



## Telecom Decision CRTC 2023-235

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### **CISC Emergency Services Working Group – Consensus report ESRE0100 – Follow-up report on handset-based location implementation in Canada**

#### **Summary**

The Commission **approves**, with modifications, the recommendations set out in the CRTC Interconnection Steering Committee’s Emergency Services Working Group’s consensus report ESRE0100 related to handset-based location implementation.

With this decision, the Commission, the Canadian wireless industry, and Canada’s 9-1-1 stakeholders continue to improve the safety of Canadians by improving the quality of location data for 9-1-1 calls.

#### **Background**

1. The location of an emergency is a critical part of the information needed to provide assistance to callers in emergency situations. Location information guides important decisions, beginning with the routing of the 9-1-1 call to the correct public safety answering point (PSAP). It helps to determine which first response resources should be dispatched, and to identify the quickest route to the incident.
2. With the evolution of wireless telephone service, the Commission issued several decisions mandating wireless carriers<sup>1</sup> to provide an estimated location for wireless 9-1-1 calls. Wireless carriers implemented location estimation service in two phases, based on the evolution of location determination technology.
3. First, in Telecom Decision 2003-53, wireless carriers were required to implement wireless Enhanced 9-1-1 (E9-1-1)<sup>2</sup> Phase I service. With that service, a wireless 9-1-1 caller is connected to a PSAP that serves the area of the cell tower to which the

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<sup>1</sup> Wireless carriers are carriers that provide wireless services and own the network facilities required to do so.

<sup>2</sup> Enhanced 9-1-1 service includes basic 9-1-1 service (which enables callers to connect to 9-1-1 operators who dispatch the appropriate emergency responders) but also automatically provides 9-1-1 operators with ancillary information, such as the telephone number and location of the caller.

caller's telephone is connected. Phase I service provides the PSAP with the caller's telephone number, wireless service provider (WSP),<sup>3</sup> and cellular tower location.

4. Subsequently, in Telecom Regulatory Policy 2009-40, the Commission required the implementation of wireless E9-1-1 Phase II service, which resulted in a considerable improvement in the accuracy of location information for wireless 9-1-1 calls. In addition to Phase I information, Phase II includes a caller's estimated latitude and longitude (X and Y) coordinates. These are determined using network-based technologies.<sup>4</sup>
5. Wireless E9-1-1 Phase II service was considered by industry stakeholders to be the best network location technology available until the development of handset-based location technology, the subject of this decision.

### **Advanced mobile location**

6. While the network-based calculations used in Phase II location generally yield accurate information, for some wireless emergency calls the location cannot be accurately determined by Phase II methods when the call is made from a location where network-based functions may not be available, most commonly from indoors. However, new technology, known as advanced mobile location (AML), has been developed to address that shortcoming.
7. AML is a handset-based location protocol that was developed for smartphones. AML can be used to find caller location for 9-1-1 calls made from smartphones that use either an Android operating system (Android devices) or an iPhone operating system (iOS devices). In Canada, this accounts for the vast majority of smartphones.
8. AML protocol uses handset-based location technology to determine the location of a smartphone. Android devices use Google's Emergency Location Service (ELS); iOS devices use Apple Hybridized Emergency Location (HELO). Both services supplement network-determined location information and send enhanced location information directly from the handset to a designated endpoint, e.g., a PSAP.
9. For both ELS and HELO, the programs for capturing location information are built into the smartphone's operating system. They are not controlled by the WSP.
10. AML relies heavily on Wi-Fi location information, which is based on nearby Wi-Fi routers, most of which are short-range and located indoors.
11. Google and Apple continuously map cellular towers and identifiable Wi-Fi hot spots, among other locations. The resulting data is provided to Android- or iOS-based smartphones on an ongoing basis. The smartphone applies mathematical calculations

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<sup>3</sup> WSPs provide wireless services but may or may not own all or a portion of their network facilities.

<sup>4</sup> Network-based technologies include assisted Global Positioning System, trilateration and Round-Trip Time.

that use this location data to determine the location of the smartphone, also on an ongoing basis.

## Regulatory history

12. In light of the opportunity to use AML to improve 9-1-1 wireless location accuracy, the CRTC Interconnection Steering Committee (CISC) Emergency Services Working Group (ESWG) has submitted reports and recommendations to the Commission regarding the implementation of AML in Canada.
13. In Telecom Decision 2021-210, the Commission directed WSPs to take certain steps towards the implementation of handset-based location, and requested the ESWG to complete the work associated with several matters identified for further consideration. Deadlines for those activities were set relative to a target date of 1 March 2022 for implementation of handset-based location technology in Canada.
14. However, those deadlines conflicted with other deadlines associated with next generation 9-1-1 (NG9-1-1). As a result, in Telecom Decision 2022-54 the Commission suspended all deadlines set out in Telecom Decision 2021-210. The Commission also requested the ESWG to submit a report recommending new timelines, and additional amendments as warranted, by 28 March 2022.
15. In response, on 10 March 2022 the ESWG filed a consensus report, *Proposed Changes to Dates and Direction in Telecom Decision CRTC 2021-210* ([ESRE 0095](#)), in which it submitted that it had developed a detailed plan for a proof of concept to inform and guide the next steps of implementing handset-based location technology in Canada. The ESWG also indicated that it was finalizing a proof-of-concept trial, to be completed in August 2022.
16. The proof of concept included three high priority objectives:
  - i. determining whether the HELO handset location validation process is required;
  - ii. executing the ELS and HELO proof-of-concept activities; and
  - iii. finalizing the configuration requirements for ELS and HELO handset-based location technology in Canada and including them in a final follow-up report.
17. The ESWG recommended that suspension of the implementation date for handset-based location should continue until completion of the proof of concept.
18. In Telecom Decision 2022-237, the Commission approved the recommendations, and
  - i. determined that the implementation date for Canadian handset-based location technology approved in Telecom Decision 2021-210 would continue to be suspended until the ESWG had completed the proof of concept and filed a final follow-up report;

- ii. requested that the ESWG file its final follow-up report by 16 December 2022;
- iii. suspended, until further notice, the direction in paragraph 44 of Telecom Decision 2021-210 for aggregators and WSPs to enter into agreements with Apple and Google to enable Canadian ELS and HELO configurations;
- iv. requested that the determination of whether Saskatchewan Telecommunications (SaskTel) should be a third Canadian aggregator be included in the ESWG's final follow-up report; and
- v. requested that the determination of whether a baseline cell data accuracy criterion is required for Canada be included in the ESWG's final follow-up report.

## The report

19. On 15 December 2022, in response to the Commission's request for a final follow-up report on the implementation of handset-based location, the ESWG submitted the following consensus report (the report) for Commission approval:
  - *Handset-based Location Implementation in Canada – Follow-up* ([ESRE0100](#)), 15 December 2022
20. The report can be found in the "Reports" section of the ESWG page, which is available in the CISC section of the Commission's website at [www.crtc.gc.ca](http://www.crtc.gc.ca).
21. The report provides the results of the proof of concept, which involved setting up and executing test cases in a laboratory environment with Bell Canada and TELUS Communications Inc. (TCI) as Google aggregators, and with select facilities-based WSPs from across Canada.<sup>5</sup> It also includes a proposed schedule for the implementation of handset-based location technology.
22. The report is based on the views of 9-1-1 stakeholders, including WSPs, NG9-1-1 network providers, PSAPs, representatives from Google and Apple, and wireless mobile telecommunications subject matter experts. It relies on numerous submissions from ESWG participants and subject matter experts, and on reports and recommendations concerning handset-based technology published by the European Emergency Number Association and the National Emergency Number Association. There was consensus among ESWG participants regarding the recommendations.
23. The report restates the ESWG's conclusion, from [ESRE0092](#), that E9-1-1 location can be enhanced based on the capabilities and requirements of ELS and HELO programs, as follows:

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<sup>5</sup> These were Bell Mobility Inc., Freedom Mobile Inc., Rogers Communications Canada Inc., and TELUS Mobility.

- Both ELS and HELO calculate location at the handset. Both systems use GPS [Global Positioning System], cellular and Wi-Fi sensors to make that calculation. For both, the availability of Wi-Fi provides greater accuracy, especially indoors.
- However, ELS and HELO differ in the manner in which they make handset location information available to the WSP. The ELS program must be pre-configured to push that information to pre-defined aggregation points. For HELO, handset location information must be pulled by a WSP through a network-initiated location request query.
- Thereafter, for both systems, the WSP can perform a validation check, evaluate the best location and forward the result to the PSAP using the existing Phase II configuration.

24. The report addresses the following high priority matters for further consideration from ESRE0092:

- confirmation of ELS configuration, with a proposed implementation schedule;
- confirmation of HELO configuration, with a proposed implementation schedule; and
- implementation of a tool to enable PSAPs in Basic 9-1-1 (B9-1-1) areas to potentially receive wireless location data.

25. The ESWG finalized ELS and HELO configuration requirements and set out a detailed schedule to implement them in the report.

26. The ESWG concluded that the implementation of a structured tool to enable PSAPs in B9-1-1 areas to receive wireless location data is not necessary at this time. The ESWG also investigated, and described in the report, a tool for the web-based delivery of unvalidated wireless location data that has been implemented in Newfoundland and Labrador and the Northwest Territories; however, as this tool relies on a private business arrangement, it is outside the scope of the ESWG.

27. The report also addresses the majority of the other items identified as matters for further consideration in ESRE0095. Items not addressed are reiterated as new matters for future consideration.

28. The proof of concept resulted in a detailed analysis of the potential timer configuration for processing ELS found in Appendix 1 of Telecom Decision 2021-210. The following table shows the confirmed configurations for ELS timers.

ELS Timers	Value
Sampling mode with first 35 seconds of 9-1-1 call	First available fix, 7 seconds, 20 seconds
Tracking mode (defined intervals until the call ends)	30 seconds

29. The proof of concept confirmed that iOS devices provide Wi-Fi and other location sensor data, which can be used to respond to network requests in real time. Because Wi-Fi-derived information is provided in the same way as GPS information, there is no need for timing configurations or aggregation points to collect data for HELO. Also, because the platform for iOS devices is configured to support a HELO response, there is no separate network-based location at which to undertake a validation check. These findings changed the original configuration proposed in consensus report ESRE0092 and had an impact on the related determination in Telecom Decision 2021-210.<sup>6</sup>
30. Overall, the ESWG found the proof of concept to be extremely helpful in determining the optimum way to design and implement ELS and HELO. In particular, it indicated that the implementation of ELS and HELO would require no new interconnections because of the ability to utilize existing emergency services Internet Protocol network (ESInet) interconnections and the existing Phase II location delivery to PSAPs.
31. The proof of concept included an assessment of the need for three ELS aggregators. Bell Canada, SaskTel and TCI, as NG9-1-1 service providers, have the required infrastructure in place. The ESWG confirmed Bell Canada and TCI as ELS aggregators and determined that a third aggregation point was not required, nor would it be supported by Google.
32. The report also identifies additional matters for further consideration. One of these is in regard to implementation of location information based on a vertical coordinate, or the z-axis. This would provide additional information about the location of the 9-1-1 caller, perhaps an apartment number or floor identifier, based on vertical height above a fixed point of reference.
33. The ESWG made several proposals based on the report's conclusions. Specifically, the ESWG requested that the Commission
- i. approve the recommendations listed in section 6 of the report and direct WSPs to implement handset-based location in Canada by 31 March 2024; and
  - ii. request the ESWG to complete the work associated with the matters for further consideration listed in section 7 of the report.

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<sup>6</sup> See paragraph 47.

## Commission's analysis

34. The Commission considers the ESWG's recommendations to be reasonable and consistent with the broader strategic objectives set out in the NG9-1-1 framework, namely (i) to increase the safety of Canadians by giving them the best access to emergency services through world-class telecommunications networks; (ii) to provide high-quality information, services, and support to PSAPs, which will ultimately enable emergency responders to effectively assist Canadians; and (iii) to use standards-based solutions that allow for flexibility and to strive for national consistency in their application.<sup>7</sup>
35. The Commission is of the view that, because approximately 80% of 9-1-1 calls are made on wireless devices, improvements to the accuracy of the location information that such devices provide will do a great deal to improve first response to the majority of 9-1-1 calls in Canada.
36. The Commission acknowledges the comprehensiveness of the report, which includes the results of a detailed proof of concept that assesses testing done by Bell Canada and TCI as data aggregators and Bell Mobility Inc., Freedom Mobile Inc., Rogers Communications Canada Inc., and TELUS Mobility as WSPs. The study benefited from the testing of several options related to different technical and operational aspects of implementing handset-based location technology; from shared knowledge with respect to the web-based delivery of unvalidated wireless location data; and from expert contributions provided by representatives of Google and Apple.
37. Regarding the ESWG's assessment of the need for a third aggregation point, i.e., SaskTel, the Commission considers that the aggregation model whereby Bell Canada and TCI act as national aggregators, including in SaskTel's territory, provides a good foundation for the interconnections required to facilitate the future inclusion of additional handset-determined data subject to future determinations by the Commission. Having two aggregators will provide reliability and redundancy nationally, especially in light of the use of the NG9-1-1 network with all of its inherent built-in resiliency measures.
38. The Commission notes that the ESWG has confirmed configurations for a new process with which to validate ELS and HELO handset location information against Phase I and Phase II location information. With the new process, only the most accurate location—either the Phase II location or handset-determined location—will be sent to the PSAP. This will ensure that PSAPs have the most accurate location information available in the shortest time possible, and do not have to determine which is most accurate.

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<sup>7</sup> See Telecom Regulatory Policy 2017-182, paragraph 24.

39. The Commission also notes that the process the report recommends for sending the most accurate location information to PSAPs uses the existing Phase II process and would therefore not require additional training or expenditures for PSAPs.
40. The ESWG investigation of the tool for the web-based delivery of wireless handset-based location information to PSAPs may result in the provision of additional, key information to first responders in areas that have B9-1-1 service, enabling them to respond more quickly and effectively thereby increasing the safety of Canadians.
41. Regarding the timing of sending handset-based location information to an aggregator, the Commission notes that the ESWG's recommended option, the sampling mode, aligns with the location request timing that the Commission approved in Telecom Decision 2020-373.
42. The recommendations included in the report will impact the vast majority of wireless handsets in Canada and benefit consumers in a similar proportion, which aligns with the Commission policy of improving the 9-1-1 caller location information provided to PSAPs.<sup>8</sup>
43. The Commission notes that handsets other than Android and iOS devices are not considered in the report, and reiterates its request in Telecom Decision 2021-210<sup>9</sup> that the ESWG's monitoring and reporting activities with regard to location accuracy include such devices.
44. Regarding the Commission's request in Telecom Decision 2022-237 that the report include the determination of whether a baseline cell data accuracy criterion is required for Canada, the Commission notes that the ESWG has determined, within the work associated with the Period 9 Wireless Location Accuracy Results Performance Assessment, that such a criterion is required. The ESWG has also implemented a measure that was included with the Period 9 Wireless Location Accuracy Performance Results Assessment.
45. Regarding the deadlines recommended for the implementation of ELS and HELO, the Commission considers that those deadlines should be modified to ensure that all impacted parties have sufficient time to complete the work required.
46. Regarding the matters for further consideration listed in section 7 of the report, the Commission considers that timelines for the completion of the various items should be added, as follows:
  - i. Items 1 and 2 should be addressed in a report submitted to the Commission by 30 December 2023, after related activities are concluded in mid-October.

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<sup>8</sup> See Telecom Regulatory Policy 2014-342, paragraph 18.

<sup>9</sup> See paragraph 48.



- ii. Item 3, if required, would be addressed after one year of data has been collected and analysed, possibly by late 2025. If the analysis is positive, then no further action will be required.
- iii. Items 4.a. and 4.b. are ongoing monitoring activities on which the ESWG should report as applicable.

## Conclusion

47. In light of all of the above, the Commission **approves** the report and its recommendations, with modifications, namely changes to certain recommended timelines and the addition of timelines for the recommended matters for further consideration.
48. Therefore, in accordance with the report's recommendations, and in order to implement handset-based location in Canada by **30 April 2024**, the Commission is setting out requirements and timelines for the implementation of ELS and HELO.
49. With regard to the recommendation that Bell Canada and TCI make updated network-to-network interface (NNI) specifications available to interconnecting parties by 14 April 2023, the Commission notes that this task has been completed.
50. With regard to ELS, the Commission **directs** Bell Canada and TCI as the aggregators for ELS, and all facilities-based WSPs, to take steps in preparation for the implementation of ELS as set out below:
- 1) Facilities-based WSPs are to reconfigure their existing NG9-1-1 interconnections to Bell Canada and/or TCI using the updated NNI to support ELS by **16 August 2023**. New facilities-based WSPs must establish interconnection to Bell Canada and/or TCI after inception of the NNI.
  - 2) Bell Canada and TCI are to commence pre-production testing with facilities-based WSPs by **21 August 2023**.
  - 3) WSPs are to undertake pre-production testing with Bell Canada and/or TCI between **21 August 2023** and **20 November 2023**. WSPs are to confirm the operation of their gateway mobile location centres and handsets, and undertake any other tests required.
  - 4) Facilities-based WSPs, Bell Canada and TCI are to provision ELS handset-based location technology for 4G [fourth-generation] wireless networks, and for 5G [fifth-generation] wireless networks where they have been implemented, in areas with NG9-1-1 service by **30 April 2024**.
  - 5) Bell Canada and TCI are to ensure that their agreements with Google will include the following ELS configuration:

- a. set the emergency number as 9-1-1;
  - b. set the minimum handset battery percentage threshold at 10% (i.e., ELS will not be calculated or delivered below 10%);
  - c. push the ELS location data to Bell Canada and TCI simultaneously;
  - d. test and confirm ELS timers as follows:
    - i. deliver the initial handset first fix location as soon as it is available;
    - ii. set the sampling mode timer at 7 and 20 seconds;
    - iii. set the tracking mode timer at every 30 seconds for the duration of the call; and
    - iv. set the ELS location confidence level at 90%.
- 6) Bell Canada and TCI are to deliver the ELS location using HTTPS<sup>10</sup> to the applicable WSPs.
- 7) Once ELS is provisioned, facilities-based WSPs are to enable the following processes for all wireless 9-1-1 calls that are placed from ELS-compatible handsets on their networks:
- a. undertake a validation process to ensure the ELS location result and/or the calculated control plane location are within the Phase I serving area;
  - b. compare the Phase II location with the ELS location to determine which is the most accurate and send it to the PSAP using the existing Phase II configuration; and
  - c. maintain the current in-call location update (ICLU) process (no Phase II configuration changes are required; however, that process may now include ELS location data from the WSP as part of the most accurate location calculation).

51. With regard to the implementation of HELO, the Commission **directs** facilities-based WSPs to

- 1) provision HELO for 4G wireless networks, and for 5G networks where they have been implemented, within NG9-1-1-served territory by **30 April 2024**;

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<sup>10</sup> HTTPS is a secure communication using the Hypertext Transfer Protocol over a computer network, and is used to send data to a receiving server to create/update a resource.

- 2) configure HELO for all wireless 9-1-1 calls originating from their HELO-provisioned networks, as follows:
  - i. send handset-based location results to PSAPs using the existing Phase II configuration;
  - ii. maintain the current ICLU process (no Phase II configuration changes are required); and
  - iii. ensure that 9-1-1 calls from HELO-enabled handsets without a data plan will support the delivery of HELO location.

### **Matters for further consideration**

52. With respect to the ESWG's recommendations regarding matters for further consideration, set out in section 7 of the report, the Commission requests the ESWG to

- 1) determine if facilities-based WSP networks can deliver location data to applicable aggregation points for 9-1-1 calls from ELS-enabled handsets that do not have a data plan, and report to the Commission by **30 December 2023**;
- 2) determine if additional processing is required to handle multi-operator core network arrangements between two WSPs and report to the Commission by **30 December 2023** (this will be added to the pre-production test cases);
- 3) determine, after AML is launched, based on the data from a one-year period, whether expected results are being delivered, and, should the data be negative, report to the Commission by **30 September 2025** on the following questions:
  - a. Is HTTPS working well (i.e., is data SMS<sup>11</sup> required)?
  - b. Have any issues arisen with the lack of network-based validation checking for HELO calls, such as spoofing incidents or misconfigured cell site/sector problems?

53. The Commission reiterates its request, set out in Telecom Decision 2021-210, that the ESWG continue to monitor and report regarding (i) technical and standards developments in the wireless industry that could lead to further improvement in the accuracy of location information, including those that impact non-Android- and non-

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<sup>11</sup> Data SMS is a text messaging solution that enables users of mobile telephones to exchange short text messages over a wireless data network. It is a best-efforts service that provides bandwidth on a first-come, first-served basis.

iOS-based handsets, or new devices that may appear on the market; and (ii) the following questions:

- a) When will it be possible to implement the z-axis (vertical) coordinate in Canada? The ESWG plans to propose a trial to help determine the parameters required to use z-axis in Canada. As well, PSAPs will need to work with their vendors to determine what CAD [computer aided design] and mapping changes (if any) are required to support delivery and display of z-axis data. The ESWG will continue to monitor developments around the world and file a future report when the technology is ready for deployment in Canada.
- b) Can parameters beyond a circle radius of uncertainty be supported? The current WSP location technology already supports native shapes such as circles, polygons, arc bands, and elliptical shapes, which are converted to a circle for uniform display at PSAPs today. There is a need to determine when PSAPs will have the ability to display, i.e., map, different shapes (perhaps within two to four years).

## Policy directions

54. In accordance with section 1 of the 2023 Policy Direction,<sup>12</sup> the Commission considers that approval of the report, and the recommendations it contains, will advance the policy objectives set out in paragraphs 7(g) and (h) of the *Telecommunications Act*.<sup>13</sup> The report's recommendations, as modified by the Commission, represent a competitively neutral and symmetrical approach to implementing NG9-1-1, and specifically handset-based location, affecting all facilities-based WSPs.
55. The ESWG's report addresses technical matters related to improving the ability to accurately locate those who call for emergency services on wireless devices, as is the case with the majority of emergency calls. The Commission considers that by directing WSPs to implement the various measures outlined in the report's recommendations and by requesting the ESWG to complete and report on the work associated with the matters for further consideration, all in support of the implementation of wireless handset-based location technology, the Commission will be better ensuring the proper functioning of 9-1-1 networks and thereby promote consumer interests.

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<sup>12</sup> *Order Issuing a Direction to the CRTC on a Renewed Approach to Telecommunications Policy*, SOR/2023-23, 10 February 2023

<sup>13</sup> The cited policy objectives are: 7(g) to stimulate research and development in Canada in the field of telecommunications and to encourage innovation in the provision of telecommunications services; and 7(h) to respond to the economic and social requirements of users of telecommunications services.

56. Furthermore, the Commission considers that the recommendations in the report support key objectives set out in paragraphs 2(f) and (g) of the 2023 Policy Direction.<sup>14</sup> In approving the recommendations in the report the Commission is promoting innovation, because it is exercising leadership in a coordinated nationwide transition to NG9-1-1 networks and services, to the benefit, first and foremost, of all Canadians. As technology and consumer expectations evolve, it is imperative that 9-1-1 networks maintain the path towards NG9-1-1, and that innovations in this field remain responsive to the public safety needs of Canadians.

Secretary General

### **Related documents**

- *CISC Emergency Services Working Group – Changes to dates and direction set out in Telecom Decision 2021-210 regarding the implementation of handset-based location technology*, Telecom Decision CRTC 2022-237, 2 September 2022
- *CISC Emergency Services Working Group – Consensus letter on handset-based location technology implementation for 9-1-1 in Canada – Suspension of deadlines*, Telecom Decision CRTC 2022-54, 25 February 2022
- *CISC Emergency Services Working Group – Consensus report ESRE0092 related to handset-based location implementation*, Telecom Decision CRTC 2021-210, 23 June 2021
- *CISC Emergency Services Working Group – Consensus report ESRE0086 regarding dispatchable location from originating networks*, Telecom Decision CRTC 2020-373, 12 November 2020
- *9-1-1 action plan*, Telecom Regulatory Policy CRTC 2014-342, 25 June 2014; as amended by Telecom Regulatory Policy CRTC 2014-342-1, 30 January 2015
- *Implementation of wireless Phase II E9-1-1 service*, Telecom Regulatory Policy CRTC 2009-40, 2 February 2009
- *Conditions of service for wireless competitive local exchange carriers and for emergency services offered by wireless service providers*, Telecom Decision CRTC 2003-53, 12 August 2003

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<sup>14</sup> The cited policy objectives are: 2(f) to enable innovation in telecommunications service, including new technologies and differentiated service offerings; and 2(g) to stimulate investment in research and development and in other intangible assets that support the offer and provision of telecommunications services.

## **Appendix to Telecom Decision CRTC 2023-235**

### **Results from the proof of concept regarding advanced mobile location configuration**

In Telecom Decision 2021-210, the Commission requested the Emergency Service Working Group of the CRTC Interconnection Steering Committee (ESWG) to undertake an assessment of matters for further consideration regarding the implementation of handset-based location technology, as set out in paragraph 48 of that decision. Below are the outcomes for items 1) a) to 1) i).

#### **Item 1) a)**

The ESWG will work with wireless service providers (WSPs) to confirm how HTTPS<sup>15</sup> will be allowed from handsets without a data plan.

#### **RESULTS:**

A data plan will initially be required for Emergency Location Services (ELS)-enabled handsets, but not for Hybridized Emergency Location (HELO)-enabled handsets. The ESWG will follow up to determine if anything can be changed so that HTTPS can be supported on ELS-enabled handsets without a data plan.

#### **Item 1) b)**

The ESWG will work with WSPs to determine if Data SMS<sup>16</sup> is required in addition to HTTPS for the delivery of ELS location results.

#### **RESULTS:**

HTTPS worked during the laboratory testing. An assessment as to whether HTTPS coverage is working well, and whether Data SMS is also required, is identified as a matter for further consideration and will be undertaken following the implementation of ELS.

#### **Item 1) c)**

The ESWG will work with WSPs to determine if the ELS configuration, validation process, and the best location result calculation (i.e., algorithm) perform as expected, subject to an agreed-upon test plan.

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<sup>15</sup> HTTPS is a secure communication using the Hypertext Transfer Protocol over a computer network, and is used to send data to a receiving server to create/update a resource

<sup>16</sup> Data SMS is a text messaging solution that enables users of mobile telephones to exchange short text messages over a wireless data network. It is a best-efforts service that provides bandwidth on a first-come, first-served basis.

**RESULTS:**

These tests were successfully undertaken in the laboratory environment and the ELS configuration, including the validation process and best location result calculation, was confirmed.

**Item 1) d)**

The ESWG will work with WSPs to determine if the HELO configuration, validation process, and location result calculation at the handset perform as expected, subject to an agreed-upon test plan.

**RESULTS:**

Testing and analysis were undertaken during the proof-of-concept process using the previously arranged control plane delivery mechanism between Apple and most facilities-based WSPs. It was confirmed that delivery using the control plane can be formally implemented in Canada. However, only one location is delivered using this mechanism; therefore, a validation process similar to that used for ELS is not applicable to HELO.

**Item 1) e)**

The ESWG will work with Google to confirm a single aggregation implementation for Canada that sends the ELS location data simultaneously to each of the designated next generation 9-1-1 (NG9-1-1) network providers.

**RESULTS:**

The proof of concept confirmed Bell Canada and TELUS Communications Inc. (TCI) as the ELS aggregators for Canada. The ESWG also reviewed and assessed the need for a third aggregation point, i.e., Saskatchewan Telecommunications, and determined that this level of redundancy is not required, nor would it be supported by Google.

**Item 1) f)**

The ESWG will confirm the process and interconnection required to push the ELS location results delivered from Google to the applicable WSP.

**RESULTS:**

During the proof of concept, various interconnection arrangements were put in the test cases. The ESWG proposes interconnection using the existing emergency services Internet Protocol network (ESInet) network-to-network interfaces (NNIs) provided by Bell Canada and/or TCI in order to avoid the cost and scheduling required for new interconnections.

**Item 1) g)**

The ESWG will determine if additional processing is required to handle multi-operator core network arrangements between two WSPs.

RESULTS:

Additional testing during the proposed pre-production testing is required and is proposed as a new matter for consideration.

**Item 1) h)**

The ESWG will confirm how licencing with Google, encryption and decryption, and the privacy of ELS location data will be addressed in the arrangement described in item 1) e).

RESULTS:

The confidential aggregation agreements that Bell Canada and TCI signed with Google address the licencing and security requirements. The ELS location data is transient over the ELS aggregator networks, and is stored and disclosed as required by the public safety answering point that processes the call, as is done under existing Enhanced 9-1-1 requirements.

**Item 1) i)**

The ESWG will determine the implications for telecommunications service providers (i.e., the enhancements to existing platforms required) of the arrangement described in item 1) e).

RESULTS;

There are impacts on existing NG9-1-1 network provider platforms which will be covered in the applicable NNI. Any changes regarding future tariffs will be filed directly with the Commission as needed.