



Telecom Order CRTC 2023-171

PDF version

Ottawa, 7 June 2023

Public records: Bell Mobility Tariff Notices 5A and 5B; RCCI Tariff Notices 72A and 72B; and TCI Tariff Notice 564A

Amendments to wholesale roaming service tariffs to reflect Commission determinations regarding seamless roaming and 5G networks

Summary

The Commission **approves, with changes**, the national wireless carriers' wholesale roaming tariffs that take into account seamless roaming and 5G [fifth-generation] networks.

The Commission **directs** the national wireless carriers to issue final tariff pages reflecting the changes indicated in this order and appendices 1 and 2 by **19 June 2023**.

The Commission further **directs** Rogers Communications Canada Inc. to file, for approval, proposed tariff pages regarding the terms and conditions for the offering of direct interconnection by **27 June 2023**.

The Commission also reminds Bell Mobility Inc. and TELUS Communications Inc. (TCI) that they must file, for approval, proposed tariff pages for the offering of direct interconnection when they notify regional wireless carriers of the launch of a 5G standalone core network.

All consumers that benefit from wholesale roaming should be able to enjoy the benefits of seamless roaming. Accordingly, the Commission **directs** TCI to remove from items 233.1 and 233.2 of its proposed tariff the limitations on offering seamless roaming functionality (i) to large businesses, institutions, resellers, and mobile virtual network operator customers, and (ii) in connection with Internet of Things and machine-to-machine communications.

The Commission determines that it is unable to evaluate at this time whether seamless roaming implementation should be addressed in separate charges or be recovered as part of wholesale roaming rates, and whether the proposed rates are just and reasonable. The Commission considers that it is not appropriate to address those proposed rates in this decision. Accordingly, following this order, wholesale customers will have access to seamless roaming at no incremental cost.

Background

1. In Telecom Regulatory Policy 2021-130, the Commission completed a review of mobile wireless services. Among other things, the Commission confirmed that its policy for wholesale mobile wireless roaming applies to 5G [fifth-generation] networks and directed Bell Mobility Inc. (Bell Mobility), Rogers Communications Canada Inc. (RCCI), and TELUS Communications Inc. (TCI) [collectively, the national wireless carriers (also referred to as wholesale roaming providers)] to enable seamless roaming between their networks and those of the regional wireless carriers (also referred to as wholesale roaming customers).¹
2. The Commission directed the national wireless carriers to file amended tariffs for wholesale mobile wireless roaming service (wholesale roaming) reflecting the Commission's determinations in Telecom Regulatory Policy 2021-130, and to begin offering seamless roaming by 15 April 2022. The Commission also acknowledged the potential of additional operational costs associated with implementing seamless roaming and noted that the existing wholesale roaming tariffs were subject to a five-year cost study when they were finalized in Telecom Orders 2017-433 and 2018-99. Accordingly, the Commission determined that an assessment of the underlying costs associated with the implementation of seamless roaming and the proper reflection of these costs in the tariffed rates may be appropriate upon implementation.
3. In Telecom Decision 2022-102, the Commission issued a number of determinations related to the implementation of seamless roaming to ensure that this functionality is available to regional wireless carriers and their end-users in a timely fashion. The Commission also made determinations to facilitate roaming on 5G standalone (5G-SA) networks as they are deployed, to ensure that regional wireless carriers are not disadvantaged relative to the national wireless carriers. The Commission therefore directed the national wireless carriers to make further changes to the proposed terms and conditions in their wholesale roaming tariffs to enable seamless hand-off.² The Commission also noted that RCCI and TCI had proposed to include tariff provisions relating to rates for the seamless roaming service without specifying the rates. The Commission reminded the national wireless carriers that any changes to their tariffed wholesale roaming rates require prior Commission approval.

¹ Seamless roaming involves the hand-off of calls and data sessions between the networks of wireless carriers without any interruption in service. In the absence of such a capability, when a regional wireless carrier's subscriber moves outside that carrier's network footprint to an area served by a wholesale roaming provider, the subscriber's call and data sessions are dropped.

² The Commission determined in Telecom Decision 2022-102 that seamless roaming is to be provided using one-way seamless hand-off. With one-way seamless hand-off, an end-user on a call or data session who crosses from a regional wireless carrier's network to a national wireless carrier's network would have that call or data session handed off without interruption. Going the other way, from a national wireless carrier's network to a regional wireless carrier's network, the end-user would simply remain on the national wireless carrier's network until the call or data session was completed, with no hand-off occurring.

4. The Commission received applications from the national wireless carriers, dated 21 April 2022, in which they proposed amendments to their wholesale roaming tariffs to reflect the Commission's determinations set out in Telecom Decision 2022-102.
5. The Commission received interventions regarding the national wireless carriers' applications from Bragg Communications Incorporated, carrying on business as Eastlink (Eastlink); Cogeco Communications inc., on behalf of Cogeco Connexion Inc. (Cogeco); Iristel Inc., on its own behalf and on behalf of its affiliates Ice Wireless Inc. and i-MobileCA (Iristel); Quebecor Media Inc., on behalf of Videotron Ltd. (Videotron); and Xplornet Communications Inc. and Xplore Mobile Inc. (Xplore)³ [collectively, the interveners].
6. On 6 July 2022, Bell Mobility filed an application to review and vary Telecom Decision 2022-102. Among other things, Bell Mobility requested that the Commission (i) rescind the direction to make seamless hand-off available for in-footprint coverage gaps,⁴ and (ii) seek additional evidence regarding appropriate and feasible timelines for seamless hand-off boundary change requests.
7. In a [letter](#) dated 21 July 2022, the Commission denied Bell Mobility's review and vary application. The Commission determined that Bell Mobility had not presented any compelling arguments or evidence to support its application. Also, the Commission noted that it must at times exercise its discretion to ensure that the regulatory measures it mandates are not delayed unnecessarily, and that Bell Mobility and the other national wireless carriers have had nearly 15 months since Telecom Regulatory Policy 2021-130 was issued to prepare for the implementation of seamless roaming.

Issues

8. The Commission notes that tariffs are critical tools to put into place the Commission's determinations and to provide regulatory certainty. That said, not every element, scenario, technology, or arrangement that impacts the terms and conditions of a telecommunications service can necessarily be accounted for in the tariffs in advance. In order to implement the Commission's determinations in Telecom Regulatory Policy 2021-130 and Telecom Decision 2022-102, the Commission has identified the following issues to be addressed in this order:

³ On 13 September 2022, Xplornet Communications Inc. changed its name to Xplore Inc. Xplore Mobile Inc. ceased operations on 31 August 2022.

⁴ In-footprint roaming occurs when a wireless carrier's retail customers roam on another carrier's network while they are within their home carrier's network footprint. In some cases, there are coverage gaps in these network footprints.

- Did the national wireless carriers' proposed amendments to their tariffs appropriately address the determinations made in Telecom Decision 2022-102?
- Are the new matters raised by the national wireless carriers appropriate for inclusion in their tariffs?

Did the national wireless carriers' proposed amendments to their tariffs appropriately address the determinations made in Telecom Decision 2022-102?

9. In the Commission's view, the national wireless carriers have proposed appropriate modifications to their tariffs to fully address several of the concerns raised in Telecom Decision 2022-102, such as the provision of seamless roaming using one-way seamless hand-off and the immediate acceptance of written requests from regional wireless carriers. However, the following proposed amendments were of concern to interveners:

- Discretion to deny the provision of seamless roaming and the clarity and efficiency of the implementation process
- Availability of seamless roaming to regional wireless carriers where they have in-footprint coverage gaps
- Timelines for the implementation of operational seamless roaming upon request
- Updates to cell site information, boundary changes, and the corresponding adjustments to the national wireless carriers' networks
- Availability of direct interconnection
- Requirements regarding the availability of seamless roaming on 5G networks

Discretion to deny the provision of seamless roaming and the clarity and efficiency of the implementation process

Background

10. In Telecom Decision 2022-102, the Commission directed the national wireless carriers to remove any wording from their proposed tariffs that gives them the discretion to deny the provision of seamless roaming based on unilateral feasibility assessments. This direction arose because Bell Mobility had proposed provisions that introduced an implementation process for seamless roaming, but effectively gave itself the discretion to deny offering seamless roaming to regional wireless carriers as part of that process. The Commission determined that unilateral feasibility assessments were inappropriate and contrary to the determinations concerning seamless roaming made in Telecom Regulatory Policy 2021-130. It also determined that the tariffs must set out the process and steps to operationalize seamless roaming upon a regional wireless carrier's request. The Commission therefore directed RCCI and TCI to revise their tariff pages to set out the process and steps like Bell Mobility did.

Positions of parties

11. Eastlink and Xplore submitted that language remains in the national wireless carriers' proposed tariffs that would allow them to deny service due to technical issues or limitations. They provided as an example Bell Mobility's proposed item 100.18, which includes the following language:

No further Services for Seamless Handoff are required to be provided by the Company to the Wholesale Roaming Customer pursuant to this tariff item if the Company has determined it is not feasible to implement Seamless Handoff.

12. In Xplore's view, given that Bell Mobility has no obligation to provide seamless roaming where there are feasibility barriers, Bell Mobility may be encouraged to identify as many barriers as possible to discourage or delay the regional wireless carrier from accessing seamless roaming. Eastlink added that Bell Mobility did not provide any detail on the information required to perform the review, nor did it provide any information on the criteria that it proposed to use to determine the feasibility of providing seamless roaming. This lack of information would inevitably lead to unnecessary delays and disputes.
13. With respect to RCCI's proposed tariff, Eastlink submitted that RCCI did not specify what information it would require to complete its seamless roaming implementation review, nor did it outline the criteria it would use to determine the feasibility of providing seamless roaming; therefore, RCCI would have full discretion to reject an application and otherwise delay the process. Eastlink was also of the view that RCCI's review adds an additional step to the implementation process, inevitably leading to unnecessary delays and disputes.
14. Videotron shared Eastlink's concern and submitted that the following statement in item 800.4.5.1.b should be deleted: "If Rogers determines that Seamless Roaming is not feasible with the current technology of the Wholesale Roaming Customer, Rogers will assist Wholesale Roaming Customer to identify what solutions may be possible." It submitted that the statement should be replaced with a statement that fully reflects the Commission's direction from paragraph 32 of Telecom Decision 2022-102.
15. Videotron noted the use of "in all the circumstances" regarding the availability of seamless hand-off services in Bell Mobility's and RCCI's proposed tariffs.⁵ Videotron questioned whether Bell Mobility and RCCI were trying to grant themselves the power to reject requests for seamless hand-off in all operating territories whenever a problem of technical feasibility is found in one operating territory, or to reject requests for seamless hand-off for all technologies whenever a problem of technical feasibility is found for one technology.

⁵ Both companies' proposed tariffs indicate that seamless hand-off services "are available only where technically feasible in all the circumstances."

16. Eastlink and Videotron submitted that TCI included provisions that could be used to deny the implementation of seamless roaming due to technical incompatibilities or issues, such as item 233.3.2.a.ii, which allows TCI to deny any service if the standards and industry guidelines have not been widely adopted in Canada. Eastlink and Videotron indicated that, as stated by the Commission in Telecom Decision 2022-102, the national wireless carriers and regional wireless carriers are expected to work together in good faith to overcome technical impediments. Eastlink also indicated that TCI failed to mention the dispute resolution process.
17. Videotron submitted that the word “may” needs to be replaced by “shall” in TCI’s item 233.1, where the company states that it “may make available Seamless Roaming Service as an add-on capability of the GSM [Global System for Mobile communications]-based Roaming Service (...).”
18. Videotron noted that, in item 233.3.8.a.ii.C, TCI specified that a regional wireless carrier must include in its initial implementation request “the proposed Company [i.e., TCI] cell sites where the Wholesale Roaming Customer requests a seamless handoff.” Videotron submitted that the requirement is illogical because at this stage of the implementation process, TCI has not yet provided any cell site information to the regional wireless carrier. Videotron recommended that TCI’s initial implementation process be amended so that TCI is obligated to provide comprehensive cell site information for any geographic areas identified by a regional wireless carrier as candidates for seamless hand-off.
19. Cogeco submitted that Bell Mobility modified the language in items 100.18(a)(1)a to c of its proposed tariff to include a more collaborative process in receiving, assessing, and determining the viability of requests for seamless roaming from regional wireless carriers. It also noted that Bell Mobility provides the option for the regional wireless carrier to involve the Commission as part of its staff-assisted dispute resolution process. Cogeco argued that this language achieves more of the spirit of what the Commission has mandated, and that both RCCI and TCI should be directed to include language in their tariffs clarifying that wholesale roaming customers will have access to the Commission’s dispute resolution process.

Replies

20. Bell Mobility submitted that Eastlink and Xplore ignored a key portion of its proposed tariff. When read in full, it does not give Bell Mobility the unilateral ability to determine that seamless hand-off does not need to be provided:

No further Services for Seamless Handoff are required to be provided by the Company to the Wholesale Roaming Customer pursuant to this tariff item if the Company has determined that it is not feasible to implement Seamless Handoff, and the Company is not required to complete a Seamless Handoff Boundary Change if the Company has determined that it is not feasible to complete the Seamless Handoff Boundary Change, **if in each case the impediments to feasibility have not been resolved in accordance with the process set out in section 18.(a)(1)c.** [Emphasis added]

21. Bell Mobility indicated that it added the bolded portion to address the issue raised by the Commission. Bell Mobility indicated that where no impediments are identified upon completion of its Seamless Handoff Potential Implementation Review, it will provide the customer with a proposal for implementing seamless hand-off. In cases where it cannot be implemented, Bell Mobility will explain the impediment that it has identified. Bell Mobility committed to working together in good faith to overcome the impediments, and indicated that this is set out in items 100.18(a)(1)b and c of its proposed tariff. Bell Mobility submitted that item 100.18(a)(1)d clarifies that where a dispute on feasibility has arisen, it cannot go on forever. If the dispute cannot be resolved by mutual agreement, item 100.18(a)(1)c contemplates resolution through the Commission's staff-assisted dispute resolution mechanisms as a final step. Item 100.18(a)(1)d clarifies that the outcome of the process with the Commission ends the dispute, so if the outcome is that Bell Mobility's position that it is not feasible to implement the request is accepted, this will end its obligation to work with the customer on the request at issue.
22. Bell Mobility submitted that it is not attempting to grant itself the power to reject requests for seamless hand-off in all operating territories when a problem of technical feasibility is found in one operating territory, nor is it attempting to grant itself the power to reject requests for seamless hand-off for all technologies when a problem of technical feasibility is found for one technology. Bell Mobility added that nothing in the language of item 100.18(a)(2) suggests otherwise.
23. RCCI submitted that it modelled its Seamless Roaming Feasibility and Implementation Process on Bell Mobility's proposed tariff, as directed by the Commission.
24. In its response to a request for information (RFI), RCCI submitted that its intent was to clarify that the configuration and implementation of seamless roaming is a cooperative process and that, if some technical impediments are discovered, the regional wireless carrier is expected to work in good faith with RCCI to remedy the issue. In case the Commission rejects its provision, RCCI proposed modifying item 4.5.1(b) of its proposed tariff by removing the sentence stating that if the company determines that seamless roaming is not feasible, it will assist the wholesale roaming customer to identify solutions.
25. Regarding adding references to the Commission's dispute resolution process, RCCI argued that it is not necessary to include them in its tariff. The dispute resolution process has been available since the establishment of both third-party Internet access and wholesale mobile wireless roaming services, without inclusion in the tariffs, and parties using both services have made use of the process. Also, the Commission did not require RCCI to specifically include such wording in its tariff. Since the dispute resolution process is available at any point in RCCI's tariff, to include references to the process at only one point may create confusion.

26. Regarding the request that the technical feasibility language be removed, TCI submitted that given the lack of experience implementing seamless roaming in Canada and around the world, with many unknowns, seamless roaming might not be feasible in every situation. In TCI's view, if parties are required to work in good faith, feasibility language does not change that reality.
27. TCI submitted that it is committed to working together with regional wireless carriers to resolve issues. It noted that interveners supported including a reference to the Commission's dispute resolution mechanisms. TCI agreed to incorporate wording similar to Bell Mobility's language in its tariff, and proposed additional wording and numbering changes, including adding new item 233.3.8.h in response to an RFI.
28. Regarding the request that TCI delete language such as the proposed text in item 233.3.2.a.ii that allows TCI to deny service if the standards and industry guidelines have not been developed or widely adopted in Canada, TCI submitted that RCCI had previously proposed similar language, but the Commission did not comment on this language in Telecom Decision 2022-102; rather, the Commission made a ruling that applies specifically to RCCI. Also, TCI submitted that because it has not yet deployed 5G-SA networks, the rationale to include this language in its tariff remains. TCI added that it does not make sense that it must offer a wholesale service on a technology that it has not yet fully deployed.
29. Bell Mobility was of the view that TCI's proposed language reflects the reality of how roaming technologies are always deployed and will help avoid protracted disputes or major technical issues due to a regional wireless carrier insisting on implementation of a roaming service or functionality before it has been proven and fully implemented on the wholesale roaming provider's network. Bell Mobility recommended that the national wireless carriers be directed to include similar language in their tariffs.
30. Regarding Videotron's request that TCI change the word "may" to "shall" in the proposed description of seamless roaming service, TCI agreed, provided that the rest of the paragraph remains unchanged.
31. TCI also agreed with Videotron that it would be logical for TCI to provide the cell site information before a regional wireless carrier provides its initial seamless roaming implementation request. Accordingly, in its 3 June 2022 reply, TCI proposed certain modifications to item 233.3.8.a.i.

Commission's analysis

32. In Telecom Regulatory Policy 2021-130, the Commission directed the national wireless carriers to make seamless roaming a feature of their wholesale roaming service. No discretion was granted to the national wireless carriers to decide whether to fulfill this obligation based on their own feasibility assessments. The Commission found that technical standards and solutions exist to implement seamless hand-off between carriers. In Telecom Decision 2022-102, the Commission reiterated that

general standards and technical specifications exist to make seamless roaming feasible but noted that each arrangement between a national wireless carrier and a regional wireless carrier will be unique and customized. If technical impediments to implementing seamless roaming arise in the case of any given national wireless carrier and regional wireless carrier, the parties are expected to work together in good faith to overcome them and to use other means, including Commission staff-assisted dispute resolution.

33. Regarding item 100.18 – Feasibility and Implementation Process of Bell Mobility’s proposed tariff, the wording in item 100.18.(a)(1)c meets the direction from Telecom Decision 2022-102 for the national wireless carriers to remove any tariff wording that gives them the discretion to deny the provision of seamless roaming based on unilateral feasibility assessments. In particular, Bell Mobility did not state that it will deny the service in cases where impediments are identified. It offers a process for a wholesale roaming customer to address its disagreement with Bell Mobility’s assessment and requires the parties to work together in good faith to resolve the impediments or seek Commission staff-assisted dispute resolution on unresolved matters.
34. In addition, the proposed wording in item 100.18.(a)(1)d does not give Bell Mobility the discretion to deny access to the seamless hand-off service based on unilateral feasibility assessments. Specifically, it states that Bell Mobility will not provide the service only if in each case the impediments to feasibility have not been resolved in accordance with the process set out in item 100.18.(a)(1)c.
35. Regarding Videotron’s concern about the use of the expression “in all the circumstances” in item 100.18.(a)(2) of Bell Mobility’s proposed tariff, the Commission is of the view that this item states what the Commission has acknowledged, namely that while seamless roaming is technically feasible in general, there may be technical impediments in the case of each particular carrier. Because the expression is followed by “including consideration of the Parties’ equipment vendors and types, network design and deployment, and other features of the HPMN [home public mobile network] and Company Available PMN [public mobile network] and the services provided on them,” it is clear that it refers to any given request, not general circumstances.
36. Regarding the proposed changes to RCCI’s item 4.5.1.b, the Commission is of the view that the statement that RCCI will not unilaterally deny the provision of the service addresses some of the concerns raised by interveners.
37. With respect to interveners’ requests that RCCI add a reference to the Commission’s dispute resolution process, the Commission notes that in Telecom Decision 2022 102, it did not specifically direct the national wireless carriers to include such a reference in their tariffs. However, Bell Mobility and TCI did so. To alleviate the concerns of the interveners and to reflect the Commission’s intention more purposively, RCCI should also include such a reference in its tariff. This would also help achieve some consistency across the national wireless carriers’ tariffs.

38. In item 4.5.2, RCCI uses the same expression (“in all the circumstances”) as Bell Mobility and over which Videotron expressed its concern. For the reasons mentioned above regarding Bell Mobility’s item 100.18(a)(2), the Commission is not concerned by the use of this expression.
39. Regarding TCI’s item 233.1, the Commission notes that TCI agreed with Videotron to change the word “may” to “shall” to indicate that it is required to make available the seamless roaming service. With this change, Videotron’s concern is addressed. Also, as mentioned above, the Commission mandated the provision of seamless roaming, and the word “shall” is more appropriate to reflect that determination.
40. Regarding item 233.3.2.a of TCI’s proposed tariff, it would not make sense to require a national wireless carrier to offer a wholesale service or the seamless roaming functionality on a technology that it has not yet fully deployed. However, the Commission considers that this item should not be interpreted and used to unilaterally deny the provision of seamless roaming because of a technical impediment.
41. Regarding TCI’s feasibility assessment and related process, in its 13 September 2022 RFI response, TCI proposed changes to new item 233.3.8.h.⁶ The Commission considers that these changes address the concerns that TCI could deny the provision of seamless roaming based on a unilateral assessment. The proposed wording mentions that parties will work in good faith and that customers can access Commission staff-assisted dispute resolution.
42. With regard to the problem Videotron identified in item 233.3.8.a.ii.C, TCI agreed with Videotron that it would be logical for TCI to provide the cell site information before a regional wireless carrier has provided its initial seamless roaming implementation request. The Commission considers that the new wording that TCI provided for item 233.3.8.a.i addresses Videotron’s concern.

Conclusion

43. The Commission has reviewed the steps proposed by the national wireless carriers to operationalize seamless roaming and, with the exception of a concern discussed later in this order, the Commission finds that the proposed processes are appropriate.
44. In light of the above, the Commission
 - **directs** RCCI to, in item 4.5.1.b,
 - add a reference to the Commission staff-assisted dispute resolution process; and

⁶ TCI had originally proposed that this language be added as item 233.3.8.b.ii of its tariff and then sought to move that language to new item 233.3.8.h.

- apply the changes proposed by RCCI (i.e., remove the sentence stating that if the company determines that seamless roaming is not feasible, it will assist the wholesale roaming customer to identify solutions); and
- **directs** TCI to
 - change the word “may” to “shall” in item 233.1;
 - make the changes it proposed in its 3 June 2022 reply regarding the provision of cell site information in advance in item 233.3.8.a.i; and
 - make the changes it proposed in its 13 September 2022 RFI response regarding the feasibility assessment.

Availability of seamless roaming for use by the regional wireless carriers where they have in-footprint coverage gaps

Background

45. In Telecom Decision 2022-102, the Commission directed the national wireless carriers to revise their tariffs to clarify that seamless roaming should be available for use by regional wireless carriers where they have in-footprint coverage gaps.

Positions of parties

46. In general, interveners submitted that the national wireless carriers have not followed this direction.
47. Eastlink submitted that, as noted by the Commission, defined in-territory coverage boundaries do not exist in a wireless network, and requiring regional wireless carriers to submit maps that create such boundaries will make it challenging for these carriers to address coverage gaps.
48. Cogeco submitted that Bell Mobility proposed the following definition of an in-footprint coverage gap boundary, a concept that the Commission has explicitly discouraged, if not outright rejected, in previous rulings:

Item 100.1(a)(19): In-footprint Coverage Gap Boundary means the perimeter of a material geographic area within the HPMN coverage area identified by the Wholesale Roaming Customer as an in-footprint coverage gap, as shown on a coverage map provided by the Wholesale Roaming Customer to the Company and as agreed to by the Parties, where that perimeter falls within the Company Available PMN.

49. Xplore submitted that Bell Mobility’s definition is inconsistent with the use of roaming services.

50. Videotron submitted that dropped calls and data sessions do not suddenly become less concerning for consumers because Bell Mobility believes they are occurring in geographic areas that are “not material” or because they only occur “from time to time due to signal strength.” Videotron submitted that seamless hand-off can be made to function without difficulty in the types of areas described by Bell Mobility and requested that the words “material geographic area” and “from time to time due to signal strength” be removed from the proposed definitions of In-footprint Coverage Gap Boundary and Seamless Handoff Boundary. Iristel also supported the removal of the words “material geographic areas.”
51. Iristel submitted that RCCI’s definition should clarify that the wholesale roaming customer is responsible for identifying coverage gaps since the customer is best placed to know where it has coverage gaps in its network.
52. Similar to its comment regarding Bell Mobility, Cogeco submitted that TCI introduced a concept of an in-footprint coverage gap boundary, which the Commission has explicitly discouraged, if not outright rejected, in previous rulings.
53. Iristel submitted that in Telecom Decision 2022-102, the Commission did not require that coverage gaps be limited to areas where regional wireless carriers have no verifiable wireless network coverage. Iristel added that a coverage gap can also be an area where a regional wireless carrier has a weak signal and seamless roaming is required to prevent dropped calls. TCI’s proposal constitutes an excessively high threshold that would result in regional wireless carriers not being able to take advantage of in-footprint seamless roaming in many instances where it is required. Such an outcome would undermine the regional wireless carriers’ ability to be effective competitors.
54. Videotron submitted that TCI’s reference to “no verifiable wireless network coverage” would lead to unproductive conflicts. Pursuant to paragraph 106 of Telecom Decision 2017-56, each regional wireless carrier already has an obligation to take all reasonable steps to ensure that its end-users configure their devices to register on the regional wireless carrier’s own network in priority over all other available networks. This obligation sufficiently protects the national wireless carriers against undue in-footprint roaming and traffic offloading and does not need to be augmented by a restrictive new definition of Home Network Inner Boundary. Also, the suggestion that there exists a contiguous boundary of competitor cell sites around each coverage gap does not reflect the reality described in paragraphs 43-47 of Telecom Decision 2022-102 and should be removed.
55. Xplore submitted that in-footprint roaming is used in many circumstances and is much broader than the highly defined boundaries proposed by the national wireless carriers. The national wireless carriers have portfolios of spectrum holdings that allow them to provide service in difficult environments, such as inside buildings, but regional wireless carriers may not have such access, so roaming may be used for customers behind concrete walls. Similarly, the national wireless carriers often have radios placed within large venues such as stadiums and shopping malls. Roaming

services would be accessed within these environments to ensure customers can continue to access wireless services when attending events or shopping. Eastlink was also of the view that the national wireless carriers' tariff language will make it challenging for regional wireless carriers to address in-footprint coverage gaps in shopping malls, stadiums, and other venues.

56. Xplore argued that defined boundaries cannot be drawn around in-footprint gaps. In-footprint roaming is accessed pursuant to Telecom Decision 2017-56 through device programming. The device seeks out the home network of the regional wireless carrier, but when that signal is not available, the device will then look for the network of a roaming partner and connect to that network. It is entirely feasible for seamless roaming to be implemented in the same manner. Thus, seamless roaming should be available whenever roaming is required within a regional wireless carrier's network footprint. The national wireless carriers should therefore remove all concepts related to defining inner boundaries from their tariffs.

Replies

57. Bell Mobility submitted that some interveners are essentially asking for a forced integration of their networks with that of the wholesale roaming provider, across its entire footprint and entirely at the regional wireless carriers' discretion. This would undermine the core policy objectives of Telecom Regulatory Policy 2021-130, which include encouraging regional wireless carriers to invest in upgrading and expanding their own networks. It would be highly inefficient and prejudicial to its customers – as well as those of other regional wireless carriers – if any one regional wireless carrier could require seamless hand-off to be implemented on every one of Bell Mobility's cell sites because its network may provide better service than the regional wireless carrier's network does to some customers at some times in that immediate area.
58. Bell Mobility submitted that the request to expand seamless hand-off beyond the borders defined by regional wireless carriers' coverage gaps is out of scope and should be rejected. While in Telecom Decision 2022-102 the Commission purported to extend the availability of seamless hand-off to the boundaries of in-footprint coverage gaps, it continued to recognize the basic fact that seamless hand-off occurs at a border. Bell Mobility submitted that this is indeed what seamless hand-off involves, and without appropriate definitions of seamless hand-off boundaries and in-footprint coverage gap boundaries, the notion of seamless hand-off and mandated roaming becomes indistinguishable from unilateral forced network sharing.
59. Bell Mobility submitted that Cogeco and Xplore's requests go beyond covering gaps. Also, Bell Mobility disagreed that a defined coverage gap boundary that is identified by the regional wireless carrier would leave coverage dead zones. Regional wireless carriers would still have roaming access to Bell Mobility's network everywhere inside their coverage gaps (and elsewhere); it is just that they hand off from their network to Bell Mobility's network seamlessly only at the boundaries of those coverage gaps, as determined by the Commission.

60. Bell Mobility submitted that the reference to a material geographic area is not intended to allow it to unilaterally deny in-footprint seamless roaming to a customer by arbitrarily asserting that a coverage gap is not large enough. Rather, it uses typical commercial language to denote a reasonable limit and avoid an unreasonable assertion that there can be an infinite number of infinitesimally small coverage gaps, each with its own boundaries, which would undermine the Commission's intended result and require an unmanageably complex implementation.
61. In Bell Mobility's view, all parties should be focusing at least their initial implementation efforts on the edges of the regional wireless carriers' networks and on any large and easily defined coverage gaps. In the event that implementing seamless hand-off at those locations does not address the issues identified by the Commission in Telecom Regulatory Policy 2021-130, and where the Commission concludes that seamless hand-off is required (and possible) for coverage gaps in immaterial geographic areas, those coverage gaps could be addressed through commercial discussions or through further amendments to the tariff if required.
62. RCCI was unsure what rigid boundary wording Eastlink was referring to but argued that regardless, seamless roaming boundaries will always be rigid at any point in time, reflecting the exchange of cell site information and the setup of the boundary. RCCI added that, however, the boundary update process will allow for the contours to be constantly updated, up to once per month, so that the boundary remains fluid, consistent with the wording from Telecom Decision 2017-56. This flexibility directly addresses Eastlink's concern, and it is not necessary to remove wording describing a rigid boundary.
63. TCI argued that the Commission made it clear in Telecom Decision 2022-102 that seamless roaming is not to be restricted to the outer perimeter of the regional wireless carriers' networks but must also include in-footprint coverage gaps. TCI added that a gap is not the entirety of a regional wireless carrier's footprint but rather certain areas within its network footprint. TCI included language in its tariff to allow for the definition of both outer boundaries (Home Network Outer Boundary) and in-footprint coverage gaps (Home Network Inner Boundary) where seamless hand-off should occur.
64. TCI submitted that seamless roaming is not intended to expand the scope of incidental wholesale roaming to allow for permanent roaming or regular traffic offloading, and it is also not intended to expand other roaming obligations, such as providing additional in-building network coverage. The purpose is to continue an existing call or data session when the end-user leaves the regional wireless carrier's network and moves to TCI's network. This is accomplished by defining hand-off points along the boundaries of where those two networks meet – both at the outer network boundary, and within the regional wireless carrier's footprint for any coverage gaps.

65. TCI also submitted that the existing wholesale roaming tariffs state that wholesale roaming customers must take all reasonable steps to ensure that end-user devices are configured to register on the wholesale roaming customer's network in priority over all other available networks. TCI noted that Videotron considered this sufficient to protect the national wireless carriers. However, TCI was of the view that it has not yet been determined how seamless hand-off will be implemented with each regional wireless carrier, and how network selection and prioritization will occur. Accordingly, it may turn out to be necessary to configure the end-user device such that TCI's network is ranked in equal priority to the wholesale roaming customer's network to ensure that a voice call or data session would be seamlessly handed off to the TCI cell site while the device is in connected mode. In such a scenario, it would be necessary for the in-footprint network gaps to be defined so that this hand-off occurs only in areas that have network gaps.
66. TCI further submitted that Iristel seemed to accept the need to define the boundaries of a contiguous in-footprint coverage gap and that Iristel was primarily concerned with ensuring that there is seamless hand-off in gaps where there is a weak signal. TCI submitted that, however, if there is a weak signal with the home network provider, the call or data session should not hand off to the national wireless carrier; otherwise, there is no incentive for the home network provider to augment its weak network.

Commission's analysis

67. In Telecom Decision 2017-56, the Commission determined that in-footprint roaming and traffic offloading are appropriate. The Commission therefore directed the national wireless carriers to remove from their tariffs the proposed restrictions on in-footprint roaming and traffic offloading. The Commission mandated the provision of in-footprint roaming as part of the national wireless carriers' wholesale roaming service, indicating that there is no solid and stable boundary to a wireless network, and that coverage gaps are inherent to the nature of mobile wireless services. It determined that, given the overlapping nature of PMNs, in-footprint roaming is important to the quality of roaming services. The Commission also directed the national wireless carriers to add a clause that states that the wholesale roaming customer must take all reasonable steps to ensure that its end-users configure their devices to register on the wholesale roaming customer's network in priority over all other available networks where roaming is permitted, to minimize in-footprint roaming and traffic offloading.
68. In Telecom Regulatory Policy 2021-130, the Commission mandated the provision of seamless roaming and did not limit seamless roaming to the outer perimeter of a network; rather, it referred to the borders and edges of networks. This includes borders and edges within a footprint where coverage gaps exist, as well as the outer perimeter. As the Commission indicated in its 21 July 2022 [letter](#) denying Bell Mobility's application to review and vary Telecom Decision 2022-102, the scope of the seamless roaming requirement was never limited in Telecom Regulatory Policy 2021-130 to the outer perimeter of the network and included in-footprint coverage gaps.

69. In Telecom Decision 2022-102, the Commission considered it important to enable regional wireless carriers' end-users to roam seamlessly in the coverage gaps that are inherent to mobile wireless networks, but also considered it important that the regional wireless carriers build out their networks to fill in those gaps. The Commission was of the view that in-footprint coverage gaps create a border between the regional wireless carriers' and national wireless carriers' networks, and that there is a need to provide seamless roaming along that border. The intent was to minimize dropped calls and data sessions to benefit consumers and enhance competition. The Commission was of the view that restricting seamless roaming to the outer perimeter of the regional wireless carriers' networks would work against this objective since customers who unknowingly enter a coverage gap would have their calls and data sessions dropped. Accordingly, the Commission found that it would not be appropriate to limit the provision of seamless roaming to the outer edges of a regional wireless carrier's network.
70. Further, the Commission did not make determinations regarding the size or the type of coverage gaps. Since the objective of mandating seamless roaming is to minimize dropped calls and data sessions, the Commission considers that it should be available even where the coverage gaps are small.
71. The Commission is of the view that Bell Mobility's use of "material geographic area" could be used to deny small coverage gaps. The Commission therefore considers that requiring Bell Mobility to remove that expression would respect the objective of mandating seamless roaming and align with the Commission's determinations in its 21 July 2022 letter.
72. Regarding RCCI's proposed wording, the Commission considers that it is appropriate and that it respects the determination in paragraph 47 of Telecom Decision 2022-102. However, Iristel proposed a modification to indicate that the coverage gaps will be identified by the wholesale roaming customer. Additionally, Bell Mobility included such specification in its definition. The Commission considers that it would be appropriate for RCCI to include such language in its tariff.
73. Regarding TCI's proposed wording, Videotron argued that the expression "contiguous boundary" should be removed. As mentioned above, in past decisions, the Commission referred to borders, but the Commission did not state that these borders were or had to be contiguous. Also, the Commission considers that, given the nature of mobile wireless services, there can be many small coverage gaps within the regional wireless carrier's coverage area and those gaps are not necessarily contiguous. Therefore, it is unnecessary to use the word "contiguous" in the definition of Home Network Inner Boundary.
74. The Commission also considers that TCI's reference to "no verifiable wireless network coverage" in the definition of Home Network Inner Boundary puts a threshold that was not envisioned in related past Commission decisions and that it raises questions regarding how the coverage would be verified. Therefore, this language should be removed. However, the text that appears in parentheses – "(i.e. a network "coverage gap" as referred to in paragraph 44 of Telecom Decision CRTC 2022-102)" – is appropriate.

75. As with RCCI's tariff, TCI's tariff should indicate that the coverage gaps will have to be identified by the wholesale roaming customer.
76. Regarding submissions that the national wireless carriers' definitions of in-footprint coverage gaps should include areas such as inside buildings, shopping malls, stadiums, and other venues, the Commission's objective in mandating seamless roaming is to minimize dropped calls and data sessions that are detrimental to consumers. Seamless roaming's functionality is to continue an existing call or data session when the end-user leaves the regional wireless carrier's network and moves to the national wireless carrier's network. Therefore, the Commission intended for seamless roaming to compensate for a weak signal inside buildings, shopping malls, stadiums, and other venues, so that consumers can fully benefit from this functionality.

Conclusion

77. In light of the above, the Commission **directs**
- Bell Mobility to remove the expression "material geographic area" from item 100.1.a.(19);
 - RCCI and TCI to amend their proposed tariffs to indicate that the coverage gaps will have to be identified by the wholesale roaming customer; and
 - TCI to remove the words "contiguous" and "no verifiable wireless network coverage" from its definition of Home Network Inner Boundary.

Timelines for implementation of operational seamless roaming upon request

Background

78. In Telecom Decision 2022-102, the Commission directed the national wireless carriers to work in good faith to have seamless roaming operational within 90 days of receiving a regional wireless carrier's request.

Positions of parties

79. The interveners were concerned that the national wireless carriers did not reflect the 90-day deadline in their proposed tariffs and had proposed implementation processes that contain burdensome steps that do not appear likely to be completed within 90 days.
80. Eastlink submitted that Bell Mobility's proposed tariff states that the Commercial Starting Date for Seamless Handoff is the date agreed to by both parties after successful completion of the process outlined in Section 18 and all network and billing test procedures. Given the requirement for a Seamless Handoff Potential Implementation Review prior to the start of the implementation process, it is unlikely that the process described by Bell Mobility would be completed in 90 days.

81. Eastlink and Videotron were concerned with RCCI's proposed timelines. Eastlink and Videotron submitted that RCCI's proposed tariff suggests that it is only after the wholesale roaming customer has gone through the Seamless Roaming Potential Implementation Review, for which there are no prescribed timelines, that it may initiate a Seamless Roaming Set-Up request. Furthermore, it is only following receipt of such a request that RCCI will work to make the service operational within 90 days, or another timeline mutually agreed upon by both parties. Eastlink argued that RCCI's proposed process not only delays when a request can be made, but once the request is made, the process will clearly not allow the service to be operational within 90 days. Videotron submitted that the starting point for the 90-day initial implementation timeline should be the date the regional wireless carrier first requests seamless hand-off.
82. Xplore and Videotron added that the way RCCI referenced the 90-day implementation requirement prevents RCCI from having any kind of obligation to meet the deadline: "Service may be operational within 90 days of receipt of the request or a timeline mutually agreed upon by the Parties."
83. Eastlink submitted that TCI outlined its multi-step implementation process but did not provide any reference to the Commission's 90-day timeline or any other expectations on how long the process will take. Eastlink added that the 90-day timeline should not be circumvented by establishing preliminary review processes that fall outside the 90-day timeline.

Replies

84. The national wireless carriers submitted that the 90-day timeline was not a strict deadline, and that there are reasons why, despite them working in good faith to meet a 90-day timeline for implementation, a strict deadline would not be appropriate.
85. Bell Mobility submitted that its proposed tariff broadly outlines a two-step process in response to a regional wireless carrier's initial request for seamless roaming – the Seamless Handoff Potential Implementation Review, and the implementation phase. This approach reflects the reality that seamless roaming has never been implemented in practice by most of the carriers and would require a customized solution when being implemented between two specific carriers, given the unique features of each network. The first step in responding to a request must be a review of whether and how it is technically feasible to implement seamless roaming between the two specific carriers in light of the unique features of each network. Given that both parties will be seeking to implement seamless hand-off potentially for the first time, this step is necessary to prevent the parties from wasting time and resources on specific implementation options that may ultimately be determined to be technically unfeasible.
86. Bell Mobility added that it will respond to a regional wireless carrier's request with a proposed non-disclosure agreement as well as an initial request for information. Then, it will promptly review information received and provide any necessary

follow-up requests for information without undue delay. Upon receipt of complete information, its network teams will complete their technical analysis and Bell Mobility will provide the requesting carrier with a proposed implementation plan. The implementation phase will then be defined by the parties together based on the results of the review. Because the process requires input from both the wholesale roaming customer and Bell Mobility, Bell Mobility cannot unilaterally ensure that seamless roaming is launched within a specified time; the process is designed to ensure that implementation takes place within 90 days if the wholesale roaming customer is appropriately responsive.

87. Finally, Bell Mobility noted that mechanisms already exist for the Commission to intervene if there is a concern that a carrier is not complying with its direction. Adding a strict deadline in the tariff would not change anything in practice; rather, it would result in further complexity in the ultimate tariff terms.
88. RCCI submitted that since much of the implementation process will be defined in the Implementation and Feasibility Report and subject to the wholesale roaming customer's resource constraints, it is very likely that a mutually agreed-upon alternative timeline will need to be established. This is because the work, resources, and amount of time needed to deploy the service is highly dependent on each regional wireless carrier's network technology and how it interconnects with RCCI.
89. RCCI noted that there only exist general standards and no specific industry guidelines for seamless roaming. Therefore, each implementation of seamless roaming must be customized, further adding an unknown amount of time to the process.
90. RCCI submitted that under the interveners' proposals, the receipt of a request for seamless roaming would begin the 90-day clock. In its view, this is unreasonable, since complete information is necessary to begin the implementation work. Starting the clock upon receipt of all required information is consistent with other Commission procedures when calculating timelines. Faulty or incomplete requests will lead to delays that are out of RCCI's control, and it should not be penalized for these issues.
91. RCCI submitted that it has already begun work in good faith and in anticipation of its first seamless roaming request so as to minimize the time required for the implementation process. Also, while the first implementation of the service may require more than 90 days, subsequent requests should reduce the time required.
92. TCI submitted that each instance of seamless roaming will require a custom implementation. TCI endeavored to provide significant detail about the implementation process and requirements to be clear and transparent with all parties. TCI's tariff sets out three distinct phases following the submission of a seamless roaming request in (i) High Level Implementation Assessment, (ii) Drafting and Finalization of the Statement of Work, and (iii) Detailed Solution Design, Testing, and Implementation. At the first stage, it will provide an initial estimate to the

wholesale roaming customers, in advance, to estimate the timelines, effort, and costs required to complete the implementation.

93. TCI indicated that much of the required information will come from the regional wireless carriers, who will also be responsible for elements of the Statement of Work, detailed solution design, testing, and implementation. Therefore, both parties must work in good faith to provide the required information and actively participate in the process. TCI added that it is not aware of any issues with the provision of its roaming services and is committed to exercising good faith to implement seamless roaming within 90 days of receipt of a request.

Commission's analysis

94. In Telecom Decision 2022-102, the Commission stated the following:

69. ...The Commission **directs** the national wireless carriers to begin accepting written requests for seamless roaming from regional wireless carriers effective **immediately** and work in good faith to have the service operational for a requesting regional wireless carrier within **90 days** of receiving a request. The 90-day deadline may be extended upon mutual agreement between a national wireless carrier and a requesting regional wireless carrier.

95. There is disagreement among the interveners and national wireless carriers as to when the 90-day timeline begins and on whether it will be possible to effectively implement seamless roaming in that time frame using the national wireless carriers' proposed implementation processes.
96. In Telecom Decision 2022-102, the Commission did not direct the national wireless carriers to provide seamless roaming in 90 days, but rather clearly directed them to work in good faith to make it operational within that time frame. Given that the Commission directed the national wireless carriers to file updated tariffs to reflect the determinations in that decision, the tariffs must reflect the 90-day timeline and indicate that the national wireless carriers will work in good faith to respect this timeline. The national wireless carriers' tariffs should not, in effect, undercut the objective of implementing seamless roaming within 90 days by using terms and conditions, like definitions or processes, that delay the start date of the timeline.
97. The Commission acknowledges that seamless roaming implementation will require an exchange of information between the parties, as well as discussions, negotiations, and assessments. In Telecom Decision 2022-102, the Commission considered that the tariffs must set out the process and steps to operationalize seamless roaming following receipt of a request from a regional wireless carrier. That said, the record of this proceeding does not contain sufficient information for the Commission to make determinations on the necessity of each step proposed by the national wireless carriers or the length of time reasonably required to complete it.

98. However, the Commission indicated in Telecom Regulatory Policy 2021-130 and Telecom Decision 2022-102 that seamless roaming should be implemented rapidly, hence the direction to work in good faith to have it operational within 90 days. Furthermore, the Commission has stressed the importance and the benefits for consumers and for competition in the telecommunications market that seamless roaming would provide. The Commission considers that its use of the expression “following receipt of a request” indicates that the assessment of what will be required is one step of the implementation process. Accordingly, these preliminary steps must be included in the 90-day timeline. The Commission’s intention was for the 90-day timeline to start on the day the national wireless carrier receives the initial written request (i.e., the first time a regional wireless carrier expresses its interest, in writing, to have seamless roaming), and to include any implementation review processes or assessment steps the tariffs set out.
99. Several interveners raised concerns with the sentence “Service may be operational within 90 days of receipt of the request or a timeline mutually agreed upon by the Parties” in RCCI’s tariff. The Commission is also concerned that the language of “may be operational” does not demonstrate the commitment to the 90-day timeline. To better reflect it, RCCI should modify its tariff to indicate that the company will work in good faith to make the service operational within 90 days.

Conclusion

100. In light of the above, the Commission **directs** the national wireless carriers to amend their tariffs to state that the timeline for the implementation of seamless roaming starts when they first receive a request from a regional wireless carrier, and includes any implementation review processes or assessment steps. The Commission also **directs** RCCI to amend its tariff to indicate that it will work in good faith to make the service operational within 90 days or a mutually agreed-upon timeline.

Updates to cell site information, boundary changes, and the corresponding adjustments to the national wireless carriers’ networks

Background

101. In Telecom Decision 2022-102, the Commission determined that regional wireless carriers “are to provide updated cell site information to their wholesale roaming providers no more than once per month, in a standard format that is to be described in the tariffs. Upon receiving updated regional wireless carrier cell site information, the national wireless carrier is to make the necessary adjustments to its network within 30 days. National wireless carriers are to provide their updated cell site information to a regional wireless carrier within 7 days of receiving a request.”

Positions of parties

102. Eastlink and Iristel submitted that Bell Mobility and RCCI failed to create a standardized format for the provision of cell site information. Eastlink submitted that Bell Mobility did not provide any detail on what sort of information will be required

and that RCCI suggested that the process for updating network border information will be described and agreed upon in the Seamless Roaming Potential Implementation Review. Iristel was of the view that because regional wireless carriers will not know in advance the information required to update cell site information, there will be delays in the implementation of seamless roaming. Iristel added that the absence of a standard format also creates a risk whereby Bell Mobility and RCCI may unilaterally change the information requirements or impose unreasonable requirements that further delay the implementation. Iristel submitted that these companies are fully capable of knowing what information they require and to set these informational requirements in a standard format in their tariffs.

103. Xplore submitted that TCI's proposed process for cell site information updates (using the same process as for implementation of seamless roaming) cannot be completed within 30 days as the Commission has required. The national wireless carriers should not only be required to codify the 30-day timeline for making cell site adjustments in their tariffs, but should also be directed to implement efficient and streamlined implementation processes that can be reasonably completed within the mandated time period.
104. Videotron submitted that item 800.4.5.1 of RCCI's proposed tariff suggests that there is no distinction between the process for the initial implementation of seamless roaming and the process for implementing or updating boundary changes. Therefore, it appears both processes are subject to a 90-day timeline. Videotron submitted that this is a clear violation of the Commission's direction in Telecom Decision 2022-102.
105. Eastlink and Videotron submitted that although TCI indicated what information it requires to update cell site information, it requires the wholesale roaming customer to go through the initial implementation process again.
106. Eastlink submitted that TCI did indicate that for a single boundary change, some of the original information could be reused or resubmitted, but that it is unclear what is meant by a "single network boundary change." Once the carrier has gone through the initial implementation process, it should not be necessary to go through the entire process again. Videotron argued that the process outlined makes the 30-day timeline unattainable.
107. Videotron submitted that TCI's and RCCI's tariffs must clearly separate the process for initial implementation from the process for boundary changes, and must include in the latter process only the elements that are necessary and can be reasonably completed within 30 days.
108. Videotron submitted that the proposed information exchange processes did not include any way for regional wireless carriers to know whether changes have been made to the national wireless carriers' cell sites in areas where seamless roaming has already been implemented. Knowledge of such changes is essential to ensure that the quality and reliability of seamless hand-off is maintained. Videotron recommended

that a notification be integrated into the monthly process for boundary changes. Specifically, if the parties have a fixed date each month on which the regional wireless carrier can request boundary changes, the national wireless carriers should be required to advise the regional wireless carrier 14 days before that date of any cell site changes made in the areas already covered by seamless hand-off. This would enable the regional wireless carrier to put forward any necessary seamless roaming adjustments as part of the monthly boundary change process.

Replies

109. In response to interveners, Bell Mobility provided a proposed standard format. It submitted that if this standard format is not sufficient in a particular circumstance, it will revisit the format with the relevant carrier at that time.
110. Bell Mobility submitted that its boundary change process is consistent with the Commission's direction in Telecom Decision 2022-102 and that the process outlined in item 100.8(g)(1) of its proposed tariff incorporates the timelines. Specifically, the timeline starts with Bell Mobility providing, without undue delay, the regional wireless carrier with confirmation of the receipt of all the information required. This reasonably anticipates that there may be some discrepancies in the information to resolve before the change process can commence.
111. Bell Mobility submitted that for changes to seamless hand-off boundaries by an existing customer, the key steps and requirements are as follows:
- The customer provides a written request to Bell Mobility that contains the information requested in item 100.8(g)(1).
 - Bell Mobility reviews the information and either confirms that it has received complete information or requests additional information, without undue delay. At this time, it may propose to the customer an estimated extended timeline to provide a response with its candidate cell sites if necessary.
 - Bell Mobility analyzes the request to identify candidate cell sites in its network in the vicinity of the proposed boundaries that would enable seamless hand-off.
 - Within seven days of providing its confirmation of receiving complete information or, if necessary, within an extended timeline agreed upon by the parties, Bell Mobility provides the customer with proposed cell sites in its network.
 - The parties work together to produce a statement of work (with agreed-upon timelines) that sets the defined boundaries corresponding to the request and outlines what each party will do to implement the boundary change.
 - Bell Mobility performs the necessary configuration, testing, and adjustments on its network within 30 days of sending its confirmation of complete information, or within the timeline agreed upon by the parties in the statement of work.

112. RCCI submitted that it modelled its Seamless Roaming Feasibility and Implementation Process on Bell Mobility's proposed tariff, as directed by the Commission, and that its tariff allows customized seamless roaming implementation. A more prescriptive approach to the implementation process would require constant updates to the tariff. Notwithstanding the above, should the Commission require a more prescriptive approach, RCCI would not be opposed to the wording proposed by TCI in item 233.3.8.a.ii of its proposed tariff.
113. Regarding the steps and timelines for updated cell site information, RCCI submitted that most changes will fall under the regional wireless carrier's responsibility. Further, the initial implementation with each regional wireless carrier will include various steps, procedures, and service level agreements for the parties to coordinate implementation, to be agreed upon as part of the Seamless Roaming Feasibility and Implementation Process.
114. In general, the regional wireless carrier will need to notify RCCI within the agreed-upon time frame or risk not having seamless roaming enabled at any new cell sites. The information will need to include the anticipated operational date of the cell site, the cell site location, and confirmation that the new cell site does not deviate from the agreed-upon design parameters. In these limited cases, the need to update cell site information will be the regional wireless carrier's responsibility. The flow of information between parties will be established within the Seamless Roaming Feasibility and Implementation Process and once the service is underway, it can be revised in a mutually agreed-upon manner.
115. TCI agreed with Videotron that it would make sense to set a date to provide any relevant changes to TCI's network cell site information before the wholesale roaming customer is to provide its monthly network boundary changes to TCI. This could be mutually agreed upon and set out in the statement of work, provided that TCI is not mandated to provide its updated cell site information more frequently than once per month. TCI indicated that if parties wish to deviate from these requirements, they should be able to do so via commercial agreement.
116. TCI submitted that each streamlined process for simple boundary changes should be mutually agreed to, since the process may differ depending on the regional wireless carrier's wireless network. As for information requirements, TCI indicated that it included language stating that "for a single network boundary change, it is anticipated that some of the information originally provided as part of the original seamless roaming request could be re-used and re-submitted." For boundary modifications, changes to cell site information would still be required. TCI would need to check and validate the TCI sites, input the new configuration, and implement the change within its maintenance window. Parties would need to agree upon the testing and validation activities required for simple boundary changes.
117. TCI noted that the Commission had stated that upon receipt of updated cell site information for the purpose of boundary changes, "the national wireless carrier is to make the necessary adjustments to its network within 30 days." TCI also noted that

Xplore and Videotron requested that the 30-day time frame be included in the tariff. TCI proposed making the following changes to item 233.3.8.e.iii (deletions are shown as struck out and additions are shown in bold italics):⁷

For a ~~single~~ **simple** network boundary ~~change~~ **changes**, it is anticipated that some of the information originally provided as part of the original seamless roaming request could be re-used and re-submitted. ***Upon receipt of the necessary information, the Company will use commercially reasonable efforts to make the requested adjustments to the Home Network Outer Boundary and/or the Home Network Inner Boundary, as the case may be, within thirty (30) days, subject to any unforeseen technical issues that may arise prior to completion or any delays caused by the Wholesale Roaming Customer.***

118. TCI submitted that because any subsequent changes (including network boundary changes) must go through the project phases outlined in item 233.3.8.a through d, if there are disagreements about the technical issues, then TCI's new proposed item 233.3.8.b.ii would apply – the parties will work together in good faith to resolve issues and, failing that, parties can also avail themselves of the Commission's staff-assisted dispute resolution mechanisms.
119. TCI agreed with interveners that it is not necessary to go through the entire implementation process again to enact a boundary change, provided that it is a simple boundary change and does not involve additional modifications to the seamless roaming service or any of the underlying technologies or operations, such as a change to the radio access network, core software loads, or vendor.
120. In its response to an RFI regarding steps and timelines for updating cell site information, TCI submitted that there are different types of such updates; some may only be informational in nature, while others will require TCI to implement changes on its network that must be undertaken during a maintenance window. TCI proposed a new item 233.3.8.g regarding steps to update a regional wireless carrier's cell site information. TCI indicated that any changes to cell site information which necessitate or are part of a seamless roaming boundary change shall follow the process set out in item 233.3.8.f.
121. Regarding the reason why the process outlined in items 233.3.a through d would have to be undertaken every time, TCI submitted that it anticipates that this process will be streamlined, depending on the nature and scope of the boundary changes. TCI reviewed the process proposed by Bell Mobility in the section entitled Seamless Handoff Boundary Change Process in item 100.8(g), and indicated that the process incorporates elements of TCI's proposed tariff language and reflects the required streamlined steps for implementing a network boundary change. Therefore, TCI proposed adding definitions for "Seamless Roaming Boundary" and "Seamless Roaming Boundary Change" to its GSM-based Roaming Service Tariff. TCI also

⁷ The first sentence of this text includes other proposed changes mentioned in TCI's intervention.

proposed amending item 233.3.8.e to remove reference to boundary changes for seamless roaming and item 233.3.8.f to better reflect the streamlined process for seamless roaming boundary changes.

Commission's analysis

122. Bell Mobility and TCI provided a standard format for information exchange and, accordingly, have met the Commission's direction. In contrast, RCCI did not include a standardized format for the provision of cell site information, stating that this would allow for each implementation of seamless roaming to be customized for the customer. In the alternative, RCCI indicated it was not opposed to using the wording proposed by TCI in item 233.3.8 of its tariff. The Commission considers that it would be appropriate for RCCI to adopt TCI's proposed wording regarding the format.
123. It is important for both the national and regional wireless carriers to have up-to-date cell site information. As the regional wireless carriers' networks grow, they require up-to-date cell site information from the national wireless carriers to implement border changes. If there are border changes in the regional wireless carriers' networks, these carriers must notify the national wireless carriers of the changes by providing cell site information. In the Commission's view, there is a divergence in how the national wireless carriers interpreted the determinations regarding the exchange of cell site and border information. As a result, the Commission will provide additional clarity as to its intended timelines for the exchange of cell site information between the carriers for their distinct purposes.
124. For clarification, the Commission's intended timeline set out in Telecom Decision 2022-102 for the exchange of information is as follows:
 - (i) The regional wireless carrier requests information about the national wireless carrier's cell site(s) from the national wireless carrier.
 - (ii) In response, the national wireless carrier provides the information to the regional wireless carrier within seven days.
 - These two steps can be performed at any time and there is no limit on the number of times the regional wireless carrier can make these information requests.
 - (iii) The regional wireless carrier provides its updated cell site information to the national wireless carrier in order to request boundary changes.
 - The regional wireless carrier is to provide its updated cell site information to the national wireless carrier not more than once per month and the information has to be provided in the standard format described in the national wireless carrier's tariff.

(iv) In response, the national wireless carrier has 30 days to implement the necessary adjustments to its network.

125. Items (i) and (ii) above involve the exchange of cell site information outside of the boundary change process, while items (iii) and (iv) represent the exchange of cell site information for the purposes of implementing boundary changes as the regional wireless carriers' networks grow.
126. Pursuant to Telecom Decision 2022-102, while the national wireless carriers are to work in good faith to implement seamless roaming in 90 days, their cell site information updates in response to regional wireless carriers' updated network borders are to be implemented in 30 days. The Commission considers that it contemplated a quicker process for cell site updates than for the initial implementation of seamless roaming.
127. Bell Mobility's proposed tariff does not take into consideration the exchange of cell site information outside of a regional wireless carrier initiating the boundary change process. The Commission considers that Bell Mobility should add a tariff item to allow a regional wireless carrier to request such information at any time, and that Bell Mobility should provide the information within seven days.
128. Concerns were raised that (i) RCCI's and TCI's proposed tariffs require regional wireless carriers to go through the initial implementation process again when they want to update cell site information, and (ii) all the steps could not be completed within 30 days.
129. TCI's proposed changes in its RFI response dated 13 September 2022 adequately address interveners' concerns regarding the timeliness of the process for exchanging cell site information for boundary changes. However, similar to Bell Mobility's tariff, TCI's tariff does not take into consideration the exchange of cell site information outside of a boundary change process. Therefore, TCI should add an item in its tariff to allow regional wireless carriers to request cell site information at any time, and TCI should provide the information within seven days.
130. With respect to RCCI, the Commission has concerns that regional wireless carriers are required to go through the Seamless Roaming Feasibility and Implementation Process set out in item 800.4.5.1 for the exchange of information on changes to cell sites and borders. It is reasonable to expect that the process would be more detailed and have more steps at the initial stage of seamless roaming implementation, and that it would be less burdensome for the subsequent cell site information updates. Cell site updates can happen on a regular basis, so the process for handling them should be faster for the proper operation of the seamless roaming functionality. RCCI should separate the process for initial implementation and the process for updates, and adopt TCI's approach. Finally, RCCI should also clarify in item 800.5.2.3 that a regional wireless carrier can request RCCI's updated cell site information at any time and outside of a boundary change process.

131. With respect to Videotron's request that notification to regional wireless carriers of any changes to the national wireless carriers' cell sites be integrated into the monthly process for boundary changes, the Commission has clarified that regional wireless carriers can request updated cell site information at any time from the national wireless carriers. As a result, regional wireless carriers will have a way to know if there were changes made by the national wireless carrier and if changes requested by the regional wireless carrier in the past were appropriately implemented. Therefore, it is not necessary that a notification be integrated in the process for boundary changes. If Videotron wants to receive such notifications before a fixed date, it can propose that this step be added when it discusses the implementation of seamless roaming with a national wireless carrier.

Conclusion

132. In light of the above, the Commission clarifies that the exchange of cell site information, whether it relates to border changes or not, is to be completed within seven days.

133. Further, the Commission **directs**

- RCCI to adopt TCI's wording set out in item 233.3.8.a.ii regarding the standard format to be used by the regional wireless carrier to provide the cell site information.
- TCI to implement the changes it proposed in its RFI response dated 13 September 2022;
- RCCI to revise its proposed tariff to (i) separate the process for initial implementation and the process for updates, and (ii) adopt the proposed wording in TCI's RFI response dated 13 September 2022 (specifically, the wording for TCI's item 233.3.8 in Appendix 1 to this order and the necessary associated changes, such as adding definitions); and
- the national wireless carriers to ensure their tariffs reflect that a regional wireless carrier can request up-to-date cell site information at any time (i.e., not only within the context of a boundary change request), and that the national wireless carriers provide such information within seven days.

Availability of direct interconnection

Background

134. In Telecom Decision 2022-102, the Commission determined that indirect interconnection would remain the mandated form of interconnection for wholesale roaming. Because carriers are permitted to enter into off-tariff agreements, direct interconnection arrangements could be negotiated between parties.

135. However, in that decision, the Commission was of the view that direct interconnection may eventually be preferred where 5G network deployment prevails over 4G/LTE [long-term evolution] technologies and that direct interconnection will be required for effective 5G-enabled applications. The Commission was concerned that denying direct interconnection between 5G core networks would harm competition. It therefore took the preliminary view that failure by the national wireless carriers to provide regional wireless carriers with direct interconnection between 5G-SA core networks, while they directly connected with other national wireless carriers, would raise concerns of undue preference or unreasonable disadvantage.
136. Accordingly, the Commission directed the national wireless carriers to (i) notify regional wireless carriers of the availability of, and work in good faith to implement, direct interconnection upon request when the national wireless carriers deploy a 5G-SA core network; and (ii) file tariff updates reflecting this direction.

Positions of parties

137. Videotron submitted that because RCCI has already deployed a 5G-SA network, it must immediately offer 5G-SA roaming and seamless hand-off (including Voice over New Radio [VoNR]⁸ roaming and seamless hand-off) in its tariff. Although the timing of the implementation is subject to technical feasibility, this does not alter RCCI's explicit obligation to include an immediate offer of the service in its tariff.
138. Videotron referred to paragraphs 122 and 123 of Telecom Decision 2022-102 and submitted that off-tariff agreements for direct interconnection are to apply in situations where conditions have not yet been met for on-tariff direct interconnection. Videotron argued that RCCI ignored this in item 800.4.3 of its proposed tariff and that RCCI should delete from this item the references to direct interconnection being off-tariff and being configured at the sole discretion of RCCI. It submitted that these references should be replaced by text referring to RCCI's obligation to work in good faith to implement direct interconnection upon request, with possible recourse to the Commission for dispute resolution if parties cannot agree on direct interconnection arrangements.
139. Iristel proposed revised wording for item 800.4.3 that would ensure that RCCI is not solely responsible for determining the direct interconnection configuration or making it subject to a commercial agreement outside the tariff.

Replies

140. RCCI submitted that it has removed language stating that indirect interconnection is the only form of interconnection and replaced it with language stating that direct interconnection is available as a non-mandated option. RCCI disagreed with Videotron's submission that the tariff should state that direct interconnection is part

⁸ VoNR refers to voice calls on 5G networks.

of the mandated service. It argued that Videotron misinterpreted the Commission's direction; the availability of direct interconnection is not mandated and the proposed wording remains appropriate. Should a regional wireless carrier request direct interconnection, the request will be considered on an off-tariff basis.

141. In response to Iristel's view that the wording for the availability of direct interconnection was too restrictive, RCCI proposed modifications to refer to a mutually agreed-upon configuration, which would be more consistent with the Commission's direction in Telecom Decision 2022-102 (deletions are shown as struck out and additions are shown in bold italics):

A direct interconnection may be requested by the Wholesale Roaming Customer. The configuration of this interconnection will ~~solely be determined by Rogers~~ ***be mutually agreed upon by Rogers and the Wholesale Roaming Customer*** and is subject to commercial agreement outside the confines of this tariff.

142. TCI submitted that it would amend its proposed tariff to add references to 5G-SA roaming and direct interconnection once wholesale roaming is available on its 5G-SA core network.

Commission's analysis

143. In item 800.4.3, as modified in its response to Iristel, RCCI proposed that regional wireless carriers may request direct interconnection, but that such a configuration would be mutually agreed upon between them and RCCI, and would be subject to commercial agreement outside the tariff. RCCI provided no rates, terms, or conditions for the offering or implementation of direct interconnection. In RCCI's view, this reflects its interpretation that the Commission did not mandate the national wireless carriers to provide direct interconnection.
144. In Telecom Decision 2022-102, the Commission expressed its concern that without direct interconnection, the national wireless carriers would have a head start over regional wireless carriers when it comes to 5G deployment, which could harm competition. The Commission provided the preliminary view that concerns about unjust discrimination or undue preference would arise if the national wireless carriers were directly connecting among themselves but not with competitors. If the key details of direct interconnection are left only to commercial agreements, anti-competitive, discriminatory, or preferential treatment may arise (e.g., the national wireless carriers using negotiations to delay the actual provision of direct interconnection). The Commission is concerned that RCCI's former proposed wording in item 800.4.3 (that the configuration of direct interconnection was solely in RCCI's discretion) is an example of a provision potentially yielding concerns regarding anti-competitive, discriminatory, or preferential conduct. Such conduct would be contrary to the achievement of the policy objectives of the wholesale roaming framework.

145. Taking into account the diverging interpretations of whether the Commission mandated roaming using direct interconnection in 5G-SA networks, it would be appropriate to clarify the determinations regarding the availability of direct interconnection and how this availability should be reflected in the national wireless carriers' tariffed terms and conditions.
146. The Commission clarifies that its intention in Telecom Decision 2022-102 was that the provision of direct interconnection in wholesale roaming provided upon 5G-SA network deployment is mandatory, and that this must be reflected in the tariffs. In those circumstances, direct interconnection must be made available, at the option of the regional wireless carrier, and off-tariff agreements may also be made for different interconnection arrangements.
147. Accordingly, it would be appropriate to require the national wireless carriers to file tariff provisions that reflect the terms and conditions for offering direct interconnection, which includes providing direct interconnection, at the regional wireless carrier's option, when they notify regional wireless carriers of the launch of a 5G-SA network.
148. Finally, the Commission considers reasonable RCCI's proposed wording to address Iristel's concern that RCCI's tariff appears to grant itself the power to determine the configuration. RCCI's proposed wording to refer to a mutually agreed-upon configuration addresses this concern.
149. As of the time of the publication of this order, the Commission notes that RCCI has deployed a 5G-SA core network, and so its obligations in respect of the provision of direct interconnection arise immediately.

Conclusion

150. In light of the above, the Commission clarifies that the national wireless carriers are required to offer, as an option, direct interconnection configurations in 5G-SA networks. Accordingly, the Commission
- **directs** RCCI to (i) replace "solely be determined by Rogers" with "be mutually agreed upon by Rogers and the Wholesale Roaming Customer", and replace "is subject" with "can be subject" in item 800.4.3 of its proposed tariff; and (ii) file for approval proposed terms and conditions for the offering of direct interconnection by **27 June 2023**; and
 - reminds Bell Mobility and TCI that they are to file proposed tariffs for the offering of direct interconnection when they notify regional wireless carriers of the launch of a 5G-SA core network.

Requirements regarding 5G

Background

151. In Telecom Regulatory Policy 2021-130, the Commission confirmed that its wholesale roaming policy applied to 5G networks, which include both 5G non-standalone (5G-NSA) and 5G-SA networks.
152. In Telecom Decision 2022-102, the Commission directed the national wireless carriers to
- specify in their tariffs that wholesale roaming will be available on their next-generation radio access networks (NGRANs), which are part of the 5G networks, and include VoNR calls and data sessions;
 - make wholesale roaming on 5G-SA networks available to regional wireless carriers once 5G cores are deployed in their networks and wherever 5G-SA networks are available; and
 - notify wholesale roaming customers six months prior to the launch of a 5G-SA core network, or provide notification immediately for any 5G-SA network that has already been announced as of the date of the decision, and update their tariffs at that time to enable roaming on the 5G-SA network.

Positions of parties

153. Several interveners submitted that the national wireless carriers have not effectively incorporated access to 5G services in their proposed tariffs and that the availability of seamless roaming on 5G networks must be clarified. Eastlink requested that the Commission direct the national wireless carriers to update their proposed tariffs to ensure that wholesale roaming, including seamless roaming, are available on 5G-NSA networks.
154. Cogeco submitted that RCCI has already launched its 5G-SA network and presumed that Bell Mobility and TCI will soon do so; therefore, the Commission should direct them to provide language that more clearly states the availability of seamless roaming on both their 5G-NSA and 5G-SA networks.
155. Videotron submitted that all three national wireless carriers have deployed 5G-NSA networks, so they must clearly state that 5G/NGRAN roaming is available to regional wireless carriers. A reference to VoNR roaming, however, is not required until the national wireless carrier has deployed a 5G-SA network.
156. Additionally, Videotron submitted that while Bell Mobility included a reference to 5G/NGRAN in items 100.1(a)(7) and 100.11(a)(2), which deal with the scope of roaming services, it did not mention 5G/NGRAN in the sections of its tariff that deal with seamless hand-off. The inclusion of a reference to 5G/NGRAN in the definition of Seamless Handoff in item 100.1(a)(27) would correct this error.

157. Xplore submitted that TCI's definition of Seamless Roaming Service lacks references to VoNR calls and data sessions, and Bell Mobility's definition of Seamless Handoff lacks reference to 5G voice calls and data sessions. Eastlink submitted that Bell Mobility and TCI are attempting to limit their seamless roaming service to 4G/LTE Voice over LTE (VoLTE) calls or data sessions, contrary to the Commission's policy that its wholesale roaming framework applies to both 5G-NSA and 5G-SA networks.
158. Regarding TCI's tariff, Videotron submitted that a reference to 5G/NGRAN can be found in the definitions of Available Footprint and GSM-based Roaming Service in item 233.2, but that there is no such reference in the definition of Seamless Roaming Service. Similarly, in item 233.3.8.a.ii, which identifies the information that must be included with a seamless roaming request, reference is made solely to E-UTRAN information. Including a reference to 5G/NGRAN in the definition of Seamless Roaming Service in item 233.2 and in the list of information that is to be provided in item 233.3.8.a.ii would correct this error.
159. In relation to Bell Mobility's position on when it would file updates to its tariff following confirmation of the date on which its 5G-SA network is launched and made commercially available to its customers, Iristel submitted that Bell Mobility does not have the discretion to file updates at what it believes are the appropriate times or claim total confidentiality over the launch.

Replies

160. Bell Mobility submitted that it has incorporated 5G roaming services appropriately in its tariff, consistent with the Commission's directions. With respect to the definition of the Company Available PMN and the interconnection of PMNs, its proposed tariff contains references to its NGRAN and the GSM Association document entitled 5G Implementation Guidelines: NSA Option 3. It added that it is already working with at least one regional wireless carrier on the launch of 5G-NSA roaming.
161. Regarding 5G-SA, Bell Mobility submitted that the Commission's direction is that the further changes required to the tariff for this capability are to be made in tariff amendments filed at an appropriate time in the future. This includes references to VoNR, which is a voice service specific to 5G-SA and is therefore intended to be the subject of a future tariff amendment. Accordingly, no further changes with respect to 5G are required at this time.
162. RCCI submitted that it has not explicitly noted throughout its proposed tariff what services or technology are included in the wholesale roaming tariff; it has simply included 5G in the rate section. The body of the tariff is fluid and adaptive to technology and service changes and specifically written such that any 5G service (5G-NSA, 5G-SA, and VoNR services) are available from RCCI. It argued that explicitly noting every service and technology on offer, as requested by interveners, would make the tariff more restrictive than currently written. RCCI submitted that its tariff allows for all the types of 5G services noted by Telecom Decision 2022-102 and requested by interveners; therefore, it does not require updating.

163. TCI submitted that it has already inserted references to 5G and NGRAN in the appropriate sections of its proposed tariff. TCI added that its immediate 5G network expansion plans are for 5G-NSA deployments and that it has not yet launched 5G-SA. TCI submitted that it has included a reference to NGRAN in the definition of Available Footprint. TCI also included a reference to 5G in the Service Description of the GSM-based Roaming Service (item 233.1) and in the definition of GSM-based Roaming Service (item 233.2). Additional updates requested by Eastlink to specify that wholesale roaming is available on 5G-NSA networks are not required, nor is an update suggested by Videotron to add 5G/NGRAN to the definition of Seamless Roaming Service, because that definition already includes references to GSM-based Roaming Service and Available Footprint.

Commission's analysis

164. While Bell Mobility's definition of Seamless Handoff explicitly mentions 4G/LTE VoLTE calls or data sessions, it does not explicitly mention 5G. 5G services should be explicitly mentioned in this definition, in view of the Commission's determinations regarding 5G-NSA.

165. TCI's definition of Seamless Roaming Service indicates that it is an add-on capability of the GSM-based roaming service and that it provides a roaming end-customer with the ability to hand off VoLTE calls and data sessions from the HPMN to the VPMN. TCI specified that seamless roaming is not available for 3G technologies, but did not otherwise mention its availability on 4G and 5G technologies. However, item 233.1 indicates that the GSM-based roaming service shall also enable seamless roaming and roaming on the company's 5G networks. The Commission is of the view that, read in this context, it is implicit that seamless roaming applies to VoLTE calls and data sessions on 4G and 5G. However, TCI should state this clearly to avoid confusion and to conform to the Commission's determinations.

166. Both Bell Mobility and TCI specified in their proposed tariffs that wholesale roaming will be available on their respective NGRANs, but did not explicitly mention that this includes VoNR calls and data sessions. As discussed above, six months prior to the launch of a 5G-SA core network, a national wireless carrier is to notify its wholesale roaming service customers and update its tariff at that time to enable roaming on the 5G-SA network. At the time the Commission's decision was made, neither Bell Mobility nor TCI had launched 5G-SA core networks. To the extent that they have no plans to launch 5G-SA within the next six months, they are not required, at this time, to notify wholesale roaming customers or to amend their tariffs to include 5G-SA.

167. Item 4.4.1 of RCCI's tariff states that seamless roaming will be available for only packet switch-based LTE and higher technology generation services. It also states that seamless roaming will be implemented as an add-on capability on top of existing LTE and/or higher-technology wholesale roaming. RCCI indicated that its proposed tariff is specifically written such that any 5G service is available from the company.

The Commission is of the view that RCCI should be more specific, that is, it should state that the functionality is available on its NGRAN, and include VoNR calls and data sessions. This would ensure consistency among the tariffs of the national wireless carriers and prevent confusion.

Conclusion

168. In light of the above, the Commission **directs** Bell Mobility, in item 100.1(a)(27), and TCI, in item 233.2 (Seamless Roaming Service definition), to explicitly mention 5G services (VoLTE calls and data sessions on 5G-NSA, and VoNR and data on 5G-SA).

169. The Commission also **directs** RCCI to identify, in item 800.4.4.1, the types of 5G services that are included, namely VoLTE calls and data sessions on 5G-NSA, and VoNR calls and data session on 5G-SA.

Are the new matters raised by the national wireless carriers appropriate for inclusion in their tariffs?

170. The national wireless carriers raised certain new matters in their tariff applications:

- Costs for implementing seamless roaming and associated rates
- Limitations on large businesses, institutions, mobile virtual network operators (MVNOs), resellers, Internet of Things (IoT) communications, and machine-to-machine (M2M) communications
- Multiple monthly boundary changes

Costs for implementing seamless roaming and associated rates

Background

171. In their amended tariffs, the national wireless carriers proposed to be compensated to recover the costs of implementing and offering seamless roaming as part of wholesale roaming service. Specifically,

- Bell Mobility, in item 100.24(b), proposed (i) hourly labour rates (charges for time and materials) for all work it is required to perform with respect to a Seamless Handoff Potential Implementation Review, a Seamless Handoff Boundary Set-Up, or Seamless Handoff Boundary Changes; and (ii) costs for material, software licences, third-party services, and other direct costs it incurs.
- RCCI, in item 800.15.1.a, proposed rates for each person-hour of work as specified and agreed upon in the Feasibility and Implementation Report and for subsequent border updates. In item 800.15.1.b, RCCI indicated that the costs for equipment, material, software licences, third-party services, and any relevant costs incurred by RCCI would be charged to the customer.

- TCI, in item 233.4.2, proposed (i) labour costs for all work it performs to deliver Seamless Roaming Service, per fifteen-minute increment; and (ii) to charge the customer for the recovery of all costs for materials, software licences, third-party services, and other relevant costs TCI incurs to provision Seamless Roaming Service.

Positions of parties

172. All interveners opposed the national wireless carriers' proposals to recover new costs associated with the implementation of seamless roaming as part of the present processes. Cogeco and Iristel submitted that in Telecom Decision 2022-102, the Commission did not authorize the national wireless carriers to propose rates for the implementation of seamless roaming as part of the revised tariffs required under that decision.
173. In Videotron's view, in Telecom Regulatory Policy 2021-130, the Commission put the national wireless carriers on notice that they should be prudent in the search for incremental revenues related to seamless hand-off and that any overreach on their part could result in a comprehensive review of their existing wholesale roaming tariffs.
174. Cogeco and Iristel submitted that the Commission reminded the national wireless carriers that if they wished to propose new rates that take into account the costs to implement the functionality, they should file tariff applications with cost studies. Cogeco acknowledged that there will be some administrative effort associated with assessing applications for seamless roaming, but such a burden is not significant or unreasonable, and does not justify the open-ended application of labour charges. Iristel argued that approving their rates could give the national wireless carriers an opportunity to game the regulatory system by making the implementation of seamless roaming so expensive that it would be impossible for regional wireless carriers to implement.
175. Xplore submitted that, although not directly within the scope of the proceeding that led to Telecom Regulatory Policy 2021-130, the record of that proceeding contains significant evidence that the cost-based rates associated with wholesale roaming services are providing the national wireless carriers with far more than a fair return on their investments. The current attempt to charge additional amounts to implement seamless roaming cannot be justified. Eastlink and Xplore were of the view that the Commission should revisit the wholesale roaming rates. Eastlink was of the view that until that review is complete, the Commission should make the current rates interim and direct the national wireless carriers to remove any costs associated with the implementation of seamless roaming.
176. Videotron submitted that a new punitive unverifiable one-time charge for implementation serves no purpose other than to squelch demand. Eastlink was of the view that the national wireless carriers designed their tariffs to create significant barriers to entry in the provisioning of seamless roaming.

Replies

177. The national wireless carriers generally supported their proposal by submitting that each implementation will require different solutions that take different amounts of time. Therefore, charges based on the actual time and associated direct costs is a more efficient, appropriate, and fair solution than that of a cost study or a one-size-fits all approach.
178. Bell Mobility submitted that it is not attempting to recover all the costs of providing seamless hand-off to regional wireless carriers, but to pass on certain labour and third-party costs directly attributable to a specific carrier's request to set up or change the service. These charges are reasonable and economically efficient, and will support the successful implementation of seamless hand-off.
179. Bell Mobility also submitted that there are large fixed costs associated with establishing or changing a boundary for a seamless hand-off, and that each regional wireless carrier will have different needs. Even if compensation for these costs could simply be absorbed into a usage rate that is paid by all carriers, this would amount to subsidizing regional wireless carriers that do not invest in their networks at the expense of those that do.
180. Bell Mobility further submitted that passing on the direct costs of establishing or changing a boundary ensures that parties will make these requests only when the benefits outweigh the costs.
181. With respect to the specific rates proposed, Bell Mobility submitted that to move forward in good faith and expeditiously, it based its proposal on rates previously approved by the Commission in another context. It added that none of the interveners explained why these rates would not be appropriate in this case.
182. RCCI submitted that interveners took issue with the rates in item 15.1 of its proposed tariff despite the Commission's acknowledgement of new costs to implement seamless roaming and the direction to the national wireless carriers to "ensure that their tariffs set out the process for implementation of seamless roaming." No interveners presented evidence that implementation would not have any associated costs.
183. RCCI submitted that the Phase II costing methodology requires an assessment of the natural cost drivers of a service to determine the most appropriate method to recover costs. In the case of implementing seamless roaming, the natural cost drivers are the number of regional wireless carriers requesting the service, the areas of requested service, and the number of cell sites for each area requested, which make forecasting a major challenge. RCCI also submitted that leveraging a service implementation charge based on resources consumed is reflective of the natural cost driver for the service and consistent with the Phase II costing methodology. Both RCCI and TCI submitted that charging according to tariffed labour and construction rates is a method that the Commission has accepted in the past.

184. RCCI submitted that costs for any service are always proposed in tariff applications such that when the service is introduced, service users will be responsible for any costs incurred. To have a separate rate-setting process would disconnect the service availability date from the rate-charging date, possibly giving users free service while rates are still being determined. RCCI noted that in Telecom Decision 2022-102, the Commission explicitly stated that the national wireless carriers must “ensure that their tariffs set out the process for implementation of seamless roaming” whereby half of the implementation process involves establishing the steps required to launch the service, while the other half consists of documenting and charging the costs for providing the service.
185. With respect to interveners’ argument that there is no basis for a new charge since they believe the wholesale roaming rates to be elevated, RCCI submitted that this argument is unproven, that the charge is exclusive of the wholesale roaming rates themselves, and that the charge should be considered separately.
186. TCI submitted that the Commission acknowledged in paragraph 139 of Telecom Decision 2022-102 that there will be additional costs associated with implementing seamless roaming that were not included in the cost studies that underpin the current wholesale roaming rates. TCI noted that section 27(1) of the *Telecommunications Act* (the Act) provides that every rate shall be just and reasonable. It further noted that the Supreme Court of Canada has confirmed that “just and reasonable” is a codification of the regulatory compact and that “rates must allow the utility the opportunity to recover, over the long run, its operating and capital costs.” The national wireless carriers are mandated to implement seamless roaming and are therefore entitled to seek to recover their incremental costs of doing so.
187. TCI noted that some interveners submitted that the national wireless carriers did not give any indication of the expected costs to implement seamless roaming or that they had put no effort into assessing the costs. TCI filed evidence in the proceeding that led to Telecom Regulatory Policy 2021-130 of the cost and time it took to implement the service with one of its network-sharing partners, and the majority of this information was placed on the public record. TCI has consistently emphasized that each case is different, and that there is no one-size-fits-all solution.
188. TCI submitted that it deliberately defined a process whereby it would provide an estimate for the cost of implementation of seamless hand-off in the early stage of the process so the regional wireless carriers can make an informed decision as to whether they want to proceed. The next stage involves the creation of a statement of work, to be agreed to by both parties, to govern the work to be carried out.

Commission’s analysis

189. In Telecom Regulatory Policy 2021-130, the Commission considered that seamless roaming is not a new telecommunications service but an additional condition under which the existing mandated wholesale roaming service must be offered. It determined that a decision to mandate the provision of seamless roaming and make it

subject to cost-based rates would be an efficient and proportionate means of further implementing certain policy objectives set out in section 7 of the Act. In paragraph 411 of Telecom Regulatory Policy 2021-130, it also acknowledged the potential of additional operational costs associated with seamless roaming.

190. The Commission also indicated that if a wholesale roaming provider considers that its wholesale roaming tariffed rate no longer reflects the incremental costs it incurs to provide the service, mechanisms exist by which its concerns can be addressed. Furthermore, the Commission noted that the existing wholesale roaming tariffs were subject to a five-year cost study when they were finalized in Telecom Orders 2017-433 and 2018-99. Accordingly, the Commission determined that an assessment of the underlying costs associated with the implementation of seamless roaming and the proper reflection of these in the tariffed rates may be appropriate upon implementation of seamless roaming.
191. During the proceeding that led to Telecom Decision 2022-102, during which they made their first proposals to amend the wholesale roaming tariffs to facilitate seamless roaming and 5G roaming, RCCI and TCI included brief provisions regarding the potential for costs of seamless roaming to be charged, but did not include specific rate proposals.
192. In Telecom Decision 2022-102, the Commission noted its determinations regarding costs of seamless roaming from Telecom Regulatory Policy 2021-130, as well as RCCI's and TCI's initial proposed provisions, and reminded the national wireless carriers that any changes to their tariffed wholesale roaming rates require prior Commission approval. Telecom Decision 2022-102 did not require them to propose rates, but it did not explicitly preclude them from doing so either.
193. Following the issuance of Telecom Decision 2022-102, the national wireless carriers each proposed to charge regional wireless carriers for seamless roaming implementation, but while the national wireless carriers submitted some explanations regarding the rationale for their proposed rates, they did not submit supporting cost studies.
194. Prior to the record of these amended tariff applications closing, Cogeco, Eastlink, Videotron, and Xplore filed an [application](#) requesting that the Commission initiate an immediate and comprehensive review of the tariffed wholesale roaming rates. They expressed concern that the wholesale roaming rates are too high. The Commission has not issued its determinations on that application.
195. Under section 25 of the Act, the national wireless carriers may not provide a telecommunications service except in accordance with an approved tariff that specifies the rate or maximum or minimum rate, or both, to be charged for the service. Further, under subsection 27(1), every rate charged by a Canadian carrier for a telecommunications service shall be just and reasonable. In the Act, "rate" is defined broadly as "an amount of money or other consideration and includes zero consideration."

196. The Commission considers that by seeking Commission approval for cost-based rates for the implementation of seamless roaming, the national wireless carriers are in line with section 25 of the Act, since the seamless roaming functionality is a part of the wholesale roaming service for which a rate can be charged. Further, the proposals are in line with the determinations on rates for seamless roaming set out in Telecom Regulatory Policy 2021-130, which contemplated that cost-based rates would be appropriate for this functionality. The Commission therefore finds that the national wireless carriers are entitled to seek approval for rates for seamless roaming as an element of the mandated wholesale roaming service.
197. However, there is an absence of evidence on which the Commission can rely to conclude that the rates proposed are in fact just and reasonable under section 27 of the Act. Particularly, there is a lack of evidence of the justness and reasonableness of these cost-based rates when viewed in the context of the rates for the wholesale roaming service. There are no cost studies and no real-world evidence on the implementation of seamless roaming. The Commission acknowledges that while the national wireless carriers provided a rationale to explain the rates they proposed and that their rates are based on other approved rates or the Phase II costing manual, they have not been supported by a cost study. The Commission considers that there are risks that the rates proposed will not reflect appropriately the costs related to the implementation and maintenance of seamless roaming as a component of wholesale roaming costs.
198. The Commission considers that the evaluation of costs would be more effectively and efficiently done within the context of a broader evaluation of wholesale roaming rates.
199. The Commission acknowledges the competitors' concern that overall roaming rates are not supportable, and the national wireless carriers' concern that denying the proposed rates would delay the date they could start charging a rate for the implementation of seamless roaming, if they would be allowed to do so at all. It would also mean that the national wireless carriers would have to offer seamless roaming without potentially being able to recoup the associated costs for now, but this assumes that such a rate would eventually be permitted and that the current wholesale roaming rates could not be found to compensate for the implementation costs of seamless roaming. The Commission also notes that the definition of rates in the Act also includes the potential of zero consideration.
200. For the foregoing reasons, the Commission considers that it would not be appropriate to address the proposed rates for seamless roaming in this order. Accordingly, following this order, wholesale roaming customers will have access to seamless roaming at no incremental cost above the current tariffed rates.

Conclusion

201. In light of the above, the Commission **denies** the national wireless carriers' proposed rates for seamless roaming at this time and **directs** them to remove the rates from their tariffs.

Limitations on large businesses, institutions, MVNOs, resellers, IoT communications, and M2M communications

Background

202. Item 233.1 of TCI's proposed tariff states that "GSM-based Roaming Service on 5G shall be provided by the company to enable voice, data and text retail mobile services only, for consumers and small businesses, in accordance with the terms and conditions herein."

203. TCI's definition of Seamless Roaming Service states that the service is not offered between (i) the VPMN and (ii) the network of the reseller or MVNO customers of the wholesale roaming customer, nor is it offered between (i) the VPMN and (ii) other roaming, reseller, or MVNO partners of the wholesale roaming customer. It also indicates that GSM-based Roaming Service cannot be used to enable IoT or M2M communications.

Positions of parties

204. Iristel submitted that TCI is attempting, in item 233.1, to limit the availability of 5G roaming to consumers and small businesses. This restriction was not one of the items the Commission viewed as necessary in Telecom Decision 2022-102 to implement 5G roaming. It is anti-competitive and will only serve to hobble the ability of regional wireless carriers to compete by restricting access to markets and subjecting them to an undue administrative burden of determining who is a consumer or small business.

205. Xplore argued that this is a policy change that would narrow the group of end-users to whom access to roaming services is currently permitted by TCI's tariff language. Accordingly, this restriction should be removed from TCI's proposed tariff.

206. Videotron submitted that nowhere in Telecom Decision 2022-102 does the Commission suggest that roaming itself or 4G/5G seamless hand-off is not required for IoT or M2M applications. A goal of the worldwide development process for 5G has been to accommodate a massive expansion of IoT and M2M applications. Accordingly, to impede regional wireless carriers' ability to serve this market on a comparable basis to that of the national wireless carriers, geographically or technologically, would cut them off from one of the most innovative and fastest growing sectors of the wireless business.

207. Iristel submitted that the limitation on GSM-based roaming is anti-competitive because it prevents wholesale roaming customers from providing service to IoT and M2M devices.

208. Videotron submitted that the determinations in Telecom Regulatory Policy 2021-130 that the large business and institutional market and the IoT and M2M market constitute distinct product markets does not constrain its subsequent conclusion that the national wireless carriers together exercise market power, nor does it factor into the Commission's assessment of the need for regulatory measures at the wholesale level to discipline the exercise of that market power. Neither Bell Mobility nor RCCI proposed restrictions on IoT or M2M devices of the sort put forward by TCI.

Replies

209. TCI submitted that in Telecom Regulatory Policy 2021-130, the Commission stated that its competitive assessment was focused on "retail mobile wireless services generally available to individual Canadians and small businesses" and defined the relevant product market as "retail mobile wireless services, that is, retail mobile voice, text, and data services, offered to individuals and small businesses."

Therefore, the Commission's finding of market power was limited to the provision of retail mobile wireless services and the resulting determinations are intended to address this perceived market power. It would be contrary to the Commission's findings to require TCI to make its GSM-based Roaming Service available to medium- and large-business customers or to enable other business services through its GSM-based Roaming Service, including IoT and M2M communications. With respect to IoT and M2M communications, the Commission stated in Telecom Decision 2022-102 that it "considers that seamless roaming is not necessary for those purposes."

210. In response to an RFI regarding the limitations on IoT and M2M communications, TCI submitted that these communications are primarily business market offerings and are therefore not captured in the Commission's determinations related to seamless roaming and 5G in Telecom Regulatory Policy 2021-130.

211. However, TCI submitted that it was not seeking to exclude consumer IoT or M2M solutions from its GSM-based Roaming Service. It noted that the Commission's Communications Market Reports refer to M2M services as including "consumer electronics/connected ancillary devices" and that one example of a consumer connected ancillary device requiring roaming could be a mobile-enabled tablet that a consumer takes with them on vacation. TCI confirmed that its GSM-based Roaming Service would be available for such use in cases where the consumer device is activated on the network of a wholesale roaming customer by way of a consumer mobility plan. It therefore proposed to amend the definition of GSM-based Roaming Service in item 233.2 to reflect this.

212. Regarding the limitations for resellers and MVNO customers, TCI submitted that if a wireless carrier has its own core network but its wireless network coverage does not overlap with that of TCI, then it would be impossible for TCI to implement seamless roaming for that carrier because there is no overlapping network to hand off to for seamless roaming.

213. However, TCI could still provide incidental roaming to the wireless carrier. Seamless roaming necessitates core-to-core integration between the VPMN (in this case, TCI's network) and the HPMN (the network of the wholesale roaming customer). In a typical reseller model, the reseller uses the core infrastructure and the IMSI [international mobile subscriber identity] range provided by its host (in this case, the wholesale roaming customer). In this instance, the reseller customer of the wholesale roaming customer would be provided with the same seamless roaming functionality as the wholesale roaming customer because the reseller uses the core network of the wholesale roaming customer. To address this, TCI proposed to amend its definition of Seamless Roaming Service in item 233.2.

Commission's analysis

214. In Telecom Regulatory Policy 2015-177, the Commission determined that, as a condition of offering and providing GSM-based wholesale roaming, the national wireless carriers must provide roaming on their GSM-based mobile wireless networks to all subscribers served by their wholesale roaming partners, including the subscribers of any MVNOs operating on their wholesale roaming partners' networks. The Commission reaffirmed this determination in Telecom Decision 2017-56 and set the terms and conditions of the wholesale roaming framework following the publication of that decision.

215. As noted above, in Telecom Regulatory Policy 2021-130, the Commission considered that seamless roaming is not a new service but an additional condition under which the existing mandated wholesale roaming service must be offered. The Commission noted that seamless roaming benefits consumers by helping to prevent dropped calls and data sessions when consumers move between carriers' networks, and that it benefits competition by enabling wireless competitors to offer a higher quality of service. The Commission also directed the national wireless carriers and Saskatchewan Telecommunications (SaskTel) to make available a wholesale MVNO access service based on an assessment of market power and the attainment of the policy objectives of the Act. However, this determination is distinct from the determinations regarding seamless roaming in Telecom Regulatory Policy 2021-130.

216. TCI is the only national wireless carrier that proposed to limit its GSM-based roaming service on 5G service to consumers and small businesses, to impose limitations for its seamless roaming service on resellers or MVNO partners of the wholesale roaming customer, and to place limitations on IoT and M2M communications. The Commission considers that it did not view such limits as necessary in Telecom Decision 2022-102 for the implementation of seamless roaming. Therefore, the Commission finds that it did not request that TCI file amended tariffs related to such limitations, and that such limitations are out of scope of this proceeding.

217. The limitations proposed by TCI regarding consumers and small businesses are inconsistent with the Commission's direction mandating the provision of seamless roaming as a functionality of wholesale roaming service. Large businesses,

institutions, resellers, and all MVNO customers should be provided with the same functionality for wholesale roaming.

218. Regarding the limitations on IoT and M2M communications, while in Telecom Decision 2022-102 the Commission noted only that seamless roaming is not necessary for those applications on 2G and 3G networks, it did not reference or consider whether seamless roaming was necessary for the use of those applications on 4G and 5G networks. The Commission did not examine in depth the IoT and M2M markets at the time. The Commission's statement briefly mentioning IoT and M2M services was not a policy determination regarding the terms and conditions of the national wireless carriers' seamless roaming functionality in their tariffs but only a finding of fact regarding the 2G and 3G networks.
219. All consumers that benefit from wholesale roaming should be able to enjoy the benefits of seamless roaming. Putting limitations on certain types of consumers or applications (i.e., IoT and M2M) would prevent regional wireless carriers from offering a higher-quality, competitive service. Further, regional wireless carriers could face challenges in trying to explain to their customers the limitations proposed by TCI. In addition, limiting the provision of seamless roaming as TCI proposed could raise concerns with respect to compliance with section 27(2) of the Act. For instance, it could result in regional wireless carriers being subject to an undue or unreasonable disadvantage because they would not be able to offer the same quality of service to all their customers.
220. In light of the above, the Commission considers that requiring TCI to remove the limitations on seamless roaming availability for large businesses, institutions, resellers, MVNO customers, and IoT and M2M communications would be consistent with the policy objective set out in paragraph 7(c) of the Act.⁹

Conclusion

221. Accordingly, the Commission **directs** TCI to remove from items 233.1 and 233.2 of its proposed tariff the limitations on offering seamless roaming functionality (i) to large businesses, institutions, resellers, and MVNO customers, and (ii) in connection with IoT and M2M communications.

Multiple monthly boundary changes

Background

222. In Telecom Decision 2022-102, the Commission stated that the exchange of cell site information to update network borders is an important activity to ensure the effectiveness of seamless hand-off. However, the Commission acknowledged that there is still an administrative burden associated with the exchange of such

⁹ The cited objective of the Act is to enhance the efficiency and competitiveness, at the national and international levels, of Canadian telecommunications.

information. Accordingly, the Commission determined that regional wireless carriers are to provide updated cell site information to their wholesale roaming providers no more than once per month, in a standard format that is to be described in the wholesale roaming providers' tariffs.

Positions of parties

223. Following the submission of the proposed tariffs, some interveners raised the issue of the number of boundary changes that regional wireless carriers can ask for at one time at the frequency mentioned in the decision.
224. Videotron submitted that there is nothing in Telecom Decision 2022-102 that limits the number of individual boundary changes a regional wireless carrier can make each time the monthly submission window opens. For example, the fact that a regional wireless carrier may have a boundary change to make in the Eastern Townships region of Quebec does not prevent it from also making a boundary change in the Lac-St-Jean region of Quebec. Videotron submitted that the proposed tariffs contain ambiguous wording that could be interpreted as limiting the number of boundary changes a regional wireless carrier can make each time the monthly window opens.
225. Videotron noted that Bell Mobility's item 100.8(f)(2) states that "the Wholesale Roaming Customer shall be entitled to initiate no more than one Seamless Handoff Boundary Change in a thirty (30) day period unless otherwise agreed to by the Parties." However, Bell Mobility's definition of Seamless Handoff Boundary in item 100.1(a)(29) states that such a boundary "consists of the edge of the coverage of one or more cell sites on the Company available PMN in a single region." According to Videotron, taken together, these items appear to exclude the possibility of changing boundaries in more than one region during a single monthly change window.
226. Videotron added that, similarly, RCCI's item 800.4.4.4 states that "the Wholesale Roaming Customer shall be entitled to request no more than one monthly Seamless Roaming network border change unless otherwise agreed to by Rogers."
227. Videotron also expressed its concern that resource management problems may emerge with the regional wireless carrier if it is forced to execute all its monthly boundary changes simultaneously. It would be more efficient if the execution of monthly boundary changes could be staggered throughout the month (e.g., changes for region A being executed the first week, and changes for region B being executed the second week). There is nothing inconsistent between the establishment of a staggered execution schedule and the respect for the rule that boundary changes occur only once a month. Videotron therefore recommended that the national wireless carriers' proposed tariffs be amended to accommodate the staggered execution of monthly boundary changes.
228. Eastlink also submitted that the national wireless carriers are attempting to include language that would limit border updates to a singular border, contrary to the Commission's determination that regional wireless carriers be permitted to submit

updated network information monthly. Eastlink was concerned that this would lead to unreasonable delays in updating cell site information, and unnecessary roaming costs for regional wireless carriers as they continue to build out their networks.

Replies

229. Bell Mobility submitted that Videotron was disregarding the Commission's determinations in Telecom Decision 2022-102 by requesting a process requiring the national wireless carriers to exchange cell site information and implement updates multiple times each month with each regional wireless carrier. This would undermine the balance the Commission sought to achieve and impose an impossible administrative burden on the national wireless carriers, since they could be forced to manage multiple concurrent updates for multiple carriers in multiple regions throughout the year.
230. Bell Mobility indicated that the regional wireless carriers' evidence suggested that boundary updates would be rare; updating a boundary once a month should already more than meet the regional wireless carriers' requirements. If the Commission believes it does not, Bell Mobility submitted that its definition of Seamless Handoff Boundary Change could be amended to expand the geographic scope of the single monthly update that the wholesale roaming provider is required to undertake for each customer.
231. TCI submitted that the Commission should reject Videotron's request to have the ability to execute staggered network boundary changes by region throughout the month because it does not accord with network best practices of leveraging maintenance windows to implement network changes. It would also create an additional unnecessary administrative burden. TCI indicated that, within its company, a single team completes all wireless network boundary changes for its national network, and these individuals are all deployed during the same network maintenance window. Therefore, it is necessary to agree upon a time of the month to complete all the requests, to coincide with this maintenance window. While the customer could submit requests throughout the month, these would be compiled and treated only during the single network maintenance window available at a particular time in the month. This is necessary to properly plan and execute network changes to ensure network continuity for both TCI customers and its wholesale roaming customers.
232. Regarding Eastlink's request about the reference to a single network boundary change, TCI intended to indicate that this type of change request consists only of boundary location changes and does not constitute other technology or operational changes. TCI anticipated completing more than one boundary location change request at the same time, during its regular monthly maintenance window. For

greater clarity, TCI proposed revising item 233.3.8.e.iii as follows (deletions are shown as struck out and additions are shown in bold italics):¹⁰

For a ~~single~~ **simple** network boundary ~~change~~ **changes**, it is anticipated that some of the information originally provided as part of the original seamless roaming request could be re-used and re-submitted.

Commission's analysis

233. In Telecom Decision 2022-102, the Commission was of the view that daily cell site information updates would place an undue administrative burden on the national wireless carriers, particularly if they received these updates from numerous regional wireless carriers. The Commission considers that monthly boundary changes staggered throughout the month would be akin to providing daily information updates. Accordingly, the national wireless carriers' tariffs should not be amended to include wording to accommodate the staggered execution of monthly boundary changes. However, as mentioned in Telecom Decision 2022-102, wireless carriers can negotiate to share information more or less frequently.
234. Eastlink and Videotron raised concerns that regional wireless carriers would be limited in the number of discrete boundary changes they can make each time the monthly window opens. In Telecom Decision 2022-102, the Commission stated that regional wireless carriers have an incentive to expand their networks so as to minimize wholesale roaming charges and that timely border updates are needed to capture the changes resulting from such expansions. While the frequency of the exchange of information should be limited so as to not place an undue administrative burden on the national wireless carriers, the exchange of information should not be limited to only one border, boundary, or region.
235. The policy objective set out in paragraph 7(a) of the Act is to facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich, and strengthen the social and economic fabric of Canada and its regions. As the Commission recognized in Telecom Decision 2022-102, the exchange of cell site information to update network borders is an important activity to ensure the effectiveness of seamless roaming. Accordingly, to facilitate the orderly development of the telecommunications system, regional wireless carriers should be allowed to exchange the most up-to-date information about their borders every time the monthly window opens.
236. Bell Mobility indicated that it could expand the geographical scope of its Seamless Handoff Boundary Change, and TCI proposed a modification to indicate that TCI anticipates completing more than one boundary location change request at the same time, during its regular monthly maintenance window. The Commission considers that these changes would address some of the concerns expressed by parties.

¹⁰ Subsequently, TCI proposed other changes to the tariff and this sentence was moved to another item.

Conclusion

237. In light of the above, the Commission **denies** Videotron's request that the national wireless carriers' proposed tariffs be amended to include the staggered execution of monthly boundary changes. However, Videotron and other regional wireless carriers can still negotiate different timelines with the national wireless carriers if required.

238. Also, the Commission **directs**

- Bell Mobility to implement the changes it proposed in item 100.1.(a)(31) [definition of Seamless Handoff Boundary Change]; and
- TCI to implement the changes shown in paragraph 232 of this order regarding boundary changes.

239. The Commission further **directs** the national wireless carriers to amend their proposed tariffs to allow for multiple boundary changes every time the monthly window opens.

Conclusion

240. In light of all the above, the Commission **approves, with changes**, the national wireless carriers' wholesale roaming tariffs that take into account seamless roaming and 5G networks.

241. The Commission **directs** the national wireless carriers to issue final tariff pages reflecting the changes indicated in this order and appendices 1 and 2 by **[19 June 2023]**.¹¹

242. The Commission further **directs** RCCI to file, for approval, proposed tariff pages regarding the terms and conditions for the offering of direct interconnection by **27 June 2023**.

243. The Commission also reminds Bell Mobility and TCI that they must file, for approval, proposed tariff pages for the offering of direct interconnection when they notify regional wireless carriers of the launch of a 5G-SA core network.

244. In addition, the Commission clarifies the following:

- The Commission's intention was for seamless roaming to compensate for a weak signal inside buildings, stadiums, and other venues; otherwise, consumers would not fully benefit from the seamless roaming functionality.

¹¹ Revised tariff pages can be submitted to the Commission without a description page or a request for approval; a tariff application is not required.

- With regard to the exchange of cell site information:
 - (i) The regional wireless carrier requests information about the national wireless carrier's cell site(s) from the national wireless carrier.
 - (ii) In response, the national wireless carrier provides the information to the regional wireless carrier within seven days.
 - These two steps can be performed at any time and there is no limit on the number of times the regional wireless carrier can make these information requests.
 - (iii) The regional wireless carrier provides the national wireless carrier with the regional wireless carrier's updated cell site information to request boundary changes.
 - The regional wireless carrier is to provide its updated cell site information to the national wireless carrier not more than once per month, and the information must be provided in the standard format described in the national wireless carrier's tariff.
 - (iv) In response, the national wireless carrier has 30 days to implement the necessary adjustments to its network.

245. Finally, the Commission determines that it is unable to evaluate at this time whether seamless roaming implementation should be addressed in separate charges or be recovered as part of wholesale roaming rates, and whether the proposed rates are just and reasonable.

Other issue

246. RCCI's Tariff Notice 72C for seamless roaming and 5G roaming is the same as its tariff application to implement the mandated MVNO access service. The proceedings in respect of the MVNO access service are separate from the revisions to the wholesale roaming tariffs. The issues regarding the MVNO access service have been dealt with separately in Telecom Order 2023-133.

Secretary General

Related documents

- *Wholesale mobile network operator (MVNO) access tariffs – Amended terms and conditions*, Telecom Order CRTC 2023-133, 9 May 2023
- *Update to national wireless carriers' GSM-based wholesale mobile wireless roaming tariffs to incorporate seamless hand-off and 5G roaming*, Telecom Decision CRTC 2022-102, 6 April 2022

- *Review of mobile wireless services*, Telecom Regulatory Policy CRTC 2021-130, 15 April 2021
- *Wholesale mobile wireless roaming service tariffs – Final rates*, Telecom Order CRTC 2018-99, 22 March 2018
- *Follow-up to Telecom Decision 2017-56: Wholesale mobile wireless roaming service tariffs – Final terms and conditions*, Telecom Order CRTC 2017-433, 6 December 2017
- *Wholesale mobile wireless roaming service tariffs – Final terms and conditions*, Telecom Decision CRTC 2017-56, 1 March 2017
- *Regulatory framework for wholesale mobile wireless services*, Telecom Regulatory Policy CRTC 2015-177, 5 May 2015

Appendix 1 to Telecom Order CRTC 2023-171

Changes to the national wireless carriers' proposed final terms and conditions for seamless roaming and 5G roaming

Specific prescribed text and elements to be added to the national wireless carriers' tariffs is shown in bold italics, and text to be deleted is shown as struck out.

Bell Mobility

Item 100.1(a):

(19) “In-footprint Coverage Gap Boundary” means the perimeter ~~of a material geographic area~~ within the HPMN coverage area identified by the Wholesale Roaming Customer as an in-footprint coverage gap, as shown on a coverage map provided by the Wholesale Roaming Customer to the Company and as agreed to by the Parties, where that perimeter falls within the Company Available PMN.

(27) “Seamless Handoff” means the provision of wireless network functionalities for seamless handoff as expressly contemplated under this tariff item. For greater certainty, the seamless handoff provided under this tariff item and prescribed by the CRTC enables an End-user to continue a 4G/LTE VoLTE **or a 5G (VoLTE and data on 5G-NSA and VoNR & data on 5G-SA)** voice call or data session initiated on the Home Network without, where possible, dropping the call or data session when moving across a Seamless Handoff Boundary from the Home Network to Roaming on the Company Available PMN.

Item 100.9:

9. Charging, Billing and Accounting

(a) Roaming Rates ~~and Seamless Handoff Fees~~

(1) The Wholesale Roaming Customer is responsible for payment to the Company of charges for all Services furnished.

Item 100.18(a)(1):

A Wholesale Roaming Customer that may wish to implement Seamless Handoff in connection with Roaming on the Company Available PMN or to undertake a new Seamless Handoff Boundary Set-Up may request a Seamless Handoff Potential Implementation Review by providing to the Company a written request (***the Seamless Handoff request***), in the form prescribed by the Company, identifying the areas in which the Wholesale Roaming Customer may wish to implement Seamless Handoff and all relevant information required by the Company to assess the feasibility of and potential technical approaches to implementing Seamless Handoff. ***The timeline for the Feasibility and Implementation Process of Seamless Handoff (item 100.18) starts when the Company receives that Seamless Handoff request.***

Item 100.18(a)(5):

To be deleted

Item 100.24(b):

To be deleted

RCCI

Item 800.1.21:

“Seamless Roaming” shall mean the uninterrupted transition between the Wholesale Roaming Customer’s PMN and the Rogers’ PMN (excluding 2G and 3G services). This involves handing off voice calls and data sessions from the Wholesale Roaming Customer’s PMN to the Rogers’ PMN without interruption in service. Seamless roaming will also be available for coverage gaps, *which shall be identified by the Wholesale Roaming Customer*, in Wholesale Roaming Customer Footprint.

Item 800.4.3:

Network Interconnection

GSM-based Roaming Services shall be provided by way of indirect interconnection via a third-party signaling hub provider. An indirect interconnection enables Wholesale Roaming Customer’s End Users to use voice, SMS messaging, and data services while they are Roaming on Rogers’ PMN, subject to the rest of the conditions in this Tariff, and consistent with GSM Association Permanent Reference Documents, to provide

- a. Signaling System 7 (SS7) and diameter signaling for End-user authentication, Services available to the End User while Roaming, transit for SMS messaging back to the Home Network, and termination of incoming calls;
- b. General Packet Radio Service (GPRS) Roaming exchange (GRX) to allow the Visited Network to pass Internet traffic back to the Home Network; and
- c. Data clearing house to allow the Home Network to receive call detail records from the Visited Network.

A direct interconnection may be requested by the Wholesale Roaming Customer. The configuration of this interconnection will ~~solely be determined by Rogers~~ *be mutually agreed upon by Rogers and the Wholesale Roaming Customer* and *is can be* subject to commercial agreement outside the confines of this tariff.

Item 800.4.4.1:

Seamless Roaming will be available for only packet switch based (MMTel, MBB) LTE and higher technology generation services (***VoLTE & data on 5G-NSA and VoNR & data on 5G-SA***). This service is offered only as one-way inter-PLMN handover from Wholesale Roaming Customer PMN to Rogers' PMN. Inter-PLMN handover from Rogers PMN back to Wholesale Roaming Customer PMN will not be supported, instead this PLMN change will be under the control of Wholesale Roaming Customer device as part of network reselection in idle state. Seamless roaming will be implemented as an add on capability on top of existing LTE and / or higher technology wholesale roaming (***VoLTE & data on 5G-NSA and VoNR & data on 5G-SA***).

Item 800.4.4.4:

After the initial set-up activities for Seamless Roaming, the Wholesale Roaming Customer shall be entitled to request ~~no more than one monthly~~ Seamless Roaming network border changes ***not more than once per month***, unless otherwise agreed to by Rogers. These network border changes must also be proposed in accordance with Article 5.2.3.

4.5 Seamless Roaming Feasibility and Implementation Process

4.5.1 A Wholesale Roaming Customer that wishes to implement or update coverage for Seamless Roaming in connection with Roaming on the Available Rogers Footprint may request a Seamless Roaming Potential Implementation Review by providing to Rogers a written request, in the form prescribed by Rogers, identifying the areas in which the Wholesale Roaming Customer may wish to implement or update coverage for Seamless Roaming and all relevant information required by Rogers to assess the feasibility of and potential technical approaches to implementing Seamless Roaming. ***The Wholesale Roaming Customer must clearly specify: the province; latitude and longitude of cell site location; E-UTRAN Cell Identifier ("ECI"); TAC list and map; and neighbor frequencies to be added to Enhanced NodeB's ("eNodeB's") for each cell site in the following:***

- i. the portion of the border along which the Seamless Roaming Service is requested, and if applicable, the border along which the Seamless Roaming Service is requested;***
- ii. the Wholesale Roaming Customer neighbour cell sites for (1) the portion of the border along which Seamless Roaming Service is requested and (2) the border along which the Seamless Roaming Service is requested, if applicable; and***
- iii. the proposed Rogers cell sites where the Wholesale Roaming Customer requests a seamless handoff.***

The information requested for items (i) through (iii) above must be provided in both a spreadsheet and a GIS file in MapInfo format, or such other format as specified by Rogers. The Wholesale Roaming Customer must also provide a list of all vendors for the Wholesale Customer's RAN and core network, along with a general description of the type of equipment provided by each vendor. Such information is to be provided in a spreadsheet. Rogers will work in good faith to make the service operational within 90 days of receipt of the request or a timeline mutually agreed upon by both Parties.

- a. To complete its review, Rogers may request additional information from the Wholesale Roaming Customer as required
- b. Upon completion of its review, Rogers will advise the Wholesale Roaming Customer whether implementation of Seamless Roaming is feasible given the information provided by the Wholesale Roaming Customer and, if it is, how Rogers can implement Seamless Roaming with the Wholesale Roaming Customer. ~~If Rogers determines that Seamless Roaming is not feasible with the current technology of the Wholesale Roaming Customer, Rogers will assist Wholesale Roaming Customer to identify what solutions may be possible.~~ ***Should a technical impediment to deploying Seamless Roaming be discovered, Rogers will not unilaterally deny the provision of the service. Instead, both the Wholesale Roaming Customer and Rogers will work in good faith in order to resolve the issues. If an issue or dispute between the Wholesale Roaming Customer and Rogers regarding an impediment to the deployment of Seamless Roaming cannot be resolved, the Wholesale Roaming Customer and Rogers may seek to resolve the relevant issue using other means, including the CRTC's staff-assisted dispute resolution mechanisms.***

Item 800.4.5.3(b):

Following receipt of a Seamless Roaming Set-Up request the Parties will agree on a statement of work reflecting what each Party will do to implement the request and the associated resources and charges in accordance with Article 15.1. ~~Service may be operational within 90 days of receipt of the request or a timeline mutually agreed upon by both Parties.~~

Items 800.15.1(a) and 800.15.1(b):

To be deleted

TCI

Item 233.1:

This service provides GSM-based wholesale roaming to mobile wireless carriers, other than Bell Mobility and Rogers Communications Canada Inc. and their respective affiliates, successors or assigns, that are licensees of one or more commercial mobile wireless spectrum licenses under the licensing framework established by Innovation, Science and Economic Development Canada. GSM-based wholesale roaming is provided in accordance with the terms and conditions established by the CRTC in Telecom Regulatory Policy CRTC 2015-177, as well as in Telecom Decision CRTC 2017-56 and Telecom Order CRTC 2017- 433. This GSM-based Roaming Service allows retail end-customers of Canadian mobile wireless carriers to originate or terminate communications by roaming on the Company’s wireless network based on the Commission’s requirements set out in Telecom Regulatory Policy CRTC 2015-177.

Pursuant to paragraphs 410 and 421 of Telecom Regulatory Policy CRTC 2021-130 (“TRP 2021-130”), GSM-based Roaming Service shall also enable seamless roaming and roaming on the Company’s 5G networks. GSM-based Roaming Service on 5G shall be provided by the Company to enable voice, data and text retail mobile services only, ~~for consumers and small businesses,~~ in accordance with the terms and conditions herein. The Company ~~may~~ **shall** make available Seamless Roaming Service as an add-on capability of the GSM-based Roaming Service upon the Wholesale Roaming Customer’s request pursuant to the terms contained herein. Because the Commission has forborne, in Telecom Decision 2017-56, with respect to the regulation of this service as set out in that decision, the Company may also provide the service in this tariff at rates and on terms different from the tariffed rates and terms pursuant to an agreement entered into between the Company and a Wholesale Roaming Customer.

Because the Commission has forborne, in Telecom Decision 2017-56, with respect to the regulation of this service as set out in that decision, the Company may also provide the service in this tariff at rates and on terms different from the tariffed rates and terms pursuant to an agreement entered into between the Company and a Wholesale Roaming Customer.

Item 233.2:

“GSM-based Roaming Service” enables the retail customers of a wireless carrier (the home network carrier) to automatically access voice, text, and data services by using a visited wireless carrier’s network (also referred to as “the host network”), including the radio access network (RAN), using GSM-based technologies. 5G roaming shall be implemented pursuant to section 2.12 of the GSMA 5G Implementation Guidelines: NSA Option 3, dated February 2020. ~~For greater certainty, GSM-based Roaming Service cannot be used to enable Internet of Things or Machine-to-Machine communications, other than by individuals and small businesses who have activated a mobile device on a consumer or small business mobility plan.~~

“Home Network Inner Boundary” means the area within the HPMN, as shown on a coverage map and as agreed to by the Parties, as delineated by a ~~contiguous~~ boundary of Wholesale Roaming Customer cell sites, and within which the Wholesale Roaming

Customer has *informed the Company that the Wholesale Roaming Customer has a coverage gap* ~~no verifiable wireless network coverage (i.e. a network “coverage gap” as referred to in paragraph 44 of Telecom Decision CRTC 2022-102)~~, where the Wholesale Roaming Customer will request Seamless Roaming Service along the outer boundary of such area, pursuant to Item 233.3.8 and subject to Items 233.3.15 and 233.3.16. The Home Network Inner Boundary must be within the Available Footprint.

“Roaming End-Customer” shall mean a Person

- a. with a valid subscription for roaming use issued by a Wholesale Roaming Customer ~~but does not include subscribers of other Canadian or international mobile wireless carriers that are roaming on the Wholesale Roaming Customer's network;~~ and
- b. who is using the supported technology utilizing a GSM SIM (Subscriber Identity Module) and/or a GSM USIM (Universal Subscriber Identity Module) to enable that Person to access the mobile telecommunications service(s) of the VPMN Operator, for roaming in the Available Footprint of VPMN Operator, provided such person or entity is served by the Wholesale Roaming Customer that has not acquired spectrum or has acquired spectrum and is yet to build towers to provide coverage to its own customers.

“Seamless Roaming Service” is an add-on capability of the GSM-based Roaming Service. It provides a Roaming End-Customer with the ability to hand off VoLTE *and VoNR* calls and data sessions from the HPMN to the VPMN. Seamless Roaming Service is not available for 3G technologies, *it is available for 4G and 5G technologies (VoLTE & data on 5G-NSA and VoNR & data on 5G-SA)*. Seamless Roaming Service will be made available where the Home Network Outer Boundary meets a geographic area within the Available Footprint, and also along a Home Network Inner Boundary as agreed to by the Parties, subject to Items 233.3.15 and 233.3.16. ~~For greater certainty, the Seamless Roaming Service is not offered as between (i) the VPMN and (ii) the network of the reseller or MVNO customers of the Wholesale Roaming Customer, nor is it offered as between (i) the VPMN and (ii) other roaming, reseller or MVNO partners of the Wholesale Roaming Customer.~~ The Wholesale Roaming Customer must subscribe to the GSM-based Roaming Service and request Seamless Roaming Service pursuant to the process contained herein in order to be eligible to obtain the Seamless Roaming Service. Seamless Roaming Service will be enabled by an Evolved Packet Core (EPC) to EPC interconnection and integration between the VPMN and HPMN, facilitating packet switch data and VoLTE session handovers, with no IP Multimedia Subsystem (IMS) to IMS peering. ~~For greater certainty, no EPC to EPC interconnection is provided as between (i) the VPMN and (ii) the networks of the Wholesale Roaming Customer's roaming, reseller or MVNO customers.~~

Item 233.3.8:

Item 233.3.8 is to be replaced in its entirety with the following text, which takes into account the changes proposed by TCI during the proceeding and changes approved by the Commission in this order, as well as minor editorial changes:

Seamless Roaming Service is available to be ordered as of April 6, 2022. The submission of a Seamless Roaming Request by the Wholesale Roaming Customer (as described below) will initiate the timeline of the seamless roaming project. The seamless roaming project will be comprised of several phases: (i) High Level Implementation Assessment; (ii) Drafting and Finalization of Statement of Work (“SoW”); and (iii) Detailed Solution Design, Testing, and Implementation. Each Party will be required to participate in each phase of the project and the level of effort and materials required by the Company to complete each phase of the project is provided subject to Item 233.4.2.

a. Seamless Roaming Request:

- i. A Wholesale Roaming Customer that wishes to add Seamless Roaming Service to its existing Roaming Service must make a written request to the Company’s relevant Carrier Relations prime to add the Seamless Roaming Service. Prior to making the written request as detailed below, the Wholesale Roaming Customer may request necessary network border site information from TELUS specific to the locations for which it will seek the Seamless Roaming Service from TELUS. Such site information request must be made in writing to the applicable Carrier Relations prime at the Company. The Company shall provide the network border site information to the Wholesale Roaming Customer within seven (7) days of receiving such request.
- ii. In this request, the Wholesale Roaming Customer must clearly specify: 1) the province; 2) latitude and longitude of cell site location; 3) E-UTRAN Cell Identifier (“ECI”); 4) TAC list and map; and 5) neighbour frequencies to be added to Enhanced NodeB’s (“eNodeB’s”) for each cell site in the following:
 - A. the portion of the Home Network Outer Boundary along which the Seamless Roaming Service is requested, and if applicable, the Home Network Inner Boundary along which the Seamless Roaming Service is requested;
 - B. the Wholesale Roaming Customer neighbour cell sites for (1) the portion of the Home Network Outer Boundary along which Seamless Roaming Service is requested and (2) the Home Network Inner Boundary along which the Seamless Roaming Service is requested, if applicable; and
 - C. the proposed Company cell sites where the Wholesale Roaming Customer requests a seamless handoff.
- iii. The information requested for items (ii)(A) through (C) above must be provided in both a spreadsheet and a GIS file in MapInfo format, or such other format as specified by the Company.
- iv. In this request, the Wholesale Roaming Customer must also provide a list of all vendors for the Wholesale Customer’s RAN and core network, along with a

general description of the type of equipment provided by each vendor. Such information is to be provided in a spreadsheet.

- v. The Company will review the information received and may seek additional information from the Wholesale Roaming Customer as required to conduct a seamless roaming high level implementation assessment.
- b. High Level Implementation Assessment:
- i. Once the Company has received the required information in the specified format, the Company will work with the Wholesale Roaming Customer to perform a high level implementation assessment of the seamless roaming request. (Note: The Company and the Wholesale Roaming Customer will discuss and agree upon the specific regions from the request that are out of scope for the implementation activity.)
 - ii. As part of the high level implementation assessment, the Company will provide an initial estimate of the effort (labour) required to complete the seamless roaming implementation for the specific portions of the Wholesale Roaming Customer's network boundaries that are mutually agreed to be in scope. The initial estimate is a non-binding high level estimate, meant to be used to determine whether Parties wish to proceed with the creation of a SoW.
- c. Drafting and Finalization of SoW:
- i. The Wholesale Roaming Customer and the Company will work together to agree on a SoW reflecting what each Party will do to implement the Seamless Roaming Service, including roles and responsibilities of each Party set out in a Responsible, Accountable, Consulted, Informed ("RACI") chart with accompanying descriptions and scope. It is expected that each Party will be responsible to perform its own detailed solution design, testing and implementation of the solution and that the Wholesale Roaming Customer will need to carry out numerous activities for the project, including but not limited to RAN drive test and data fill validation.
 - ii. The Wholesale Roaming Customer and the Company will sign the SoW to indicate alignment between the Parties prior to commencement of any implementation activities.
 - iii. Without limiting the Company's right to make changes pursuant to Items 233.3.6, 233.3.7 and 233.3.9, the Wholesale Roaming Customer acknowledges and agrees that the SoW may need to be updated and amended as part of the detailed solution, design, testing and implementation phase.
- d. Detailed Solution Design, Testing, and Implementation:

- i. Following the signing of the SoW, each Party will develop a detailed solution design to enable the Seamless Roaming Service in their respective networks.
 - ii. The Company may seek additional information from the Wholesale Roaming Customer as required to complete this phase of the project.
 - iii. Activities at this stage include but are not limited to: design documentation, validation and sign-offs; test documentation, validation and sign-offs; system assessments (billing, security, interoperability, etc.); vendor consulting; system and environment set-up (DNS, OSS, etc.); testing (lab, field testing in a single cluster, monitoring of test cluster); production data fills and drive test validation (core, RAN); enablement across in-scope sites; and service assurance. Certain of these activities will be performed by one or both Parties.
 - iv. Implementation of the Seamless Roaming Service will be completed in a manner mutually agreed to by the Company and the Wholesale Roaming Customer in the SoW, without limiting the Company's right to make changes pursuant to Items 233.3.6, 233.3.7 and 233.3.9 of this Tariff.
- e. Subsequent changes:
- i. After the SoW is signed, should the Wholesale Roaming Customer subsequently (i) change or update its underlying wireless technology (including but not limited to software, hardware updates), any of its wireless technology vendor(s), and/or (ii) seek to implement any other technology or operational changes which impact the operation of the Seamless Roaming Service, then the process outlined in the preceding sections (a) through (d) must be followed.
 - ii. Network boundary changes to the Home Network Outer Boundary and the Home Network Inner Boundary are subject to Item 233.3.8.f, "Seamless Roaming Boundary Change Process".
 - iii. Updates to cell site information are subject to Item 233.3.8.g "Wholesale Roaming Customer Updated Cell Site Information Change Process".
 - iv. The Wholesale Roaming Customer shall provide at least thirty (30) days written notice to the Company that the Wholesale Roaming Customer intends to cease supporting seamless handoff at particular cell sites located along the Home Network Outer Boundary or the Home Network Inner Boundary, and the Company shall be entitled to cease supporting the Seamless Roaming Service for such sites as of the date notified by the Wholesale Roaming Customer.
- f. Seamless Roaming Boundary Change Process:
- i. Following the implementation of the Seamless Roaming Service, the Wholesale Roaming Customer shall be entitled to initiate no more than one Seamless

- Boundary Change in a thirty (30) day period unless otherwise agreed to by the Parties.
- ii. A Wholesale Roaming Customer may initiate a Seamless Roaming Boundary Change by providing a written request to the applicable Carrier Relations prime at the Company. The written request shall contain the following in respect of the Wholesale Roaming Customer's cell sites that either (1) will no longer be part of the Wholesale Roaming Customer's existing Home Network Outer Boundary and/or Home Network Inner Boundary, or (2) are intended to comprise part of the of the Wholesale Roaming Customer's Home Network Outer Boundary and/or Home Network Inner Boundary following the Seamless Roaming Network Boundary Change:
 - A. the information set out in Item 233.3.8.a.ii in the format set out in Item 233.3.8.a.iii, (for a single network boundary change, it is anticipated that some of the information originally provided as part of the original seamless roaming request could be re-used and re-submitted with any changes to relevant cell site information clearly indicated);
 - B. the date on which the Wholesale Roaming Customer will implement the relevant change(s) to the HPMN;
 - C. a summary of any relevant changes made to the Wholesale Roaming Customer's network since the last change to the Wholesale Roaming Customer's Home Network Outer Boundary and/or Home Network Inner Boundary (as the case may be) that could impact the provision of Seamless Roaming.
 - iii. Upon receipt of a written request, the Company shall, without undue delay, review the information provided by the Wholesale Roaming Customer for completeness and provide the Wholesale Roaming Customer with either a confirmation that the Company has received the complete information required to provide its response or with a request for omitted information.
 - iv. Within seven (7) days of confirming the receipt of complete information, or such longer period as may be agreed to by the Parties, the Company shall provide the Wholesale Roaming Customer with a response containing relevant information regarding the Company's cell sites that correspond to the Seamless Handoff Boundary Change.
 - v. Based on the information exchanged, the Parties shall work together in good faith to agree on a SoW reflecting what each Party will do to implement the Seamless Roaming Boundary Change.
 - vi. The Company shall undertake commercially reasonable efforts to make the necessary adjustments to the implementation of the relevant Seamless Roaming

Boundary on its network within thirty (30) days of confirming the receipt of complete information or such later date as agreed upon by the Parties, subject to any unforeseen technical issues that may arise prior to completion or any delays caused by the Wholesale Roaming Customer.

- g. Wholesale Roaming Customer Updated Cell Site Information Change Process
- i. Following the implementation of the Seamless Roaming Service, the Wholesale Roaming Customer may provide updated relevant cell site information as required for the Seamless Roaming Service, but no more than once every thirty (30) days unless otherwise agreed to by the Parties.
 - ii. The Wholesale Roaming Customer shall provide its updated cell site information to the applicable Carrier Relations prime at the Company, including the following information as applicable (this package of information is referred to as the “Cell Site Information Change Request”):
 - A. The proposed cell site information changes, including the following as applicable for each cell site for which a change is requested: 1) the province; 2) latitude and longitude of cell site location; 3) E-UTRAN Cell Identifier (“ECI”); 4) TAC list and map; and 5) other relevant parameters;
 - B. The required cell site information must be provided in both a spreadsheet and a GIS file in MapInfo format, or such other format as specified by the Company, with all cell site changes clearly indicated; and
 - C. The date on which the Wholesale Roaming Customer will implement the proposed cell site changes.
 - iii. Upon receipt of a Cell Site Information Change Request, the Company shall, without undue delay, review the information provided by the Wholesale Roaming Customer for completeness and provide the Wholesale Roaming Customer with either a confirmation that the Company has received the complete information required to provide its response or with a request for omitted information.
 - iv. If the Cell Site Information Change Request contains the required information, then the Company will determine whether such request necessitates a change on the TELUS network, and the Company will advise the Wholesale Roaming Customer whether such change must occur within a TELUS maintenance window. TELUS will make commercially reasonable efforts to provide the Wholesale Roaming Customer with an estimate within seven (7) business days of confirming receipt of complete information within the Cell Site Information Change Request, of the likely timeframe in which it will complete the associated adjustments required on the TELUS network.
 - v. The Company shall undertake commercially reasonable efforts to make the necessary adjustments on its network associated with the Cell Site Information

Change Request within thirty (30) days of confirming the receipt of complete information or such other date as agreed upon by the Parties, subject to any unforeseen technical issues that may arise prior to completion or any delays caused by the Wholesale Roaming Customer.

- vi. Following the completion by TELUS of a Cell Site Information Change Request, the Wholesale Roaming Customer shall be responsible for testing the resulting functionality of the Seamless Roaming Service at its impacted cell site locations, as required.

- h. Resolving Impediments to providing the Seamless Roaming Service:
 - i. The Company will advise the Wholesale Roaming Customer whether implementation of the Seamless Roaming Service (or changes to the Seamless Roaming Service, as the case may be, such as a Seamless Roaming Boundary Change), is feasible, given the information provided by the Wholesale Roaming Customer. If it is determined that it is not feasible to implement the Seamless Roaming Service (or the requested changes to the Seamless Roaming Service, as the case may be), the Company will advise the Wholesale Roaming Customer of the basis for its determination, the Parties will work together in good faith to identify how any impediments to implementing the Seamless Roaming Service (or the requested changes to the Seamless Roaming Service, as the case may be), can be resolved in accordance with the terms of this Tariff. If a dispute between the Parties regarding the feasibility of implementing seamless roaming (or the requested changes to the Seamless Roaming Service, as the case may be), cannot be resolved, the Parties may seek to resolve the relevant issue using other means, including the CRTC's staff-assisted dispute resolution mechanisms.

Item 233.4.2:

To be deleted

Appendix 2 to Telecom Order 2023-171

Directions regarding other changes to the national wireless carriers' proposed final terms and conditions for seamless roaming and 5G roaming

If no tariff item number is specified in the determinations in this Appendix, the national wireless carrier must identify the appropriate placement in the final tariff pages for the necessary change.

Bell Mobility

Bell Mobility is to amend its tariff, in a manner consistent with the Commission's determinations in this order, to reflect the following:

- Modify the definition of Seamless Handoff Boundary Change in item 100.1(a)(31) so as to (i) expand the geographic scope of the single monthly update, and (ii) allow multiple boundary changes that the Wholesale Roaming Customer can request no more than monthly.
- Indicate that a regional wireless carrier can request, from a national wireless carrier, the national wireless carrier's up-to-date cell site information at any time (i.e., not only within the context of a boundary change request), and that the national wireless carrier must provide this information within seven days.
- Multiple boundary changes must be allowed every time the monthly window opens.

RCCI

RCCI is to amend its tariff, in a manner consistent with the Commission's determinations in this order, to reflect the following:

- A regional wireless carrier can request, from a national wireless carrier, the national wireless carrier's up-to-date cell site information at any time (i.e., not only within the context of a boundary change request), and the national wireless carrier must provide this information within seven days.
- Multiple boundary changes must be allowed every time the monthly window opens.
- Separate the process for seamless roaming implementation from the process for a boundary change. Specifically, RCCI is to reflect the wording set out in Appendix 1 above for TCI's item 233.3.8 and make the necessary associated changes, such as adding definitions.

TCI

TCI is to amend its tariff, in a manner consistent with the Commission's determinations in this order, to reflect the following:

- TCI is to modify, like Bell Mobility, its definition of Seamless Handoff Boundary Change in item 233.2 so as to expand the geographic scope of the single monthly update and allow multiple boundary changes that the Wholesale Roaming Customer can request not more than once per month.
- Multiple boundary changes must be allowed every time the monthly window opens.
- A regional wireless carrier can request a national wireless carrier's up-to-date cell site information at any time (i.e., not only within the context of a boundary change request), and the national wireless carrier must provide this information within seven days.