Canadian Radio-television and Telecommunications Commission
Conseil de la radiodiffusion et des télécommunications canadiennes

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References: 2021-404 and 2021-404-1

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Modification of the next-generation 9-1-1 framework to accommodate hosted call handling solutions for public safety answering points

Summary

The Commission issues a number of determinations related to the permissibility of hosted call handling solutions (CHS) for public safety answering points (PSAPs) in the context of next-generation 9-1-1 (NG9-1-1).

Specifically, the Commission determines that 9-1-1 governing authorities can designate demarcation points at hosted CHS sites in the NG9-1-1 networks.

Additionally, the Commission sets out a number of determinations with respect to the conditions to be imposed on non-PSAP demarcation points interconnecting with the NG9-1-1 networks, and modifies several Commission-established definitions to reflect the permissibility of hosted CHS in the NG9-1-1 framework.

Further, the Commission imposes certain conditions on NG9-1-1 network providers with respect to monitoring and reporting.

Finally, the Commission **determines** that it is currently premature to address the potential interactions between the NG9-1-1 network, hosted CHS, and the new three-digit abbreviated dialing code for mental health crisis and suicide prevention services.

Background

Next-generation 9-1-1 framework

1. In Telecom Regulatory Policy 2017-182, the Commission imposed various obligations on the telecommunications industry in relation to the transition from Basic 9-1-1 and Enhanced 9-1-1 (E9-1-1) to next-generation 9-1-1 (NG9-1-1), and established various definitions in relation to the boundaries of the NG9-1-1 network. The Commission determined that incumbent local exchange carriers (ILECs) would be responsible for building, operating, and maintaining the NG9-1-1 networks, the costs of which would form the basis of the NG9-1-1 tariffs.

Part 1 application from the New Brunswick 9-1-1 Bureau

2. The Commission received an application from the New Brunswick 9-1-1 Bureau (NB9-1-1)[1], dated 3 June 2021, in which they requested that the Commission clarify the policy established for the delivery of NG9-1-1 calls by ILECs. Specifically, the NB9-1-1 sought clarification on whether ILECs may connect their NG9-1-1 networks to demarcation points determined by the relevant 9-1-1 governing authorities, and whether or not these demarcation points must be located at public safety answering point (PSAP) premises. NB9-1-1 also indicated its intent to adopt a hosted model for call handling solutions (CHS) for its PSAPs, which would require NG9-1-1 traffic to be delivered to two data centres where the CHS would be housed, as opposed to delivering NG9-1-1 traffic directly to its eight provincial PSAPs.[2] Further, the NB9-1-1 indicated that it was not seeking to include any of the costs incurred beyond the demarcation points in the tariff filed by Bell Canada and that costs incurred beyond the demarcation points at which Bell Canada would connect its NG9-1-1 network to data centres would be the responsibility of the Province of New Brunswick.

3. The Commission received interventions from 9-1-1 Tech Advisors; the Alberta E9-1-1 Advisory Association; Bell Canada; Canadian Public Safety Operations Organization (CanOps); la Coalition pour le service 9-1-1 au Québec (la Coalition); le Comité 9-1-1 du Syndicat canadien de la fonction publique au Québec (le Comité 9-1-1); E-Comm 9-1-1; Motorola Solutions Canada Inc. (Motorola); the Newfoundland and Labrador 9-1-1 Bureau (NL9-1-1); Public Safety Broadband Network (PSBN) Consulting; Rogers Communications Canada Inc. (RCCI); Saskatchewan Telecommunications (SaskTel); TELUS Communications Inc. (TCI); the Royal Canadian Mounted Police (the RCMP); and the Winnipeg Police Service (Winnipeg Police).

4. The majority of parties that intervened in response to the application supported NB9-1-1's request for clarification and its intent to adopt hosted CHS. Others raised concerns in relation to cost, security, privacy, and geographical considerations, with some parties proposing additional call handling models.

Telecom Notice of Consultation 2021-404

5. On 9 December 2021, the Commission issued Telecom Notice of Consultation 2021-404 (the proceeding) to address NB9-1-1's application and the additional matters raised by interveners. The Commission expressed the preliminary views that (i) NB9-1-1's proposal to have the NG9-1-1 networks connect to a demarcation point at a site other than a PSAP was inconsistent with the NG9-1-1 framework as outlined in Telecom Regulatory Policy 2017-182, Telecom Decision 2018-188 and

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[1] NB9-1-1 is a department within the Province of New Brunswick Department of Justice and Public Safety.

[2] PSAP call handling functionality deals with the receiving and processing of incoming communications. On-premises call handling requires each PSAP to be connected directly to the 9-1-1 network. Under the hosted CHS model, NG9-1-1 traffic is delivered to the location where the CHS is housed.

Telecom Decision 2019-353, and was therefore not permissible; and (ii) the NG9-1-1 framework did not contemplate hosted CHS and therefore does not currently support it. However, the Commission acknowledged the potential benefits of hosted CHS for PSAPs in relation to cost, procurement, maintenance, and management, all of which may facilitate PSAP transition to NG9-1-1.

6. The Commission also invited NG9-1-1 stakeholders such as NG9-1-1 network providers, local and provincial/territorial governments, telecommunications service providers (TSPs), PSAPs, and vendors, as well as any other interested persons, to provide their views on whether hosted CHS should be introduced in the NG9-1-1 framework. Parties were also invited to provide their views on matters related to Commission-established definitions, interconnection requirements, costs, segregation and mixing of traffic, and reporting and monitoring, as well as requirements in terms of reliability, resiliency, security, and privacy. The Commission indicated that it may impose obligations on some or all TSPs, including NG9-1-1 network providers, regardless of whether they choose to actively participate in the proceeding.

7. The Commission received interventions from 9-1-1 Tech Advisors; Bell Canada; Bragg Communications Incorporated, carrying on business as Eastlink (Eastlink); Calgary 9-1-1, filing jointly with E-Comm 9-1-1 and the Edmonton Police Service (collectively, Calgary 9-1-1 et al.); the Canadian NG9-1-1 Coalition; CanOps; the City of Montreal; la Coalition; le Comité 9-1-1; Motorola; NL9-1-1; the Ontario Ministry of Health (Ontario MoH); NB9-1-1; the Public Interest Advocacy Centre (PIAC); RCCI; SaskTel; Shaw Communications Inc. (Shaw); TCI; the RCMP; and the Winnipeg Police.

8. The record of NB9-1-1's application having been transferred into Telecom Notice of Consultation 2021-404, the Commission addresses interventions to both proceedings in this decision.

Strategic objectives

9. The key objective of the proceeding was to determine whether the NG9-1-1 framework (as established in Telecom Regulatory Policy 2017-182, Telecom Decision 2018-188 and Telecom Decision 2019-353) should be modified to accommodate hosted CHS for PSAPs, and if so, in what manner.

10. The following strategic objectives informed the Commission's decision in the proceeding:

    - To increase the safety of Canadians by giving them the best access to emergency services through world-class telecommunications networks;
    - To provide high-quality information, services, and support to PSAPs, which ultimately enables emergency responders to effectively assist Canadians;

- To introduce NG9-1-1 solutions that are cost-effective, innovative and transparent;
- To use standards-based solutions that allow for flexibility and strive for national consistency; and
- To minimize the possibility of NG9-1-1 calls not being delivered to the appropriate PSAPs.

Issues

11. The Commission has identified the following issues to be addressed in this decision:

    - Should 9-1-1 governing authorities be able to designate demarcation points at non-PSAP sites in the NG9-1-1 networks for the purpose of accessing hosted CHS?
    - If so, what conditions should be imposed on non-PSAP demarcation points (and the networks beyond) so that they may interconnect with the NG9-1-1 networks to provide hosted CHS to PSAPs?
    - Do certain Commission-established definitions need to be modified?
    - Other matters

Should 9-1-1 governing authorities be able to designate demarcation points at non-PSAP sites in the NG9-1-1 networks for the purpose of accessing hosted CHS?

Designation of demarcation points

Background

12. In Telecom Regulatory Policy 2016-165, the Commission defined the demarcation point between the 9-1-1 network and PSAP facilities as a physical boundary where the network infrastructure or hardware of the 9-1-1 service provider connects to that of the PSAP. While this definition was established in the context of E9-1-1, the Commission determined that the definition applies equally to NG9-1-1.

13. In Telecom Regulatory Policy 2017-182, the Commission defined the NG9-1-1 network boundaries as beginning at and including the points of interconnection between the originating networks and the NG9-1-1 networks, and ending at the demarcation points between the NG9-1-1 networks and the PSAPs. In Telecom Decision 2018-188, following an application filed by NB9-1-1 on behalf of various PSAPs and emergency management authorities, the Commission extended the defined boundaries to include secondary PSAPs.

Positions of parties

14. NB9-1-1 submitted that expecting demarcation points to be placed at PSAPs may have made sense under the existing E9-1-1 architecture and at the time Telecom Regulatory Policy 2017-182 was issued, but that this is no longer the case with NG9-1-1. NB9-1-1 added that given the new Internet Protocol (IP)-based networks, the demarcation points need not be located at PSAP premises.

15. The majority of interveners supported the notion that demarcation points need not be located at PSAP sites. CanOps, E-Comm 9-1-1, Motorola, NL9-1-1, and TCI submitted that while it was reasonable and even necessary to limit demarcation points to PSAP premises for Basic 9-1-1 and E9-1-1, this is no longer necessary in an NG9-1-1 environment. A number of parties submitted that the shift from the analogue-based E9-1-1 networks to the IP-based NG9-1-1 networks allows for more flexibility in terms of call handling. In the analogue-based E9-1-1 environment, on-premises call handling is typically performed by private branch exchange (PBX) which provides intercommunication between a large number of telephone stations and requires each PSAP to be connected directly to the 9-1-1 network. In NG9-1-1, this traditional PBX functionality of call handling, processing, and termination to a PSAP operator is performed by an IP-based CHS. Many parties submitted that this creates additional flexibility in terms of where the CHS and, therefore, PSAP boundaries and demarcation points, can be located.

16. NB9-1-1 also submitted that designating demarcation points at non-PSAP sites would reduce the number of locations at which CHS systems must be managed and maintained, which would result in more efficiencies and reductions in cost. In NB9-1-1's case, instead of maintaining call handling equipment at each of its eight provincial PSAPs, CHS would be hosted at two data centres that would serve all eight PSAPs. CanOps, E-Comm 9-1-1, NL9-1-1, RCCI, and TCI agreed that allowing demarcation points to be located at non-PSAP sites for the purpose of accessing hosted CHS could be a more streamlined and cost-effective solution for PSAPs. Motorola submitted that allowing NG9-1-1 service providers to send calls to locations other than PSAPs would enable 9-1-1 governing authorities to leverage IP-enabled innovations in a cost-effective manner. TCI added that giving 9-1-1 governing authorities the flexibility to select their demarcation points in order to take advantage of hosted CHS would lead to a more streamlined NG9-1-1 onboarding process for PSAPs. Similarly, SaskTel submitted that requiring an NG9-1-1 service provider to deliver NG9-1-1 Emergency Services IP Network (ESInet) traffic to a demarcation point located directly at each PSAP location within a province is not efficient from a technical or operational standpoint in a hosted environment.

17. However, Bell Canada, le Comité 9-1-1, PIAC, and the RCMP submitted that removing the requirement for demarcation points to be located at PSAP premises would introduce unnecessary risk to the integrity of the NG9-1-1 network. Specifically, these parties submitted that introducing third-party connectivity between the NG9-1-1 networks and PSAPs would add additional points of failure, potentially lengthen discovery and recovery times in the event of an outage, and

could enable third parties to access or monitor police and law enforcement communications. Bell Canada proposed a hosted CHS topology that mitigates some of these concerns.

18. The majority of parties submitted that it is reasonable and appropriate for 9-1-1 governing authorities to determine demarcation points, with the Canadian NG9-1-1 Coalition, NL9-1-1, the Ontario MoH, and the Winnipeg Police noting that 9-1-1 governing authorities already do so today. SaskTel added that it is reasonable for PSAPs to define the location of their own call handling equipment.

19. The majority of parties, including PSAP-associated groups and all three large ILECs (Bell Canada, SaskTel, and TCI), submitted that it is reasonable and appropriate that PSAP demarcation points be documented within the NG9-1-1 service agreements between the NG9-1-1 network providers and the 9-1-1 governing authorities. Calgary 9-1-1 et al., the Canadian NG9-1-1 Coalition, and SaskTel added that PSAP demarcation points could also be captured in agreements between the individual PSAPs and the NG9-1-1 network providers. Calgary 9-1-1 et al. also submitted that due to the technical nature of the content, another appropriate place to capture the location of demarcation points could be the NG9-1-1 user-to-network (UNI) specifications, which are the specifications for the interconnections between the NG9-1-1 network and the PSAP networks (these specifications are separate from the mandatory conditions that PSAPs must meet prior to interconnecting with the NG9-1-1 network).

20. NB9-1-1, NL9-1-1, the Ontario MoH, and the Winnipeg Police submitted that only local 9-1-1 authorities determine and approve PSAP locations. In contrast, Bell Canada and SaskTel submitted that the location of the PSAP demarcation point should be identified in mutual agreement with the NG9-1-1 service provider. RCCI supported Bell Canada and SaskTel's view, submitting that it would be judicious and prudent for the 9-1-1 governing authorities to discuss and negotiate demarcation points with the ILECs.

Commission's analysis

21. Since the publication of Telecom Regulatory Policy 2017-182, Telecom Decision 2018-188 and Telecom Decision 2019-353, there have been technological advancements that provide opportunities to introduce new and flexible solutions that may not have been contemplated in the original NG9-1-1 framework, including hosted CHS for PSAPs.

22. Interventions relating to the additional flexibility provided by the IP-based NG9-1-1 network reflect the Commission's objective to employ standards-based solutions that allow for flexibility. In terms of NG9-1-1, this includes the ability to (i) reroute traffic to alternative PSAPs in the event that a PSAP is not able to respond to 9-1-1 calls; (ii) maintain reliability and performance of the network even when demarcation points, call handling systems, and telephones are separated by a large geographical distance; and (iii) procure interoperable equipment and services from

different vendors that all adhere to the Commission-approved National Emergency Number Association (NENA) i3 Standard for NG9-1-1 (i3 standard).

23. There is general agreement among parties that the IP-based NG9-1-1 networks' ability to logically route traffic eliminates the need for demarcation points to be physically located at PSAPs. Further, there is general support from the majority of parties for the employment of hosted CHS by PSAPs within the NG9-1-1 environment. Bell Canada proposed alternative hosted CHS topologies to the one proposed by NB9-1-1.

24. In terms of the potential benefits for PSAPs that would arise from designating demarcation points at non-PSAP sites, hosted CHS has the potential to

    - provide another service delivery model that could streamline the PSAPs' onboarding and timely transition to NG9-1-1 by shifting certain logistical and procurement-related burdens from PSAPs to the entities selected to provide NG9-1-1 hosted CHS;
    - reduce the technical burden on PSAPs, since the technical expertise necessary to manage and maintain the CHS, including lifecycle management (e.g. hardware, software, and firmware updates) would be included as part of the service agreement with the hosted CHS provider;
    - allow for the consolidation and therefore reduction of the number of CHS required, since a single hosted CHS site may service multiple PSAPs; and
    - reduce the overall number of physical interconnections, which would increase the cost effectiveness of operating the NG9-1-1 networks and which would be reflected in the associated tariffs.

25. In Telecom Notice of Consultation 2021-404, the Commission acknowledged the potential benefits of hosted CHS for PSAPs in relation to cost, procurement, maintenance, and management, all of which may facilitate PSAP transition to NG9-1-1. For the reasons outlined above, and in line with the strategic objective of providing high-quality information, services and support for PSAPs (which ultimately enables emergency responders to effectively assist Canadians), the Commission considers the use of hosted CHS for PSAPs in the context of NG9-1-1 to be reasonable.

26. The Commission acknowledges the concerns raised by Bell Canada, le Comité 9-1-1, PIAC, and the RCMP with respect to the potential privacy, security, and resiliency risks posed by removing the requirement for demarcation points to be located at PSAP premises. These concerns primarily centre on the introduction of a third party between the NG9-1-1 network provider and PSAPs, which could introduce uncertainties and complications that could in turn compromise the robustness, reliability, resiliency, and overall administration of NG9-1-1 services. The Commission, in a separate section of this decision, makes determinations with regard to mandatory conditions related to the interconnection of a hosted CHS site with the NG9-1-1 network, and the Commission considers that these conditions

would sufficiently address the geography, privacy, security and resiliency concerns raised by parties. Further, the Commission considers that it would be reasonable and appropriate for these conditions to be captured in the NG9-1-1 service agreements between the NG9-1-1 network provider and the 9-1-1 governing authority.

27. In addition, it is already common practice for 9-1-1 governing authorities to provide, within their 9-1-1 service agreements, the locations to which the 9-1-1 networks are to be connected. This is supported by the large ILECs' NG9-1-1 tariffs filed in November 2021, pursuant to Telecom Decision 2021-199.

28. Specifically, as part of their tariff filings, (i) TCI indicated that the locations of PSAPs are designated by the 9-1-1 governing authorities, but PSAPs will determine where the termination equipment/demarcation points are to be located; (ii) SaskTel indicated that it will determine and provide all required facilities to the 9-1-1 (PSAP) IP network interconnection point, pursuant to the agreement between SaskTel and the Saskatchewan Public Safety Agency; and (iii) Bell Canada indicated that it will provide ESInet IP connection to PSAP locations designated by the 9-1-1 governing authority.

29. In order for PSAPs to be able to fully leverage available hosted CHS, 9-1-1 governing authorities should be given the opportunity to establish demarcation points at non-PSAP sites. To a degree, it would be reasonable and appropriate for 9-1-1 governing authorities and their NG9-1-1 network providers to reach mutual consensus regarding the location of demarcation points, and these points should be clearly identified within the NG9-1-1 service agreements between the two entities. However, as noted above, capturing demarcation points in the 9-1-1 service agreements is already a common practice established between the 9-1-1 governing authorities and the 9-1-1 network providers; this ensures that parties clearly understand their responsibilities. For this reason, the Commission considers that it is unnecessary to impose additional specific consensus measures beyond those that already exist in the current 9-1-1 service agreement process in relation to the designation of demarcation points at sites other than PSAPs for the purpose of accessing hosted CHS, subject to certain conditions that are outlined in further sections of this decision.

30. In light of the above, the Commission **determines** that

- 9-1-1 governing authorities can designate demarcation points at hosted CHS sites in the NG9-1-1 networks; such designations would be subject to certain conditions as outlined in subsequent sections of this decision; and
- demarcation points, regardless of whether they are located at a PSAP or a hosted CHS site, must be clearly designated within the NG9-1-1 service agreement between the 9-1-1 governing authorities and the NG9-1-1 network providers.

Recovery of costs

Positions of parties

31. Many parties submitted that it would be appropriate for NG9-1-1 network providers that have incurred costs as a result of connecting their NG9-1-1 networks to a PSAP to receive compensation for these costs if they are asked to move the point of interconnection to a new site as a result of a policy change. Calgary 9-1-1 et al. and SaskTel submitted that cost recovery should be conditional on the 9-1-1 governing authority being consulted prior to the NG9-1-1 network provider connecting its network to the current demarcation points. Otherwise, 9-1-1 governing authorities should not be asked to absorb the cost of relocation.

32. Bell Canada submitted that where an NG9-1-1 network provider has already incurred costs as a result of connecting its NG9-1-1 network to a PSAP, the NG9-1-1 network provider must be able to recover those costs through the NG9-1-1 service tariff. Bell Canada added that, should established circuits need to be removed because of a policy change, the removal costs as well as any stranded investments should also be recoverable through the NG9-1-1 service tariff.

33. Bell Canada also submitted that in a case where a 9-1-1 governing authority directs the NG9-1-1 network provider to deliver NG9-1-1 to any site or location other than a PSAP site, the 9-1-1 governing authority should fully compensate the NG9-1-1 network provider for all additional incremental costs associated with the delivery of NG9-1-1 to the alternative location or site. Motorola submitted that it would be appropriate for NG9-1-1 network providers that have already incurred costs as a result of connecting their NG9-1-1 network to a PSAP to receive compensation for the costs they would incur as a result of connecting to a demarcation point at a site other than a PSAP. Motorola added that the most appropriate way for this cost to be recovered would be through the tariff process.

34. Eastlink, RCCI, Shaw, and TCI submitted that, should the Commission determine that hosted CHS is permissible, the Commission should not allow NG9-1-1 network providers to (i) recover costs arising from rework via the NG9-1-1 tariff, or (ii) pass these costs on to originating network providers (ONPs). Further, Eastlink, Shaw, and TCI submitted that if a 9-1-1 governing authority designates a demarcation point that leads to a change in an existing connection location, any associated costs in changing this location should be incurred by the 9-1-1 governing authority requesting this change. In this regard, TCI indicated that billing 9-1-1 governing authorities for moves, additions, or changes in demarcation points is standard practice. Should the Commission permit flexibility in the location of demarcation points, the Commission should also permit NG9-1-1 network providers to amend their NG9-1-1 service agreements with 9-1-1 governing authorities to include the latter's responsibility for any costs incurred as a result of a change in a demarcation point location.

35. TCI indicated that it has already deployed dual ESInet circuits and facilities for NG9-1-1 at terminating addresses specifically provided by all PSAPs currently operating within TCI's ILEC territory. Similarly, Bell Canada indicated that it had

incurred costs to implement IP connectivity to existing primary PSAPs and to extend its 9-1-1 network to secondary PSAPs across its incumbent operating territory, pursuant to Telecom Regulatory Policy 2017-182 and Telecom Decision 2018-188.

Commission's analysis

36. In Telecom Regulatory Policy 2017-182, the Commission (i) directed all ILECs to establish their NG9-1-1 networks and to be ready to deliver NG9-1-1 Voice service wherever PSAPs have been established in a particular region, and (ii) determined that PSAPs should continue to interconnect directly with the NG9-1-1 networks. In Telecom Decision 2018-188, the Commission determined that the latter statement applies equally to primary and secondary PSAPs. Additionally, in Telecom Regulatory Policy 2017-182, the Commission determined that the costs of building, operating, and maintaining the NG9-1-1 networks would be recoverable via Commission-approved tariffs, paid by TSPs that provide 9-1-1 services to their subscribers.

37. Bell Canada and TCI have confirmed that they have completed the work necessary to directly interconnect PSAPs to the NG9-1-1 networks they operate, in full compliance with the applicable obligations established in Telecom Regulatory Policy 2017-182 and Telecom Decision 2018-188. Further, the costs associated with this work will be recoverable via charges levied on TSPs and, ultimately, end-users, also in accordance with Telecom Regulatory Policy 2017-182.

38. While the Commission recognizes that accessing hosted CHS may provide numerous benefits to PSAPs, it considers that the decision to access hosted CHS lies solely with the 9-1-1 governing authorities and should not result in additional costs to other parties. For this reason, it would not be appropriate for TSPs and their end-users to bear the additional costs associated with the relocation of demarcation points from PSAP premises to a hosted CHS site, or the costs associated with the establishment of new additional connections such as those that would be created between the NG9-1-1 network and the hosted CHS site. Instead, should 9-1-1 governing authorities request modifications to these demarcation points, the 9-1-1 governing authorities should bear the costs of these modifications.

39. However, if a 9-1-1 governing authority has no arrangements in place with its NG9-1-1 network provider for connectivity to its PSAPs and designates demarcation points that are not located at a PSAP as a result of policy change, the cost of establishing these new connections should be recoverable via the existing NG9-1-1 tariffs.

40. In light of the above, the Commission **determines** that,

    - if NG9-1-1 network providers have established NG9-1-1 connections at demarcation points designated by 9-1-1 governing authorities per the direction contained in the original NG9-1-1 framework, any costs associated with relocating these connections for the purpose of accessing hosted CHS by

PSAPs shall not be recoverable via NG9-1-1 tariffs and instead shall be borne by the 9-1-1 governing authority requesting the relocation;

- if 9-1-1 governing authorities designate demarcation points solely at hosted CHS sites, only the costs associated with connections between the NG9-1-1 network and the hosted CHS sites shall be recoverable via the NG9-1-1 tariffs, with the costs associated with connections between the hosted CHS site and the PSAPs being borne by the 9-1-1 governing authorities; and
- if 9-1-1 governing authorities designate demarcation points at both hosted CHS sites and PSAPs, the 9-1-1 governing authorities shall bear the cost of establishing the new connection between the demarcation point at the hosted CHS and the demarcation point at the PSAP. It is understood, however, that this new connection shall be part of the NG9-1-1 network and moving forward, costs associated with traffic transiting over this new connection are eligible to be recovered via the NG9-1-1 tariff.

41. Additionally, the Commission clarifies that the NG9-1-1 network providers are not required to make changes to the network configurations requested by a 9-1-1 governing authority unless the latter is willing to cover the associated costs.

What conditions should be imposed on non-PSAP demarcation points and the networks beyond so that they may interconnect with the NG9-1-1 networks to provide hosted CHS to PSAPs?

Mandatory conditions

Position of parties

42. Many parties submitted that it was reasonable and appropriate for entities providing hosted CHS to PSAPs to be subject to mandatory interconnection requirements in order to be allowed to connect to the NG9-1-1 networks. However, parties generally agreed that it was not necessary for the Commission to introduce any additional interconnection conditions beyond what has already been established in previous Commission decisions.

43. NB9-1-1, NL9-1-1, the Ontario MoH, TCI, and the Winnipeg Police submitted that the interconnection conditions captured in NG9-1-1 service agreements between 9-1-1 governing authorities and the NG9-1-1 network providers would be sufficient to ensure the compatibility, integrity, reliability, and security of the NG9-1-1 networks. Similarly, Bell Canada, the RCMP, and SaskTel submitted that entities connecting to the NG9-1-1 networks for the purpose of providing hosted CHS to PSAPs should be at minimum subject to the same interconnection requirements as PSAPs. Bell Canada and the RCMP referred to the mandatory conditions for i3-standard-compliant PSAPs to interconnect to the NG9-1-1 networks; these conditions are outlined in Telecom Decision 2019-353 and are captured in NG9-1-1 service agreements.

44. NB9-1-1, NL9-1-1, the Ontario MoH, and the Winnipeg Police submitted that the NG9-1-1 service agreements between 9-1-1 governing authorities and NG9-1-1 network providers should not contain any conditions imposed on the hosted CHS provider, indicating that the network connections between PSAPs and third-party hosted CHS providers would be the responsibility of 9-1-1 governing authorities. Similarly, SaskTel submitted that by positioning the hosted CHS provider as an extension of the PSAP, the current NG9-1-1 service agreements would negate the need for any additional agreement or conditions of service for the hosted CHS provider itself.

45. Bell Canada, Calgary 9-1-1 et al., CanOps, the City of Montreal, la Coalition, Motorola, RCCI, and the RCMP all submitted that it is reasonable and appropriate for any interconnection requirements for hosted CHS providers to be included in the NG9-1-1 service agreements between 9-1-1 governing authorities and NG9-1-1 network providers.

46. Further, many parties noted the role that the CRTC Interconnection Steering Committee (CISC) Emergency Services Working Group (ESWG) consensus recommendations process played in the Commission's adoption of NG9-1-1 standards, suggesting that the Commission should continue to rely on this process as 9-1-1 evolves.

Commission's analysis

47. In Telecom Decision 2019-353, the Commission directed NG9-1-1 network providers to include in their NG9-1-1 service agreements specific mandatory requirements for PSAPs to interconnect with the NG9-1-1 networks to ensure compatibility between the NG9-1-1 networks and PSAP networks, as well as to ensure reliability, resiliency, and security measures for NG9-1-1 and interconnecting networks. The Commission therefore considers that entities interconnecting to the NG9-1-1 network for the purpose of providing hosted CHS to PSAPs should be held to the same conditions, for the same reasons and through similar means. However, regardless of where a 9-1-1 governing authority elects to place its demarcation points – whether at a PSAP or at a hosted CHS site – any service agreement covering interconnection with the NG9-1-1 networks will be between the 9-1-1 governing authority and the NG9-1-1 network provider. Therefore, it would be reasonable and appropriate for any mandatory conditions relating to the interconnection of hosted CHS sites to the NG9-1-1 network to be captured in the NG9-1-1 service agreements between 9-1-1 governing authorities and NG9-1-1 network providers.

48. Since the publication of Telecom Decision 2019-353, new developments and standards have arisen with respect to NG9-1-1. As a result, it would be prudent to assess the conditions outlined in that decision to ensure that interconnection requirements meet these latest developments, regardless of whether these requirements are applied to the interconnection of the NG9-1-1 network at a PSAP site or a hosted CHS site. The Commission is of the view that it would be appropriate to leverage the expertise of the ESWG for this purpose. Any

Commission determinations resulting from the ESWG's recommendations in this regard may result in modifications to the NG9-1-1 service agreements already in place, though 9-1-1 governing authorities should continue with their transition to NG9-1-1 in the meantime.

49. In light of the above, the Commission

- **directs** NG9-1-1 network providers to: (i) include within their NG9-1-1 service agreements with 9-1-1 governing authorities the following mandatory conditions (adapted from the conditions imposed in Telecom Decision 2019-353); and (ii) take reasonable measures to ensure that only demarcation points and networks that are compliant with these conditions are connected to the NG9-1-1 network:

  > 9-1-1 governing authorities, as a condition of interconnecting with the NG9-1-1 network, shall ensure that all demarcation points and networks within the PSAP domain (including those of hosted CHS sites)
  >
  > - deploy Dual Stack as the preferred method for simultaneous use of IP version 4 and IP version 6 address space or to individually perform Network Address Translation – Protocol Translation (NAT-PT) for their network domain, as defined in the NG9-1-1 network provider's UNI interconnection specifications;
  > - support a set maximum transmission unit (MTU) value of 1,500 bytes for their network domain;
  > - use the Border Gateway Protocol (BGP) for dynamic routing between peering networks, using registered autonomous system (AS) numbers when available;
  > - use an i3-standard-compliant Border Control Function (BCF), as defined in the NG9-1-1 network provider's UNI interconnection specifications, and deploy BCFs in a manner that prevents single points of failure;
  > - use the quality of service (QoS) strategy defined in the NG9-1-1 network provider's UNI interconnection specifications;
  > - implement the mandatory list of audio CODECs (coder-decoders), which is (i) provided by the NG9-1-1 network providers as part of the production onboarding process, and (ii) updated through the proposed change management process managed by CISC;
  > - use the top-level PSAP Credentialing Agency (PCA) service provided by the NG9-1-1 network provider, as defined in the UNI interconnection specifications; and
  > - abide by any additional conditions that may, in the future, be adopted by the Commission.

- **requests** that CISC, by **17 March 2023**, assess the above conditions and provide recommendations to the Commission to confirm they remain valid and sufficient to ensure compatibility between NG9-1-1 and interconnecting networks, and to ensure effective reliability, resiliency, and security measures for NG9-1-1 and interconnecting networks.

Updates to UNI interconnection specifications

Positions of parties

50. With regard to where the location of demarcation points could be captured, Calgary 9-1-1 et al. suggested that due to the technical nature of the content, demarcation points could be identified in the NG9-1-1 UNI interconnection specifications.

Commission's analysis

51. In Telecom Decision 2019-353, the Commission directed NG9-1-1 network providers to file and make available production UNI specifications to interconnecting PSAPs. The Commission does not consider the UNI interconnection specifications to be an appropriate place for 9-1-1 governing authorities to designate their demarcation points due to the overall generic content of the UNI specifications. However, the Commission considers that in light of the potential new demarcation points at which the NG9-1-1 networks will be interconnected for the purpose of enabling 9-1-1 governing authorities to access hosted CHS for their PSAPs, there may be a need to either update the current UNI interconnection specifications or develop new ones.

52. While separate from each other, new or updated UNI interconnection specifications may need to take into account any updates to the mandatory conditions set out in paragraph 49 above. Consequently, the Commission **directs** NG9-1-1 network providers to file with the Commission, by **17 July 2023**, new or updated UNI interconnection specifications for the provision of NG9-1-1 Voice service and NG9-1-1 Text Messaging service, and to make these specifications available to 9-1-1 governing authorities intending to access hosted CHS services for their PSAPs.

53. In the event that new or updated specifications are not required for interconnection of the NG9-1-1 networks to demarcation points located at hosted CHS sites, the Commission **directs** NG9-1-1 network providers to advise the Commission of this by way of a letter filed by **30 April 2023**, which must include any relevant explanation as to why new or updated UNI interconnection specifications are not necessary.

Geographical considerations

Positions of parties

54. Calgary 9-1-1 et al., NB9-1-1, and NL9-1-1 submitted that it should be mandatory for the PSAP to maintain a minimum network arrangement consistent with the NENA i3 standard and other industry best practices. NB9-1-1 and NL9-1-1 added

that constraints are not necessarily defined by geographical considerations, but are influenced by quality of network connection at a level appropriate for the transport of 9-1-1 traffic. The Winnipeg Police submitted that in NG9-1-1, geography does not play as vital a role in the transport of traffic as it does in the E9-1-1 environment and therefore the data centre location is not as relevant in NG9-1-1.

55. CanOps, the City of Montreal, and la Coalition submitted that there should be a minimum of two geo-redundant sites serving each NG9-1-1 network provider's territory. Bell Canada supported this notion since its NG9-1-1 service agreement indicates that all NG9-1-1-compliant PSAPs are entitled to a backup location. Bell Canada's deployment criteria also indicates that all PSAPs (including backup PSAPs) are provided with two redundant data paths and must make use of both. Similarly, SaskTel indicated that the hosted NG9-1-1 call handling architecture being proposed in Saskatchewan will reside in geographically redundant datacentres.

56. CanOps, the City of Montreal, la Coalition, le Comité 9-1-1, Motorola, the RCMP, SaskTel, and TCI submitted that geographical standards should be applied to entities offering hosted CHS to PSAPs. CanOps and the RCMP submitted that any hosted CHS must be located in Canada, with the RCMP referring to the Commission's determination in Telecom Regulatory Policy 2017-182 that it was appropriate that the NG9-1-1 networks and all information carried over these networks remain under Canadian jurisdiction to the greatest extent possible. Bell Canada, the City of Montreal, la Coalition, le Comité 9-1-1, Motorola, SaskTel, and TCI submitted that the site of the hosted CHS must be within the NG9-1-1 network provider's territory. These parties added that keeping all 9-1-1 call-related traffic within a single NG9-1-1 network provider's serving area boundaries is desirable both from operational and technical perspectives, as it helps ensure security, support, performance, privacy, and resiliency, and allows for better control over costs.

Commission's analysis

57. Having a minimum of two geo-redundant hosted CHS sites would be consistent with 9-1-1 network design principles as established in Telecom Regulatory Policy 2016-165, specifically those pertaining to geo-redundancy. As such, where a 9-1-1 governing authority elects to make use of hosted CHS, its PSAPs should connect to a minimum of two geo-redundant hosted CHS sites (i.e., one primary and one backup). NB9-1-1's proposed plan to access hosted CHS includes two hosted CHS sites to which New Brunswick's eight PSAPs would be connected. The Commission considers it appropriate for NG9-1-1 network providers to apply the relevant 9-1-1 network design principles if a 9-1-1 governing authority requests that they interconnect with a hosted CHS provider, and to do so to the same degree that they would when interconnecting directly with a PSAP. The Commission therefore considers it reasonable and appropriate that NG9-1-1 network providers be made to connect to a hosted CHS site only where the relevant 9-1-1 governing authority has established two geo-redundant sites for the purpose of providing hosted CHS to its PSAPs.

58. As with PSAP site selection, the choice to leverage hosted CHS as well as the selection of the hosted CHS provider are entirely within the 9-1-1 governing authority's purview, and the resulting network between the hosted CHS site and the PSAP will be the responsibility of the 9-1-1 governing authority. In this regard, the Commission has, in the past, encouraged PSAPs to adopt certain best practices in relation to 9-1-1, and considers that it would be appropriate to do so in this matter.

59. With respect to the location of hosted CHS sites, in Telecom Regulatory Policy 2017-182, the Commission directed NG9-1-1 network providers to take all reasonable measures to ensure that all NG9-1-1 network components reside in Canada, and that all traffic transiting their NG9-1-1 networks that is destined for a PSAP in Canada remain in Canada. The Commission therefore considers that demarcation points within the context of hosted CHS must reside in Canada.

60. With respect to the submissions that the site of hosted CHS must be within the NG9-1-1 network provider's territory, locating demarcation points within the ILECs' territory would be consistent with Telecom Regulatory Policy 2017-182 (as modified by Telecom Decision 2018-188) in which the Commission required ILECs, including small ILECs, to, among other things, connect their NG9-1-1 networks to the demarcation points of the primary and secondary PSAPs in their operating territories. The Commission determined that small ILECs could either meet these obligations directly, by building their own NG9-1-1 networks, or indirectly, by outsourcing to other ILECs. Small ILECs have elected to outsource their NG9-1-1 networks to the large ILECs, including connections to the new or modified demarcation points such as those designated at hosted CHS sites, which would be captured within outsourcing agreements. Therefore, the Commission considers that all demarcation points must be within the combined territory of the small ILECs serving the PSAPs and of the large ILECs to whom the small ILECs have outsourced their obligations.

61. In light of the above, the Commission

- **directs** NG9-1-1 network providers, at the request of 9-1-1 governing authorities electing to access hosted CHS for their PSAPs, to connect to demarcation points as designated by the 9-1-1 governing authorities within the NG9-1-1 service agreements, provided that (i) the demarcation points are located within the combined territory of the small ILECs and the adjacent large ILEC, and (ii) the relevant PSAPs are supported by a minimum of two geo-redundant hosted CHS sites; and
- encourages 9-1-1 governing authorities to apply the relevant reliability and resiliency principles and practices when designating their demarcation points and when establishing their hosted CHS.

Traffic mixing and segregation

Positions of parties

62. The majority of parties agreed that non-NG9-1-1 traffic, i.e., administrative or non-emergency traffic, should not be permitted to transit over the NG9-1-1 networks; the exception would be for calls that arrive to the PSAP via the administrative/non-emergency lines but are then determined to be of an emergency nature and need to be escalated or promoted to an emergency call. CanOps specified that all designated NG9-1-1 data flows must be managed appropriately and in accordance with NENA NG9-1-1 data flow standards document, and if a data flow is not described in the NENA standard it can be considered administrative traffic. All three large NG9-1-1 network providers as well as le Comité 9-1-1 and Eastlink added that maintaining the NG9-1-1 network as a highly controlled environment limited to strictly enforced traffic types will promote the national goal of consistent and standardized NG9-1-1 implementation; allowing the transiting of additional traffic types such as non-emergency traffic would have the potential to introduce unnecessary risk to the network with regards to speed, capacity, reliability, and security and resiliency, as well as unnecessary complexity with regard to costs.

63. The Winnipeg Police submitted that it is imperative that non-NG9-1-1 traffic be allowed to transit over the networks to a hosted CHS site; otherwise, the hosted CHS provider would be forced to procure two separate call handling systems – one for the handling of 9-1-1 traffic and another for the handling of all other traffic. Similarly, Calgary 9-1-1 et al. submitted that PSAPs should have the option of using the NG9-1-1 networks for all types of calls, including administrative calls, the cost of which could be borne by PSAPs.

64. With respect to the transiting of NG9-1-1 traffic over commercial lines, such as those that would be established between a hosted CHS site and the hosted CHS provider's client PSAPs, the majority of parties submitted that NG9-1-1 traffic should be permitted to transit over commercial lines once that traffic has been processed by the hosted CHS provider for onward routing to the PSAPs. Bell Canada, CanOps, le Comité 9-1-1 and the RCMP, however, submitted that this should not be permitted because the monitoring, reliability and resiliency design, and provisioning strategies present on the NG9-1-1 network would be absent over commercial lines, which could result in additional risk to the NG9-1-1 environment.

65. To address concerns related to transiting of NG9-1-1 traffic over commercial lines, Bell Canada proposed network topologies in which the NG9-1-1 network would interconnect directly with both the hosted CHS site and each PSAP within Bell Canada's operating territory. This would allow 9-1-1 traffic to flow to the hosted CHS site via the NG9-1-1 network for processing, then back to the NG9-1-1 network for onward routing to the PSAPs. Non-NG9-1-1 traffic would flow from the hosted CHS site via commercial lines or over the NG9-1-1 network via a segregated virtual local area network tunnel. Bell Canada submitted that its proposals would ensure a certain level of monitoring on behalf of the NG9-1-1 network providers. However,

NB9-1-1, SaskTel, and TCI opposed Bell Canada's proposed models, arguing that they would introduce unmanageable levels of technical complexity for the NG9-1-1 network providers, transfer costs onto ONPs, and decrease 9-1-1 governing authorities' options in terms of hosted CHS providers.

66. NB9-1-1, SaskTel, and TCI submitted that all network equipment and facilities beyond the PSAP demarcation points would fall within the domain and responsibility of 9-1-1 governing authorities or PSAPs. NB9-1-1 and SaskTel further submitted that it is not reasonable or feasible for the Commission to restrict or regulate how PSAPs choose to implement their networks. TCI added that it envisioned no other way for the hosted CHS model to work other than by permitting NG9-1-1 traffic to transit over commercial lines. Motorola simply contended that the use of commercial lines is unavoidable in the short term given the network topologies of many PSAPs or potential hosted CHS providers. With respect to maintaining reliability and resiliency in the event of NG9-1-1 traffic transiting over commercial lines, Motorola, the Ontario MoH, and the Winnipeg Police submitted that resiliency and reliability could be maintained by requiring that these circuits conform to the same standards as traffic transiting over the NG9-1-1 network, and by holding hosted CHS providers to these standards by way of service agreements.

Commission's analysis

67. Leveraging the NG9-1-1 network for non-NG9-1-1 traffic would be inconsistent with the overall intent of maintaining a dedicated emergency network for the purpose of delivering and responding to 9-1-1 communications in accordance with the NENA i3 standard. Further, allowing non-emergency traffic on the network would expose the network to unnecessary complications related to capacity and cost segregation, the drawbacks of which would outweigh any potential benefits to PSAPs. The Commission therefore considers that the transiting of non-9-1-1 traffic on the NG9-1-1 network would be inappropriate for reasons related to capacity, resiliency, reliability, security, and cost, including responsibility for such costs (since costs associated with the operation of NG9-1-1 networks are recovered from interconnecting TSPs and are ultimately passed on to end-users).

68. However, given that all PSAPs need a CHS to handle all of their traffic, the Commission acknowledges that certain hosted CHS options will see NG9-1-1 traffic transiting over commercial lines and that there are inherent reliability and resiliency concerns with such configurations. The Commission is of the view that 9-1-1 governing authorities who opt for this option have thoroughly evaluated their options, are motivated to choose their vendors wisely, and are not only driven by cost savings but also by the expertise that vendors bring. Should a major outage of a hosted CHS occur, the 9-1-1 governing authorities (provincial, territorial or municipal governments as the case may be) are responsible and accountable to their citizens. This includes the additional responsibility for the connections over which 9-1-1 traffic transits. By specifying demarcation points in the NG9-1-1 service agreements, it will be clear to the 9-1-1 governing authorities that they are

responsible for these connections as well as everything beyond the demarcation point, including the hosted CHS.

69. Further, options exist for hosted CHS for 9-1-1 governing authorities that do not wish to take on the additional responsibility for the connections over which 9-1-1 traffic transits. As such, the Commission aims to provide 9-1-1 governing authorities with the flexibility to choose options based on their levels of technical expertise, public needs, and public funding. This flexibility is appropriate since 9-1-1 governing authorities are better placed to identify and meet the needs of their regions.

70. The exception to the above would be the escalation of non-emergency calls to emergency calls. Many parties submitted that in the event of a call received over the administrative/non-emergency lines being escalated to an emergency, the call could then be promoted and redirected to the NG9-1-1 network for the appropriate processing and response. The Commission is of the view that regardless of how a call is received by a PSAP, once it is determined that a call requires the intervention of a 9-1-1 operator or first responder it is no longer considered an administrative/non-emergency call, and it would be appropriate to reroute it to the NG9-1-1 network.

71. In light of the above, the Commission **determines** that, for the purpose of delivering traffic to PSAPs, either directly or through a hosted CHS site, the NG9-1-1 ESInet is to be employed solely for the transiting of 9-1-1 traffic, including non-emergency calls that have been promoted to 9-1-1 calls. The ESInet is not to be used for the transiting of PSAP non-emergency or administrative traffic.

72. The Commission acknowledges that, in light of the above determination, implementation of hosted CHS within an NG9-1-1 environment would result in emergency traffic transiting over commercial lines under the care and responsibility of 9-1-1 governing authorities.

Do certain Commission-established definitions need to be modified?

Definition of demarcation point

Background

73. In Telecom Regulatory Policy 2016-165, the Commission defined the demarcation point between the 9-1-1 network and PSAP facilities as a physical boundary where the network infrastructure or hardware of the 9-1-1 service provider connects to that of the PSAP. While this definition was established in the context of E9-1-1, the Commission determined that the definition applies equally to NG9-1-1.

Positions of parties

74. The majority of parties submitted that the definition of a demarcation point should be modified to reflect the point of interconnection at a site other than the PSAP's physical boundary, such as the site of hosted CHS that a 9-1-1 governing authority is using. CanOps, Motorola, and NB9-1-1 submitted that the definition should be modified to make reference to "logical" boundaries, arguing that if a PSAP elects to have a hosted CHS provider process its 9-1-1 traffic, the site of the hosted CHS becomes a logical extension of that PSAP despite that site not being within the PSAP's physical boundary. NL9-1-1, the Ontario MoH, and the Winnipeg Police submitted that the definition of a demarcation point should be modified to establish that the PSAP connection to the hosting site is the responsibility of the 9-1-1 governing authority.

75. SaskTel and TCI submitted that the wording of the current definition of a demarcation point already supports hosted CHS and therefore requires no modification, regardless of whether hosted CHS sites are permitted to interconnect with the NG9-1-1 network.

76. Bell Canada, le Comité 9-1-1, and the RCMP opposed modifying the definition of a demarcation point, submitting that having a third-party CHS between the NG9-1-1 network provider and the PSAP would raise security and privacy issues, prevent the NG9-1-1 network provider from maintaining visibility over the final portion of the network, and prevent the NG9-1-1 network provider from ensuring reliable and resilient services to the PSAP.

Commission's analysis

77. While the current definition of a demarcation point may have been appropriate for the E9-1-1 network (in which PSAP call handling equipment was, in most cases, located within the individual buildings that house the PSAPs due to the nature of the network infrastructure), this definition may be overly restrictive in the context of NG9-1-1 given the flexible nature of IP-based architecture. The overall purpose of a demarcation point, regardless of the context, is to delineate the responsibilities between two interconnecting parties. The Commission is therefore of the view that the additional flexibility offered by the NG9-1-1 network could be reflected in a new definition that (i) shifts the emphasis away from the physical aspects of the boundary in favour of the delineation of responsibilities between the NG9-1-1 network provider and the 9-1-1 governing authority; (ii) removes the limitation of the demarcation point being located specifically at the PSAP; and (iii) makes reference to the 9-1-1 governing authority's prerogative to select the demarcation point.

78. With respect to SaskTel and TCI's argument that the current definition of a demarcation point requires no modification since it already contemplates hosted CHS, the Commission notes that the current definition has caused some disagreement based on various interpretations. It would therefore be beneficial to establish a new definition for a demarcation point that is specific to NG9-1-1.

79. Regarding the concerns raised by Bell Canada, le Comité 9-1-1 and the RCMP with respect to potential security and privacy issues and a lack of visibility over the final portion of the network that could arise from having a third-party hosted CHS between the NG9-1-1 network provider and the PSAP, 9-1-1 network providers currently have no insight into PSAP traffic practices once the traffic crosses into the PSAP domain, regardless of where the location of the demarcation point is. As long as NG9-1-1 network providers continue to deliver 9-1-1 traffic to demarcation points in accordance with industry best practices and 9-1-1 network design principles, regardless of where the demarcation points are physically located, the NG9-1-1 network providers have fulfilled their 9-1-1 obligations as established in the NG9-1-1 framework.

80. In light of the above, the Commission establishes the following new definition for a demarcation point within the NG9-1-1 context:

> In NG9-1-1, the demarcation point is the boundary that delineates the network responsibilities between the NG9-1-1 network providers and the 9-1-1 governing authorities. It can be designated by the latter subject to the demarcation point being (i) located within the combined operating territories of the small ILECs and the adjacent large ILEC, and (ii) captured in the NG9-1-1 service agreement between the 9-1-1 governing authority and its NG9-1-1 network provider(s).

Definitions of primary and secondary PSAPs

Background

81. In Telecom Regulatory Policy 2017-182, the Commission defined a primary PSAP as a PSAP to which 9-1-1 calls are routed directly as the first point of contact. The Commission noted that in most cases, the primary PSAP then contacts the appropriate agency to dispatch emergency responders, but that in some cases where local authorities determine that specialized expertise is required to handle the 9-1-1 call, such as emergency medical services, 9-1-1 calls are then transferred to a secondary PSAP.

82. In Telecom Decision 2018-188, the Commission defined a secondary PSAP as a PSAP to which NG9-1-1 calls are transferred from a primary PSAP and which is directly interconnected to an NG9-1-1 network, allowing for the receipt and display of NG9-1-1 call data.

Positions of parties

83. The majority of parties submitted that no modification would be required to the definitions established for primary and secondary PSAPs, arguing that regardless of whether PSAPs access hosted CHS, the roles and functions of primary and secondary PSAPs remain unchanged.

84. TCI submitted that the current definitions would need to be modified as the current definitions reflect direct interconnection with the NG9-1-1 network. PSAPs accessing hosted CHS would not necessarily be directly interconnected with an NG9-1-1 network.

Commission's analysis

85. As several parties noted, the roles of primary and secondary PSAPs will not change regardless of whether PSAPs are accessing hosted CHS. Primary PSAPs will remain the first point of contact for callers in need of emergency assistance, and secondary PSAPs will remain PSAPs to which a primary PSAP may transfer calls when specialized expertise is required.

86. Notwithstanding the above, if a 9-1-1 governing authority requests that the NG9-1-1 network provider deliver 9-1-1 traffic to a third-party site for the purpose of accessing hosted CHS, it is possible that in certain circumstances the direct interconnections between the affected PSAPs and the NG9-1-1 network referred to in the current PSAP definitions no longer apply; the NG9-1-1 network will be connected to the hosted CHS site, which will then connect to a PSAP via commercial lines. Therefore, it would be appropriate to modify the definitions of primary and secondary PSAPs to reflect a reality in which 9-1-1 governing authorities may elect to have NG9-1-1 traffic delivered to a hosted CHS site that will process and route 9-1-1 calls to the interconnected PSAPs.

87. In light of the above, the Commission establishes the following new definitions of primary and secondary PSAPs in an NG9-1-1 environment:

    a. A primary PSAP is a PSAP to which 9-1-1 emergency requests and associated data are routed as the first point of contact with a 9-1-1 telecommunicator. In most cases, the primary PSAP then contacts the appropriate agency to dispatch emergency responders. However, in cases where local authorities determine that specialized expertise is required to handle the 9-1-1 call, such as emergency medical services, 9-1-1 calls are then transferred to a secondary PSAP; and

    b. A secondary PSAP is a PSAP to which 9-1-1 emergency requests and associated data are transferred from a primary PSAP.

Other matters

Reporting

Positions of parties

88. A number of parties were opposed to the Commission introducing additional reporting requirements as a consequence of non-ONPs, non-NG9-1-1 network providers, and non-PSAP entities interconnecting with the NG9-1-1 network.

89. NB9-1-1, NL9-1-1, and the Ontario MoH submitted that the scope of ESInet reporting and monitoring should end at the demarcation point of the ESInet connection, specifically at the ESInet-facing side of the session border controller (which is an application or a device that enables the secure transfer of data between networks and protects the connections between those networks from unwanted access). However, the Ontario MoH and NL9-1-1 submitted that the 9-1-1 governing authority should have monitoring and reporting requirements in place that include the session border controller to CHS connections and related capacity, response time, and performance activities.

90. PIAC submitted that should hosted CHS be introduced in the NG9-1-1 system, regular reporting and monitoring requirements should be introduced to these hosted CHS providers. This reporting should include such statistics as the number of calls on a daily, weekly, monthly, and annual basis to monitor usage and other related issues, including the response times and any challenges faced, as well as the number of outages and the time it took to address such outages.

91. Calgary 9-1-1 et al. submitted that the same reporting requirements imposed in relation to ONP, NG9-1-1 network provider, and PSAP traffic should also be in place for other entities connecting to the NG9-1-1 network. Similarly, Bell Canada submitted that all non-ONP, non-NG9-1-1 network provider, and non-PSAP entities connected to the NG9-1-1 network should be required to provide their own reporting to the Commission based on the mandatory interconnection requirements, and should be required to provide copies of this reporting to the associated NG9-1-1 network provider. Bell Canada added that such a requirement should be imposed on both the NG9-1-1 network provider and the hosted CHS provider, with a right to terminate the agreement at the Commission's direction should a hosted CHS provider fail to comply.

92. Bell Canada and the RCMP noted that reporting requirements for NG9-1-1 network providers already exist pursuant to Telecom Regulatory Policies 2016-165 and 2017-182. Bell Canada submitted that, to the extent that network outages that cause 9-1-1 service outages are attributable to non-ONPs, non-NG9-1-1 network providers, and non-PSAP entities being connected to the NG9-1-1 network, information on those outages can be included in future reports from NG9-1-1 network providers. Bell Canada submitted, however, that the NG9-1-1 network providers would face challenges in reporting on issues that arise in portions of the network that they do not control. The City of Montreal and la Coalition submitted that the NG9-1-1 network providers should be subject to the obligations to: (i) file a report with the Commission within 48 hours of any threat to the proper operation of the NG9-1-1 network, which should include the measures taken to counter or resolve this issue; and (ii) file a monthly or tri-annual report listing the detected attempts of entities other than PSAPs to connect to the ESInet.

Commission's analysis

93. Pursuant to Telecom Regulatory Policy 2017-182, NG9-1-1 network providers have already been directed to file, by 30 March annually, reports on NG9-1-1 network outages that cause NG9-1-1 service outages (i.e., NG9-1-1 network outages during which any number of NG9-1-1 Voice calls are not delivered to the primary PSAP's demarcation point). These reports must detail, for each outage, the date, duration, and cause of the outage; the affected area; the remedial action taken to address the outage; the number of affected calls; and the total number of NG9-1-1 Voice calls made over the NG9-1-1 networks during the reporting period, broken down by province/territory. The Commission recognizes Bell Canada's willingness to add supplemental information to its annual outage reports relative to outages that impact 9-1-1 service attributable to entities connected to the NG9-1-1 network that are neither ONPs, PSAPs nor other NG9-1-1 network providers.

94. In keeping with the Commission's strategic objective to minimize the possibility of NG9-1-1 calls not being delivered to the appropriate PSAPs, the Commission considers that it would be appropriate to closely monitor the introduction of hosted CHS providers into the NG9-1-1 environment and any impacts that such introduction may have on the delivery of NG9-1-1 calls to PSAPs. The Commission therefore considers that it would be appropriate and reasonable to introduce reporting requirements, and that the most effective manner for parties to provide this information would be through the current annual reports.

95. The Commission acknowledges that NG9-1-1 network providers may face challenges in compiling information on outages affecting networks beyond demarcation points. As such, it may be necessary for 9-1-1 governing authorities to actively disclose such information to the NG9-1-1 network providers. To ensure effective reporting of such outages, NG9-1-1 service agreements should reflect the need to disclose information on outages.

96. In light of the above, the Commission **directs** NG9-1-1 network providers

    - to incorporate into their NG9-1-1 outage reports (the first being due **30 March 2023**) all 9-1-1 service outages that are attributable to hosted CHS providers or the connections between the hosted CHS providers and the relevant PSAP(s); and
    - to provide, for each of these service outages, the date, duration, and cause of the outage; the affected area(s); the remedial action(s) taken to address the outage; and the number of affected calls, if this information is available.

97. Pursuant to Telecom Regulatory Policy 2017-182, these reports are to cover the period of 1 January to 31 December of the preceding calendar year, and abridged versions of these reports, including aggregated information regarding outages, are to be filed for the public record.

Integration with three-digit abbreviated code for mental health crisis and suicide prevention services

98. In Telecom Notice of Consultation 2021-191, the Commission sought comments on matters related to the implementation of a national three-digit code for mental health crisis and suicide prevention services. This includes how this three-digit code could be interconnected with 9-1-1 network in order to permit the transfer of calls between both systems.

99. In Telecom Notice of Consultation 2021-404, the Commission requested that parties express their views on the impacts that allowing or not allowing administrative/non-emergency traffic on the NG9-1-1 network would have on the interaction between the NG9-1-1 network and the three-digit abbreviated dialing code for mental health crisis and suicide prevention services.

100. With respect to the establishment of a three-digit abbreviated dialing code (9-8-8) for mental health crisis and suicide prevention services in Telecom Regulatory Policy 2022-234, the Commission has determined that the interconnection of the 9-8-8 service with 9-1-1 is not warranted at this time, but that such interconnection could be assessed at a later date, once NG9-1-1 has reached an appropriate level of maturity.

101. The Commission considers that given the current status of NG9-1-1 implementation, 9-8-8 service, and the concept of hosted CHS for PSAPs, it is premature for the Commission to make any determinations with regard to the interoperability of these systems and capabilities.

102. As such, the Commission **determines** that it is currently premature to address the potential interactions between the NG9-1-1 network, hosted CHS, and the 9-8-8 service.

Conclusion

103. The Commission finds that the use of hosted CHS for PSAPs in the context of NG9-1-1 would be appropriate. Accordingly, the Commission **determines** that

- 9-1-1 governing authorities can designate demarcation points at hosted CHS sites in the NG9-1-1 networks; such designations would be subject to certain conditions;
- demarcation points, regardless of whether they are located at a PSAP or a hosted CHS site, must be clearly designated in the NG9-1-1 service agreements between 9-1-1 governing authorities and NG9-1-1 network providers;
- the costs associated with relocating demarcation points at which the NG9-1-1 network provider has already terminated its NG9-1-1 network in accordance with the NG9-1-1 framework shall be borne by the 9-1-1 governing authority requesting the relocation; if a 9-1-1 governing authority designates demarcation points solely at hosted CHS sites, only the costs associated with the connections between the NG9-1-1 network and the hosted CHS sites shall

be recoverable via the NG9-1-1 tariffs. The costs associated with connections between the hosted CHS site and PSAPs shall be borne by the 9-1-1 governing authorities;

- if 9-1-1 governing authorities designate demarcation points at both hosted CHS sites and PSAPs, the costs of the new connection established between the demarcation point at the hosted CHS sites and the demarcation point at the PSAPs shall be borne by the 9-1-1 governing authorities.

104. The Commission **directs** NG9-1-1 network providers to

- include in their NG9-1-1 service agreements with 9-1-1 governing authorities certain conditions related to interconnection; and
- take reasonable measures to ensure that only demarcation points and networks that are compliant with these conditions are connected to the NG9-1-1 networks.

105. The Commission requests that the ESWG, by **17 March 2023**, assess and provide recommendations to the Commission with regard to the conditions set out in paragraph 49 above to confirm that they remain valid and sufficient to ensure compatibility between NG9-1-1 and interconnecting networks, as well as to ensure effective reliability, resiliency, and security measures for NG9-1-1 and interconnecting networks.

106. The Commission also **directs** NG9-1-1 network providers, by **17 July 2023**,

- to file with the Commission new or updated UNI specifications for the provision of NG9-1-1 Voice service and NG9-1-1 Text Messaging service; and
- to make these specifications available to 9-1-1 governing authorities intending to access hosted CHS services for their PSAPs.

107. In the event that new or updated specifications are not required for interconnection of the NG9-1-1 networks to demarcation points located at hosted CHS sites, the Commission **directs** NG9-1-1 network providers to file a letter by **30 April 2023** explaining why new or updated interconnection specifications are not necessary.

108. The Commission further **directs** NG9-1-1 network providers, at the request of 9-1-1 governing authorities electing to access hosted CHS for their PSAPs, to connect to demarcation points as designated by the 9-1-1 governing authorities in the NG9-1-1 service agreements, provided that (i) the demarcation points are located within the combined territory of the small ILECs and the adjacent large ILEC, and (ii) the relevant PSAPs are supported by a minimum of two geo-redundant hosted CHS sites. The Commission encourages 9-1-1 governing authorities to apply the relevant reliability and resiliency principles and practices when designating their demarcation points and when establishing their hosted CHS.

109. For the purpose of delivering traffic to PSAPs, either directly or to a hosted CHS site, the Commission **determines** that the NG9-1-1 ESInet is to be employed solely for the purpose of transiting 9-1-1 traffic, including non-emergency calls that have been promoted to 9-1-1 calls. In light of this, the Commission acknowledges that implementation of hosted CHS within an NG9-1-1 environment would result in emergency traffic transiting over commercial lines under the care and responsibility of 9-1-1 governing authorities.

110. The Commission **determines** that certain revised definitions are required. First, the Commission establishes a new definition of a demarcation point to reflect an interconnection point between the NG9-1-1 network and the 9-1-1 governing authority's network, as designated by the 9-1-1 governing authority. The Commission also modifies the definitions of primary and secondary PSAPs to reflect the possibility that they may no longer directly interconnect with an NG9-1-1 network should the 9-1-1 governing authority elect to access hosted CHS.

111. With respect to monitoring and reporting, the Commission **directs** NG9-1-1 network providers to

- incorporate into their NG9-1-1 outage reports service outages that are attributable to hosted CHS providers or the connections between the hosted CHS site and the relevant PSAPs, and
- provide details on all 9-1-1 service outages that are attributable to hosted CHS or the connections between the hosted CHS site and the relevant PSAPs.

112. Finally, the Commission **determines** that it is currently premature to address the potential interactions between the NG9-1-1 network, hosted CHS, and the 9-8-8 service.

Policy Directions

113. The 2006 Policy Direction[3] requires that the Commission, in implementing the telecommunications policy objectives set out in section 7 of the *Telecommunications Act* (the Act), rely on market forces to the maximum extent feasible as the means of achieving the policy objectives. Further, when relying on regulation, the Commission should use measures that are efficient and proportionate to their purpose and that interfere with the operation of competitive market forces to the minimum extent necessary to meet the policy objectives.

114. With respect to (i) the establishment of new mandatory interconnection conditions for 9-1-1 governing authorities who elect to leverage hosted CHS; (ii) the segregation of call traffic; and (iii) the expansion of reporting obligations for NG9-1-1 network providers, the Commission considers that the determinations in this decision will help ensure the continued provision of robust 9-1-1 access services,

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

which is a critical telecommunications service that plays a central role in fulfilling the policy objective set out in paragraph 7(h) of the Act.[4] By taking advantage of the flexibility of the IP-based NG9-1-1 network and allowing 9-1-1 governing authorities to leverage hosted CHS that could facilitate the transition to NG9-1-1, the determinations in this decision also assist in the implementation of the policy objectives set out in paragraphs 7(a), (b), (c) and (g) of the Act.[5]

115. With regard to the determinations pertaining to mechanisms through which NG9-1-1 network providers can recover costs associated with the relocation of established interconnection points between NG9-1-1 networks and those of 9-1-1 governing authorities, the Commission considers that these determinations give proper recognition to the significant additional costs which such relocations entail. As such, the determinations in this decision serve to further the implementation of the policy objectives set out in paragraphs 7(b) and 7(h) of the Act.

116. The operation of the NG9-1-1 networks is not subject to competitive market pressures and as such, with respect to interconnection specifications for the NG9-1-1 networks, the Commission cannot rely on market forces and must actively regulate. The Commission considers that the interconnection measures outlined in this decision are efficient and proportionate to their purpose in that they balance the interests of PSAPs and 9-1-1 governing authorities with the interests of TSPs and end-users. The added flexibility of the measures outlined in this decision allows PSAPs and 9-1-1 governing authorities to better manage the delivery of 9-1-1 services and the associated costs; this flexibility does not unduly undermine the robustness of the NG9-1-1 network, and ultimately ensures that end-user costs are minimized.

117. Regarding the modification of Commission-established definitions for demarcation points and primary and secondary PSAPs, the Commission considers that such modifications respond to the economic requirements of 9-1-1 governing authorities in accordance with paragraph 7(b) of the Act, which will ultimately enable emergency responders to effectively assist Canadians.

118. Additionally, the 2019 Policy Direction[6] provides that when the Commission exercises its powers and performs its duties under the Act, it should consider how its decisions can promote competition, affordability, consumer interests, and

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[4] The cited policy objective is: 7(h) to respond to economic and social requirements of users of telecommunications services.

[5] The cited policy objectives are: 7(a) to facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich, and strengthen the social and economic fabric of Canada and its regions; (b) to render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada; (c) to enhance the efficiency and competitiveness, at the national and international levels, of Canadian telecommunications; and (g) to stimulate research and development in Canada in the field of telecommunications and to encourage innovation in the provision of telecommunications services.

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

innovation. Moreover, the Commission should, in its decisions, demonstrate its compliance with the 2019 Policy Direction. The Commission considers that the modifications to the definitions of demarcation points and primary and secondary PSAPs, and the introduction of conditions whereby hosted CHS is permissible in the NG9-1-1 networks will enable the timely transition of PSAPs to NG9-1-1 and will promote the interests of Canadians through the provision of reliable and efficient NG9-1-1 access services across the country. Further, the determinations in this decision related to recovery of costs associated with relocation of existing interconnection points promotes the affordability of telecommunications services.

Secretary General

Related documents

- *Introduction of 9-8-8 as the three-digit abbreviated dialing code for mental health crisis and suicide prevention services and Northwestel Inc.'s application for modified implementation of ten-digit local dialing*, Telecom Regulatory Policy CRTC 2022-234, 31 August 2022
- *Call for comments – Hosted call handling solutions for public safety answering points on the next-generation 9-1-1 network,* Telecom Notice of Consultation CRTC 2021-404, 9 December 2021; as amended by Telecom Notice of Consultation CRTC 2021-404-1, 16 March 2022
- *Call for comments – Introduction of a three-digit abbreviated dialing code for mental health crisis and suicide prevention services,* Telecom Notice of Consultation CRTC 2021-191, 3 June 2021; as amended by Telecom Notice of Consultation CRTC 2021-191-1, 30 November 2021
- *Establishment of new deadlines for Canada's transition to next-generation 9-1-1,* Telecom Decision CRTC 2021-199, 14 June 2021
- *CISC Emergency Services Working Group – Consensus report on matters related to compatibility, reliability, resiliency, and security for next-generation 9-1-1,* Telecom Decision CRTC 2019-353, 22 October 2019
- *New Brunswick 9-1-1 Bureau, on behalf of public safety answering point organizations – Application to review and vary Telecom Regulatory Policy 2017-182 regarding next-generation 9-1-1 services*, Telecom Decision CRTC 2018-188, 28 May 2018
- *Next-generation 9-1-1 – Modernizing 9-1-1 networks to meet the public safety needs of Canadians,* Telecom Regulatory Policy CRTC 2017-182, 1 June 2017; as amended by Telecom Regulatory Policy CRTC 2017-182-1, 28 January 2019
- *Matters related to the reliability and resiliency of the 9-1-1 networks,* Telecom Regulatory Policy CRTC 2016-165, 2 May 2016