configurations, along with supporting rationale, for their disaggregated wholesale HSA services in their respective serving territories. Bell Canada and RCCI were also asked to submit proposed configurations for the services in their respective serving territories outside Ontario and Quebec (hereafter, the [follow-up proceeding](#)).
9. After the filing of proposed configurations and a subsequent request from the Canadian Network Operators Consortium Inc. (CNOc) for further process, the Commission issued a [letter](#), dated 24 October 2018, in which it noted that it was suspending the follow-up proceeding.
10. Subsequently, CNOc filed an application, dated 7 November 2018, in which it requested that the Commission review and vary Telecom Regulatory Policy 2015-326 and Telecom Decision 2016-379.

Issues and Commission's assessment

11. The Commission notes that, in separate proceedings, parties have raised issues related to the regulatory framework for wholesale HSA services and, specifically, related to the transition from aggregated to disaggregated wholesale HSA services.
12. CNOC identified some of these issues in its application. In particular, CNOC raised significant concerns with respect to the current regulatory framework for wholesale wireline services and the deployment of and transition to disaggregated wholesale HSA services. Among other things, CNOC requested a significantly reduced level of disaggregation on Bell Canada's network,² and possibly on the networks of Cogeco, RCCI, and Videotron, to address barriers to the use of disaggregated wholesale HSA services.
13. In addition, parties to the follow-up proceeding raised concerns regarding the level of disaggregation required for the service configurations. For instance, wholesale HSA service providers in Western Canada proposed that the Commission adopt lower levels of disaggregation in their networks, submitting that this approach would minimize disruption to their networks and the impact on competitors.
14. The Commission does not have confirmation that there has been any implementation of the disaggregated wholesale HSA service regime in its existing configurations.
15. In light of the above, the Commission considers that the objectives and transition plan established in Telecom Regulatory Policy 2015-326 may not be achieved without further measures. Examining the question of reducing the level of disaggregation for the services in question is timely and warranted, given that such a reduction may be required to facilitate deployment of these services across the country and to minimize any negative effects on competition that might be occurring in the markets for wholesale HSA services.
16. The Commission considers that, by establishing disaggregated wholesale HSA service configurations with the appropriate level of disaggregation for all wholesale HSA service providers in all regions across Canada, mandated access to fibre would begin for all wholesale HSA service providers, thereby making higher speeds accessible to competitors on both cable and telephone company networks.
17. In light of all the above, and in an effort to facilitate the deployment of disaggregated wholesale HSA services, the Commission is calling for comments, as set out below, to consider the appropriate level of disaggregation and configurations for a disaggregated wholesale HSA service regime for all wholesale HSA service providers across the country.

² A reduced level of disaggregation would entail interconnecting to fewer central offices or head-ends, as opposed to connecting to each central office or head-end (full disaggregation), to access disaggregated wholesale HSA services throughout the serving territory.

18. In addition, if parties and interested persons consider them relevant, up to date and responsive to the questions below, they are not prevented from refileing their submissions filed in the follow-up proceeding as part of this proceeding, with any necessary updates and responses to the questions set out below.
19. In light of this call for comments, the Commission is also suspending the proceeding to set final rates, terms, and conditions for disaggregated wholesale HSA services in Ontario and Quebec until a later date, after the close of this proceeding. The existing interim rates, terms, and conditions established in Telecom Order 2017-312 will remain in effect.
20. As noted in a Commission [letter](#) also issued today, the Commission is closing the proceeding associated with CNOC's application. With respect to the issues raised by CNOC in its application and not addressed in this notice, namely the addition of port and fibre strand sharing functionality for all incumbent carriers' disaggregated HSA services, and access to fibre-to-the-premises (FTTP) facilities over aggregated HSA services, the Commission considers that it would be appropriate to address these issues in future proceedings.

Call for comments

21. In order to ensure that the Commission has the factual record necessary to make a determination, the wholesale HSA service providers, namely Bell Aliant, a division of Bell Canada (Bell Aliant); Bell Canada; Bell MTS; Cogeco; Eastlink; RCCI; SaskTel; Shaw; TCI; and Videotron, are made parties to this proceeding and are to file responses to the questions set out below. The Commission also invites submissions from interested persons on those questions.
22. In their interventions, interested persons and the wholesale HSA service providers should provide supporting rationale and all evidence on which they relied to formulate their positions. They should structure their submissions according to the questions identified in this notice.
 - i. Provide your view, with supporting rationale and evidence, on whether or not the existing disaggregated wholesale HSA service regime supports an orderly, cost-effective transition from aggregated to disaggregated wholesale HSA services. If not, provide your view on how disaggregated wholesale HSA services should be modified to facilitate the deployment of the services.
 - ii. Specify, with supporting rationale, what factors should be taken into account in developing disaggregated wholesale HSA service configurations that include a reduced level of disaggregation (as opposed to full disaggregation) and that would allow for an efficient, cost-effective deployment of the disaggregated wholesale HSA service regime across the country. If you are of the view that the current level of disaggregation is appropriate, explain why, taking into account the factors you have specified.

In response to questions iii to vi below, the Commission invites interested persons and the wholesale HSA service providers to consider a variety of factors, including the following:

- achieving minimal disruption to the wholesale HSA service provider's existing network and the planned evolution of the network;
- reducing changes to the wholesale HSA service provider's network, taking into account existing and planned network architecture;
- establishing a minimum addressable market at a competitor point of interconnection, taking into account geographical considerations (e.g. the distinction between rural and urban areas, where applicable);
- minimizing barriers to entry for competitors, such as costs for transport or for point of interconnection implementation; and
- minimizing the deployment timeline and costs.

In addition, interested persons and the wholesale HSA service providers are to comment on how their positions and proposals are consistent with the objectives of the *Telecommunications Act* (the Act) as well as with the 2006 Policy Direction³ and the 2019 Policy Direction⁴ (collectively, the Policy Directions).

- iii. Propose a configuration (or configurations) for disaggregated wholesale HSA services that includes a reduced level of disaggregation (as opposed to full disaggregation), that takes into account the factors set out above, and that is consistent with the Act and with the Policy Directions. The wholesale HSA service providers are to provide their respective configurations.
- iv. Explain, with supporting rationale, how the proposed configuration(s) will allow for an efficient, cost-effective deployment of the disaggregated wholesale HSA service regime.
- v. For the proposed configuration(s), provide the network access diagram reflecting the factors in response to question ii above.
- vi. Indicate whether there are any other issues with respect to the proposed configuration(s). If so, specify these issues.

Procedure

23. The *Canadian Radio-television and Telecommunications Commission Rules of Practice and Procedure* (the Rules of Procedure) apply to this proceeding. The Rules

³ *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives*, SOR/2006-355, 14 December 2006

⁴ *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives to Promote Competition, Affordability, Consumer Interests and Innovation*, SOR/2019-227, 17 June 2019

of Procedure set out, among other things, the rules for the content, format, filing, and service of interventions, answers, replies, and requests for information; the procedure for filing confidential information and requesting its disclosure; and the conduct of public hearings. Accordingly, the procedure set out below must be read in conjunction with the Rules of Procedure and related documents, which can be found on the Commission's website at www.crtc.gc.ca, under "[Statutes and regulations](#)." The guidelines set out in Broadcasting and Telecom Information Bulletin 2010-959 provide information to help interested persons and parties understand the Rules of Procedure so that they can more effectively participate in Commission proceedings.

24. The wholesale HSA providers listed in paragraph 21 above are made parties to this proceeding.
25. The wholesale HSA service providers are to submit their responses to requests for information set out in the Appendix to this notice by **13 July 2020**.
26. The wholesale HSA service providers must file interventions with the Commission regarding the above-noted issues by **9 September 2020**.
27. Interested persons who wish to become parties to this proceeding must file interventions with the Commission regarding the above-noted issues by **9 September 2020**. The interventions must be filed in accordance with section 26 of the Rules of Procedure.
28. Parties are permitted to coordinate, organize, and file, in a single submission, interventions by other interested persons who share their position. Information on how to file this type of submission, known as a joint supporting intervention, as well as a [template](#) for the accompanying cover letter to be filed by parties, can be found in Telecom Information Bulletin 2011-693.
29. All documents required to be served on parties to the proceeding must be served using the contact information contained in the interventions.
30. All parties may file replies to interventions with the Commission by **9 November 2020**.
31. The Commission encourages interested persons and parties to monitor the record of this proceeding, available on the Commission's website at www.crtc.gc.ca, for additional information that they may find useful when preparing their submissions.
32. Submissions longer than five pages should include a summary. Each paragraph of all submissions should be numbered, and the line *****End of document***** should follow the last paragraph. This will help the Commission verify that the document has not been damaged during electronic transmission.
33. Pursuant to Broadcasting and Telecom Information Bulletin 2015-242, the Commission expects incorporated entities and associations, and encourages all Canadians, to file submissions for Commission proceedings in accessible formats

(for example, text-based file formats that enable text to be enlarged or modified, or read by screen readers). To provide assistance in this regard, the Commission has posted on its website [guidelines](#) for preparing documents in accessible formats.

34. Submissions must be filed by sending them to the Secretary General of the Commission using **only one** of the following means:

by completing the
[\[Intervention form\]](#)

or

by mail to
CRTC, Ottawa, Ontario K1A 0N2

or

by fax to
819-994-0218

35. Parties who send documents electronically must ensure that they will be able to prove, upon Commission request, that filing, or where required, service of a particular document was completed. Accordingly, parties must keep proof of the sending and receipt of each document for 180 days after the date on which the document is filed or served. The Commission advises parties who file or serve documents by electronic means to exercise caution when using email for the service of documents, as it may be difficult to establish that service has occurred.
36. In accordance with the Rules of Procedure, a document must be received by the Commission and all relevant parties by 5 p.m. Vancouver time (8 p.m. Ottawa time) on the date it is due. Parties are responsible for ensuring the timely delivery of their submissions and will not be notified if their submissions are received after the deadline. Late submissions, including those due to postal delays, will not be considered by the Commission and will not be made part of the public record.
37. The Commission will not formally acknowledge submissions. It will, however, fully consider all submissions, which will form part of the public record of the proceeding, provided that the procedure for filing set out above has been followed.

Important notice

38. All information that parties provide as part of this public process, except information designated confidential, whether sent by postal mail, fax, email, or through the Commission's website at www.crtc.gc.ca, becomes part of a publicly accessible file and will be posted on the Commission's website. This includes all personal information, such as full names, email addresses, postal/street addresses, and telephone and fax numbers.

39. The personal information that parties provide will be used and may be disclosed for the purpose for which the information was obtained or compiled by the Commission, or for a use consistent with that purpose.
40. Documents received electronically or otherwise will be posted on the Commission's website in their entirety exactly as received, including any personal information contained therein, in the official language and format in which they are received. Documents not received electronically will be available in PDF format.
41. The information that parties provide to the Commission as part of this public process is entered into an unsearchable database dedicated to this specific public process. This database is accessible only from the web page of this particular public process. As a result, a general search of the Commission's website with the help of either its search engine or a third-party search engine will not provide access to the information that was provided as part of this public process.

Availability of documents

42. Electronic versions of the interventions and other documents referred to in this notice are available on the Commission's website at www.crtc.gc.ca by using the public record number provided at the beginning of this notice or by visiting the "Consultations and hearings – Have your say!" section, then selecting "our applications and processes that are open for comment." Documents can then be accessed by clicking on the links in the "Subject" and "Related Documents" columns associated with this particular notice.
43. Documents are also available at the following address, upon request, during normal business hours.

Les Terrasses de la Chaudière
Central Building
1 Promenade du Portage
Gatineau, Quebec
J8X 4B1
Tel.: 819-997-2429
Fax: 819-994-0218

Toll-free telephone: 1-877-249-2782
Toll-free TTY: 1-877-909-2782

Secretary General

Related documents

- *Interim rates for disaggregated wholesale high-speed access services in Ontario and Quebec*, Telecom Order CRTC 2017-312, 29 August 2017; as amended by Telecom Order CRTC 2017-312-1, 12 September 2017

- *Follow-up to Telecom Regulatory Policy 2015-326 – Implementation of a disaggregated wholesale high-speed access service, including over fibre-to-the-premises access facilities*, Telecom Decision CRTC 2016-379, 20 September 2016
- *Review of wholesale wireline services and associated policies*, Telecom Regulatory Policy CRTC 2015-326, 22 July 2015; as amended by Telecom Regulatory Policy CRTC 2015-326-1, 9 October 2015
- *Filing submissions for Commission proceedings in accessible formats*, Broadcasting and Telecom Information Bulletin CRTC 2015-242, 8 June 2015
- *Filing of joint supporting interventions*, Telecom Information Bulletin CRTC 2011-693, 8 November 2011
- *Guidelines on the CRTC Rules of Practice and Procedure*, Broadcasting and Telecom Information Bulletin CRTC 2010-959, 23 December 2010

Appendix to Telecom Notice of Consultation CRTC 2020-187

Requests for information

Bell Aliant, Bell MTS, and SaskTel

1. For April 2020 (or for the most recent month of available data), provide the following information for your networks in the regions in which you are an incumbent, by province:
 - a) the total number of central offices;
 - b) the total number of central offices capable of providing high-speed Internet access services using legacy digital subscriber line (DSL), fibre-to-the-node (FTTN), and/or FTTP technology;
 - c) the total number of aggregated wholesale HSA service end-customers; and
 - d) a breakdown of the total number of aggregated wholesale HSA service end-customers by competitor (i.e. provide the name of each competitor making use of the service and the associated number of aggregated wholesale HSA service end-customers).

2. For April 2020 (or for the most recent month of available data) provide, in the Excel spreadsheet (Attachment 1), the following information for each central office capable of providing high-speed Internet access services using legacy DSL, FTTN, and/or FTTP technology:
 - a) the name of each central office;
 - b) the Common Language Location Identifier (CLLI) of each central office;
 - c) the civic address of each central office;
 - d) the longitude and latitude of each central office;
 - e) the name of the associated exchange;
 - f) indicate whether there is existing equipment at each central office that supports a competitor interface allowing a competitor to connect to aggregated wholesale HSA service. If the answer is “No,” specify the name and CLLI of the central office with router equipment that this central office is connected to in order to access end-customers of the aggregated wholesale HSA service at this office. Specify the maximum available competitor interface speed;
 - g) the number of local wireline network access services (NAS) served by each central office;
 - h) the total number of premises passed that are capable of receiving HSA services for each central office, along with a breakdown by legacy DSL, FTTN, and FTTP technologies;

- i) the number of end-customers subscribing to the company's retail residential high-speed Internet access service at each central office, broken down by legacy DSL, FTTN, and FTTP technologies;
 - j) the number of end-customers subscribing to the company's retail business high-speed Internet access service at each central office, broken down by legacy DSL, FTTN, and FTTP technologies;
 - k) the total number of aggregated wholesale HSA service end-customers served at each central office; and
 - l) the five competitors with the largest number of aggregated wholesale HSA service end-customers. For each of the identified competitors, specify the number of aggregated wholesale HSA service end-customers it serves at that central office.
3. For the historical year 2019 and forecast years 2020 and 2021, provide the following information, by province:
- a) the total number of retail high-speed Internet service end-customers served by the company over fixed wireline networks, and the associated revenue;
 - b) a breakdown of the retail high-speed Internet service connections over fixed-wireline networks by speed, and the associated revenue;
 - c) the number of premises passed by HSA facilities that are capable of receiving HSA services (such as retail Internet service or wholesale HSA service). Provide the total number of premises passed and a breakdown by access technology deployed (i.e. for copper-based HSA access facilities, provide the number of premises passed by FTTN facilities, by legacy DSL facilities, and by both FTTN and legacy DSL facilities; for FTTP facilities, provide the total number of premises passed and the number of premises passed by FTTP facilities only);
 - d) the total number of wholesale HSA service end-customers that the company serves, along with a breakdown of the number of end-customer wholesale HSA service connections by speed, and the associated revenue for each speed; and
 - e) if applicable to the company, the total number of wholesale HSA service capacity-based billing (CBB) increments and the associated revenue.

Bell Canada

1. For April 2020 (or for the most recent month of available data) provide the following information for your networks in the regions in which you are an incumbent, by province:
 - a) the total number of central offices;
 - b) the total number of central offices capable of providing high-speed Internet access services using legacy DSL, FTTN, and/or FTTP technology;

- c) the total number of aggregated wholesale HSA service end-customers; and
 - d) a breakdown of the total number of aggregated wholesale HSA service end-customers by competitor (i.e. provide the name of each competitor making use of the service and the associated number of aggregated wholesale HSA service end-customers).
2. For April 2020 (or for the most recent month of available data) provide, in the Excel spreadsheet (Attachment 2), the following information for each central office capable of providing high-speed Internet access services using legacy DSL, FTTN, and/or FTTP technology:
- a) the name of each central office;
 - b) the CLLI of each central office;
 - c) the civic address of each central office;
 - d) the longitude and latitude of each central office;
 - e) the name of the associated exchange;
 - f) Bell Canada stated in its response to requests for information in the disaggregated wholesale HSA service proceeding that if a competitor wants a 10 GigE interface (or 100 GigE at some central offices), the competitor has to connect at central offices with distribution routers (DRs). Otherwise, it can connect to Ethernet switches that are connected to DRs.⁵ For each central office, indicate whether it is equipped with a DR or DRs. If there is no local DR and a competitor wishes to connect at a local Ethernet switch, provide the CLLI of the central office with a DR that the local Ethernet switch would be connected to in order to provide the service. Specify the maximum GigE interface speed that is supported;
 - g) the number of local wireline NAS served by each central office;
 - h) the total number of premises passed that are capable of receiving HSA services at each central office, along with a breakdown by legacy DSL, FTTN, and FTTP technologies;
 - i) the number of end-customers subscribing to the company's retail residential high-speed Internet access service at each central office, broken down by legacy DSL, FTTN, and FTTP technologies;
 - j) the number of end-customers subscribing to the company's retail business high-speed Internet access service at each central office, broken down by legacy DSL, FTTN, and FTTP technologies;
 - k) the total number of aggregated wholesale HSA service end-customers served at each central office;

⁵ Refer to response to request for information entitled Bell Canada (CRTC)2Mar18-19 Decision 2016-379.

- l) where applicable, the total number of disaggregated wholesale HSA service end-customers served at each central office; and
 - m) the five competitors with the largest number of aggregated wholesale HSA service end-customers. For each of the identified competitors, specify the number of aggregated wholesale HSA service end-customers it serves at that central office.
3. For the historical year 2019 and forecast years 2020 and 2021, provide the following information, by province:
- a) the total number of retail high-speed Internet service end-customers served by the company over fixed wireline networks, and the associated revenue;
 - b) a breakdown of the retail high-speed Internet service connections over fixed wireline networks by speed, and the associated revenue;
 - c) the number of premises passed for providing HSA services (retail Internet service or wholesale HSA service). Provide the total number of premises passed and a breakdown by access technology deployed (i.e. for copper-based HSA access facilities, provide the number of premises passed by FTTN facilities, by legacy DSL facilities, and by both FTTN and legacy DSL facilities; for FTTP facilities, provide the total number of premises passed and the number of premises passed by FTTP facilities only);
 - d) the total number of wholesale HSA service end-customers that the company serves, and a breakdown of the end-customer wholesale service connections by speed, along with the associated revenue; and
 - e) the total number of wholesale HSA service CBB increments and the associated revenue.

TCI

1. For April 2020 (or for the most recent month of available data) provide the following information for your networks in the regions in which you are an incumbent, by province:
- a) the total number of central offices;
 - b) the total number of central offices capable of providing high-speed Internet access services using legacy DSL, FTTN, and/or FTTP technology;
 - c) the total number of aggregated wholesale HSA service end-customers; and
 - d) a breakdown of the total number of aggregated wholesale HSA service end-customers by competitor (i.e. provide the name of each competitor making use of the service and the associated number of aggregated wholesale HSA service end-customers).
2. For April 2020 (or for the most recent month of available data) provide, in the Excel spreadsheet (Attachment 3), the following information for each central office capable of providing high-speed Internet access services using legacy DSL, FTTN, and/or FTTP technology:

- a) the name of each central office;
 - b) the CLLI of each central office;
 - c) the civic address of each central office;
 - d) the longitude and latitude of each central office;
 - e) the name of the associated exchange;
 - f) indicate whether there is a routed edge (RE) at the central office. If there is no RE, identify which central office with an RE its access devices supporting HSA are homed to. Specify the maximum Network-to-Network Interface Service (NNI) speed in gigabits per second (Gbps).
 - g) the number of local wireline NAS served by each central office;
 - h) the total number of premises passed that are capable of receiving HSA services at each central office, along with a breakdown by legacy DSL, FTTN, and FTTP technologies;
 - i) the number of end-customers subscribing to the company's retail residential high-speed Internet access service at each central office, broken down by legacy DSL, FTTN, and FTTP technologies;
 - j) the number of end-customers subscribing to the company's retail business high-speed Internet access service at each central office, broken down by legacy DSL, FTTN, and FTTP technologies;
 - k) the total number of aggregated wholesale HSA service end-customers served by each central office; and
 - l) the five competitors with the largest number of aggregated wholesale HSA service end-customers. For each of the identified competitors, specify the number of aggregated wholesale HSA service end-customers it serves at that central office.
3. For the historical year 2019 and forecast years 2020 and 2021, provide the following information, by province:
- a) the total number of retail high-speed Internet service end-customers that the company serves over fixed wireline networks, and the associated revenue;
 - b) a breakdown of the retail high-speed Internet service connections over fixed wireline networks by speed, and the associated revenue;
 - c) the number of premises passed for providing high-speed access services (retail Internet service or wholesale HSA service). Provide the total number of premises passed and a breakdown by access technology deployed (i.e. for copper-based HSA access facilities, provide the number of premises passed by FTTN facilities, by legacy DSL facilities, and by both FTTN and legacy DSL facilities; for FTTP facilities, provide the total number of premises passed and the number of premises passed by FTTP facilities only); and

- d) the total number of wholesale HSA service end-customers that the company serves, and a breakdown of the end-customer wholesale service connections by speed, along with the associated revenue.

Cogeco, Eastlink, and RCCI

1. For April 2020 (or for the most recent month of available data), provide the following information for your networks in the regions in which you are an incumbent, by province:
 - a) the total number of sites with cable modem terminating systems (CMTS) and/or converged cable access platforms (CCAP);
 - b) the total number of sites capable of providing high-speed Internet access services;
 - c) the total number of aggregated wholesale HSA service end-customers; and
 - d) a breakdown of the total number of aggregated wholesale HSA service end-customers by competitor (i.e. provide the name of each competitor making use of the service and the associated number of aggregated wholesale HSA service end-customers).
2. For April 2020 (or for the most recent month of available data) provide, in the Excel spreadsheet (Attachment 4), the following information for your respective company sites that contain CMTS and/or CCAP equipment:
 - a) the name of each site;
 - b) the civic address of each site;
 - c) the longitude and latitude of each site;
 - d) the number of CMTS at each site;
 - e) the number of CCAP at each site;
 - f) identify the site or sites with routing equipment to which the CMTS and/or CCAP at this site is/are connected;
 - g) the total number of premises passed that are capable of receiving HSA services at each site, along with a breakdown by access technology deployed (i.e. premises passed by hybrid fibre-coaxial [HFC] facilities, by FTTP facilities, and by both HFC and FTTP facilities);
 - h) the number of cable television subscribers served by each site;
 - i) the number of end-customers subscribing to the company's retail residential high-speed Internet access services at each site, broken down by HFC facilities and FTTP facilities;
 - j) the number of end-customers subscribing to the company's retail business high-speed Internet access services at each site, broken down by HFC facilities and FTTP facilities;

- k) the total number of aggregated wholesale HSA service end-customers served by each site;
 - l) where applicable, the total number of disaggregated wholesale HSA service end-customers served by each site; and
 - m) the five competitors with the largest number of aggregated wholesale HSA service end-customers. For each of the identified competitors, specify the number of aggregated wholesale HSA service end-customers it serves at that site.
3. For the historical year 2019 and forecast years 2020 and 2021, provide the following information, by province:
- a) the total number of retail high-speed Internet service end-customers served by the company over fixed wireline networks, and the associated revenue;
 - b) a breakdown of the retail high-speed Internet service connections over fixed wireline networks by speed, and the associated revenue;
 - c) the number of premises passed for providing HSA services (retail Internet service or wholesale HSA service). Provide the total premises passed and a breakdown by access technology deployed (i.e. for HFC facilities, FTTP facilities, and both HFC and FTTP facilities);
 - d) the total number of aggregated wholesale HSA service end-customers that the company serves, and a breakdown of the end-customer wholesale service connections by speed, along the associated revenue; and
 - e) the total number of wholesale HSA service CBB increments and the associated revenue.

Shaw

1. For April 2020 (or for the most recent month of available data), provide the following information for your networks in the regions in which you are an incumbent, by province:
- a) the total number of sites with CMTS and/or CCAP;
 - b) the total number of sites capable of providing high-speed Internet access services;
 - c) the total number of aggregated wholesale HSA service end-customers; and
 - d) a breakdown of the total number of aggregated wholesale HSA service end-customers by competitor (i.e. provide the name of each competitor making use of the service and the associated number of aggregated wholesale HSA service end-customers).
2. For April 2020 (or for the most recent month of available data) provide, in the Excel spreadsheet (Attachment 5), the information requested below for your respective company sites that contain CMTS and/or CCAP:
- a) the name of each site;

- b) the civic address of each site;
 - c) the longitude and latitude of each site;
 - d) the number of CMTS at each site;
 - e) the number of CCAP at each site;
 - f) Shaw has described its sites as either hub sites or core sites.⁶ For each site, indicate whether it is a hub site or a core site. If the site is a hub site, indicate the core site(s) at which its CMTS and/or CCAP is/are connected to routing equipment;
 - g) the total number of premises passed that are capable of receiving HSA services at each site, along with a breakdown by access technology deployed (i.e., premises passed by HFC facilities, by FTTP facilities, and by both HFC and FTTP facilities);
 - h) the number of television subscribers served by each site;
 - i) the number of end-customers, for each site, subscribing to the company's retail residential high-speed Internet access services, broken down by HFC facilities and FTTP facilities;
 - j) the number of end-customers, for each site, subscribing to the company's retail business high-speed Internet access services, broken down by HFC facilities and FTTP facilities;
 - k) the total number of aggregated wholesale HSA service end-customers served by each site; and
 - l) the five competitors with the largest number of aggregated wholesale HSA service end-customers. For each of the identified competitors, specify the number of aggregated wholesale HSA service end-customers it serves at that site.
3. For the historical year 2019 and forecast years 2020 and 2021, provide the following information, by province:
- a) the total number of retail high-speed Internet service end-customers served by the company over fixed wireline networks, and the associated revenue;
 - b) a breakdown of the retail high-speed Internet service connections over fixed wireline networks by speed, and the associated revenue;
 - c) the number of premises passed for providing HSA services (retail Internet service or wholesale HSA service). Provide the total number of premises passed and a breakdown by access technology deployed (i.e. for HFC facilities, FTTP facilities, and both HFC and FTTP facilities);

⁶ See disaggregated third-party Internet access technical proposal entitled *Re: Follow-up process to consider implementation issues of disaggregated wholesale HSA services, including over FTTP access facilities, in other regions – Shaw Disaggregated TPIA Architecture*, 25 September 2018.

- d) the total number of aggregated wholesale HSA service end-customers that the company serves, and a breakdown of the end-customer wholesale service connections by speed, along with the associated revenue; and
- e) the total number of wholesale HSA service CBB increments and the associated revenue.

Videotron

1. For April 2020 (or for the most recent month of available data), provide the following information for your networks in the regions in which you are an incumbent, by province:
 - a) the total number of sites with CMTS and/or CCAP;
 - b) the total number of sites capable of providing high-speed Internet access services;
 - c) the total number of aggregated wholesale HSA service end-customers; and
 - d) a breakdown of the total number of aggregated wholesale HSA service end-customers by competitor (i.e. provide the name of each competitor making use of the service and the associated number of aggregated wholesale HSA service end-customers).
2. For April 2020 (or for the most recent month of available data) provide, in the Excel spreadsheet (Attachment 6), the following information for your company sites that contain CMTS and/or CCAP:
 - a) the name of each site;
 - b) the civic address of each site;
 - c) the longitude and latitude of each site;
 - d) the number of CMTS at each site;
 - e) the number of CCAP at each site;
 - f) Videotron has submitted that CMTS and CCAP in all its sites are interconnected to two backbone routers.⁷ Identify the backbone router sites to which the CMTS and/or CCAP at each site is/are connected;
 - g) the total number of premises passed that are capable of receiving HSA services at each site, along with a breakdown by access technology deployed (i.e. premises passed by HFC facilities, by FTTP facilities, and by both HFC and FTTP facilities);
 - h) the number of cable television subscribers served by each site;

⁷ See Videotron's proposed configuration submission entitled *Instance de suivi visant à examiner les questions de mise en œuvre des services d'accès haute vitesse de gros dégroupés, y compris par l'intermédiaire d'installations de fibre jusqu'au locaux de l'abonné*, 25 September 2015 [in French only].

- i) for each site, the number of end-customers subscribing to the company's retail residential high-speed Internet access services;
 - j) for each site, the number of end-customers subscribing to the company's retail business high-speed Internet access services;
 - k) the total number of aggregated wholesale HSA service end-customers served by each site;
 - l) where applicable, the total number of disaggregated wholesale HSA service end-customers served by each site; and
 - m) the five competitors with the largest number of aggregated wholesale HSA service end-customers. For each of the identified competitors, specify the number of aggregated wholesale HSA service end-customers it serves at that site.
3. For the historical year 2019 and forecast years 2020 and 2021, provide the following information, by province:
- a) the total number of retail high-speed Internet service end-customers that the company serves over fixed wireline networks, and the associated revenue;
 - b) a breakdown of the retail high-speed Internet service connections over fixed wireline networks by speed, and the associated revenue;
 - c) the number of premises passed for providing HSA services (retail Internet service or wholesale HSA service). Provide the total number of premises passed and a breakdown by access technology deployed (i.e. for HFC facilities, FTTP facilities, and both HFC and FTTP facilities);
 - d) the total number of aggregated wholesale HSA service end-customers that the company serves, and a breakdown of the end-user wholesale service connections by speed, along with the associated revenue; and
 - e) the total number of wholesale HSA service CBB increments and the associated revenue.