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

Telecom Decision CRTC 2020-373

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CISC Emergency Services Working Group – Consensus report ESRE0086 regarding dispatchable location from originating networks

*The Commission **approves**, with a modified timeline for implementation, the recommendations made in the CRTC Interconnection Steering Committee's Emergency Services Working Group's consensus report ESRE0086b related to automatic emergency location determinations. The Commission **directs** telecommunications service providers, effective on the date they are required to have their networks ready to support NG9-1-1 services, to deliver to public safety answering points the most accurate dispatchable location available when so requested, and to adhere to the timing and response times detailed in the appendix to this decision.*

Background

1. Canadians currently have access to either basic 9-1-1 or enhanced 9-1-1 service through wireline, wireless, and voice over Internet Protocol (VoIP) telephone services wherever a 9-1-1 call centre, also known as a public safety answering point (PSAP), has been established.[1] In the future, Canadians will have access to next-generation 9-1-1 (NG9-1-1) services as described in Telecom Regulatory Policy 2017-182.

2. At present, when a caller dials 9-1-1, the call travels from the network from which it was placed (the originating network)[2] to the local specialized 9-1-1 network. The 9-1-1 network then determines, based on the caller's telephone number, which PSAP serves the area from which the emergency request originated and routes the call accordingly, along with associated caller information such as location and telephone number. For wireline calls, the telephone number is the number assigned to the calling line; for wireless calls it is the emergency services routing digit.[3] Nomadic

[1] Basic 9-1-1 service enables callers to connect to 9-1-1 operators, who dispatch the appropriate emergency responders. Enhanced 9-1-1 service includes basic 9-1-1 service but also automatically provides 9-1-1 operators with ancillary information, such as the telephone number and location of the caller.

[2] Originating networks include traditional wireline, wireless, and local VoIP telephony networks.

[3] The emergency service routing digit is a ten-digit North American Numbering Plan number that uniquely identifies a base station, cell site, or sector and is used to route wireless emergency calls through the network.

VoIP calls are routed to a third-party operator who then routes them to the appropriate PSAP.[4] The PSAP then dispatches emergency responders as required.

3. Each active wireline phone number is associated with a valid civic address found in the Master Street Address Guide/Street Address Guide (MSAG/SAG),[5] if the MSAG/SAG has been activated by a telecommunications service provider (TSP). PSAPs typically have a standard operating procedure that includes confirmation of the location of the caller's emergency for all types of 9-1-1 calls. Confirmation is necessary because the location of the emergency may be different from the location of the caller.

4. Location information is generally obtained from the originating network. Its availability and characteristics vary depending on the type of network from which the call originates.[6] With the introduction of NG9-1-1 services and the implementation of enhanced, handset-based methods of determining location in mobile telecommunications networks, location information will be used for two distinct purposes:

    - to route wireless 9-1-1 calls to the appropriate/designated PSAP, where it may be used by the PSAP communicator in the location verification process; and

    - to dispatch emergency responders to the verified location of the emergency incident (dispatchable location).

5. For NG9-1-1 services, a location information server (LIS) will provide the most current device location for purposes of determining the dispatchable location. An additional data repository (ADR) will provide information over and above caller location, such as data about the call, the caller, or the location. In Telecom Regulatory Policy 2019-66, the Commission set out the roles and responsibilities to be imposed on TSPs and incumbent local exchange carriers for the provision of LIS and ADR functionalities, and asked the CRTC Interconnection Steering Committee (CISC) to provide recommendations regarding the associated technical and operational requirements.

6. In Telecom Regulatory Policy 2017-182 and Telecom Decision 2019-353, the Commission set out a framework for the implementation of NG9-1-1 services (the

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[4] Nomadic VoIP service is provided over the Internet and enables callers to access telephone services using any high-speed Internet connection from any location. Nomadic VoIP service provides basic 9-1-1 service because there is no fixed address to provide to 9-1-1 operators.

[5] The MSAG/SAG is a database of street names and house number ranges; it defines emergency service zones within a community and the emergency service numbers associated to them in order to enable routing of 9-1-1 calls to the proper PSAP.

[6] In Canada, the five primary sources of location are fixed networks (fixed wireless and wireline), Wi-Fi/access points, wireless networks, Nomadic VoIP/third party emergency operator services, and NG9-1-1 additional location data.

NG9-1-1 framework) with various milestones and associated deadlines. However, in a Commission letter to 9-1-1 stakeholders dated 8 April 2020, the Commission suspended, in light of the COVID-19 pandemic, the deadlines established in the NG9-1-1 framework, set out provisional dates for the milestones in a preliminary view, and indicated that it would launch a proceeding to formally re-establish the dates. The Commission subsequently issued Telecom Notice of Consultation 2020-326 for that purpose.

Report

7. On 17 April 2020, the CISC Emergency Service Working Group (ESWG)[7] submitted the following consensus report (the report) for Commission approval:

    - *Dispatchable Location from Originating Networks,* 12 September 2019 (ESRE0086b)

8. 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.

9. The ESWG initiated the report in response to recommendation #5 from the ESWG report ESRE0070. The recommendation stated that automatic location determination solutions were to be addressed under a separate task identification form (TIF).

10. The report concerns matters related to automatic emergency location determinations that should make reliable location information, which is of paramount importance for emergency services, more readily available.

11. The report is based on the views of NG9-1-1 stakeholders, including wireless service providers (WSPs), NG9-1-1 network providers, and PSAPs. ESWG participants submitted eight contributions. Participants reached consensus on the recommendations.

12. The report describes dispatchable location as the best location available at the time of a request and at the time of the requisite subsequent calculation, in the best format available, either a pre-defined civic format,[8] or geodetic format,[9] or both. The ESWG indicated that the determination of dispatchable location is dependent on the source of

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[7] The ESWG is a working group under the CISC that deals with technical and operational issues related to 9-1-1 service in Canada.

[8] Civic location is a set of one of more civic address elements that are used in conjunction with each other, and in accordance with a known ruleset to designate a specific place within a region of geography, or a region of geography by itself.

[9] Geodetic location is a geographic coordinate set of values describing a point or shape within a defined geodetic system. The World Geodetic System datum, a coordinate system of the Earth, is the world standard for providing location through the use of longitude and latitude coordinates (two-dimensional: X for longitude and Y for latitude), and an associated region of uncertainty computed at a given confidence factor.

the location data, and, for wireless calls, on the time it takes to make a computed location determination (up to 30 seconds), and noted that it contains two components:

- initial location data, used to route the call to the appropriate/designated primary PSAP, and, when required, to transfer the call to an applicable PSAP; and

- system-derived location data and/or additional data such as supplemental address information.

13. The ESWG reviewed possible NG9-1-1 location requests and results timing parameters. The report recommends a best practice for PSAP location queries, shown in the appendix to this decision. These parameters will be validated by the applicable parties during forthcoming NG9-1-1 Voice implementation trials. [10,11]

Recommendations of the report

14. The report recommends that the Commission direct TSPs to

    i. deliver the best location available, as defined in section 3.1.2 of the report, to the PSAP call handling functional element when requested to do so either automatically or manually; and

    ii. adhere to the applicable timing and response times detailed in the appendix to this decision, except in the case of fixed services, which deliver a best location with a 9-1-1 call.

15. The ESWG requested that the recommendations be implemented as early as possible, but no later than 30 June 2020, the date by which networks were initially required to be ready to support NG9-1-1 Voice services in accordance with the NG9-1-1 framework.

16. The ESWG also identified matters for further consideration. These include:

- the question of whether a national or regional database, equivalent to the national emergency address database used in the U.S. (NEAD),[12] is required for types of network access other than Wi-Fi access points;

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[10] NG9-1-1 Voice is a service that enables the end-to-end provision of an IP-based 9-1-1 voice call, as defined under the NENA i3 standard. The service is expected, at a minimum, to provide the capabilities and functions of 9-1-1 services in place today, where technically feasible, including functions such as conference calling and the ability to call back the person requesting emergency services following a disconnection.

[11] NG9-1-1 Voice implementation trials, which will include participants from PSAPs, TSPs, and NG9-1-1 service providers in certain geographical areas, are the focus of ESWG TIF 88, *NG9-1-1 Voice Trial Logistics.*

[12] The NEAD is an American database that stores dispatchable location information such as street address, floor identifier, suite, apartment, etc. This information is stored in the event that there is a query for

- additional consideration of LIS/ADR with regard to technical and operational requirements that are related to dispatchable location;

- additional consideration of the introduction of new technologies to improve wireless location accuracy in Canada, looked at in CISC consensus report ESRE0064, *Wireless E9-1-1 Phase II Location Accuracy Requirements in Canada,* and in particular the implications for the delivery of best location to PSAPs;

- validation of the functions and processes related to location determination, acquisition, and routing that will be the subject of the NG9-1-1 Voice implementation trials, and assessment of the technical and operational implications of those functions and processes for dispatchable location; and

- assessment of the implications of multi-line telephone system location determination for dispatchable location.

17. The ESWG noted that it will give priority to the consideration of those matters, together with additional matters that may arise in discussions or through the NG9-1-1 Voice implementation trials, and present recommendations to the Commission, as appropriate, to support implementation of mandated requirements within the specified timelines.

Commission's analysis and determinations

18. 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.[13]

19. The Commission agrees with the intent of the recommendations. However, the timeline requested for implementation of the recommendations should be modified to reflect the suspension of relevant deadlines in the Commission letter of 8 April 2020. In that letter, the Commission stated a preliminary view that the date by which NG9-1-1 network providers and originating network providers must have their networks ready to support NG9-1-1 Voice service be re-established as 30 March 2021.

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dispatchable location information from an originating network in support of an individual emergency call. On 14 February 2020, the NEAD administrator, NEAD LLC, publicly notified the Federal Communications Commission that the NEAD had been fully decommissioned and would not be made available to the public safety community.

[13] Telecom Regulatory Policy CRTC 2017-182, paragraph 24

20. The Commission notes that in response to a request for information,[14] the chairperson of the ESWG indicated that aligning the implementation of the recommendations with the date by which networks must be prepared to support NG9-1-1 Voice services would ensure that WSPs and PSAPs are able to adhere to the timing parameters included in the appendix to this to decision. These timing parameters are critical to ensuring the timely transfer of accurate location data for each applicable 9-1-1 call, ultimately contributing to the successful launch of NG9-1-1 Voice services.[15]

21. With regard to the matters that the report identifies for further consideration, the Commission notes that several of them are specific to the work of other TIFs already underway, and encourages the ESWG to assess the impact of the present decision on those TIFs.

22. In light of all of the above, the Commission **approves** the recommendations contained in the report, with a modified timeline for implementation, and **directs** TSPs, starting on the same day that NG9-1-1 network providers and original network providers are required to have their networks ready to support NG9-1-1 voice services, whether 30 March 2021 or a date the Commission may set in the proceeding it has initiated with Notice of Consultation 2020-326, to

    i. deliver the most accurate dispatchable location available, as defined in the report,[16] to the PSAP call handling functional element when so requested, either automatically or manually, specifically the geodetic location, the validated civic location, or both, and comprising:
        - initial location data, and
        - system-derived location and/or additional data such as supplemental address information; and

    ii. adhere to the applicable timing and response times detailed in the appendix to this decision, except in the case of fixed services, which deliver a best location with a 9-1-1 call.

23. The Commission encourages PSAPs to implement and use the NG9-1-1 system location request timing configuration, the detailed technical specifications, and the operational best practices shown in the appendix.

24. Furthermore, the Commission requests the ESWG to address the following issues, identified as matters for further consideration in the report:

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[14] Commission Letter, RE: *CISC Emergency Services Working Group Consensus Report ESRE0086b Dispatchable Location from Originating Networks* – Request for Information, 23 July 2020

[15] ESWG letter to Commission, RE: Request for Information from the CISC ESWG Regarding our filed Report ESRE0086b – Dispatchable Location, 29 July 2020

[16] Section 3.2.1

- the question of whether a national or regional database, equivalent to the NEAD, is required for types of network access other than Wi-Fi access points;
- additional consideration of LIS/ADR with regard to technical and operational requirements related to dispatchable location;
- additional consideration of the introduction of new technologies to improve wireless location accuracy in Canada, looked at in CISC consensus report ESRE0064, *E9-1-1 Wireless Phase II Location Accuracy Requirements in Canada*, and in particular the implications for the delivery of best location to PSAPs;
- validation of the functions and processes related to location determination, acquisition, and routing that will be the subject of the NG9-1-1 Voice implementation trials, and assessment of the technical and operational implications of those functions and processes for dispatchable location; and
- assessment of the implications of multi-line telephone system location determination for dispatchable location.

Policy Directions

25. In accordance with subparagraph 1(b)(i) of the 2006 Policy Direction,[17] the Commission considers that approval of the report and the recommendations will advance the policy objectives set out in paragraphs 7(g) and (h) of the Telecommunications Act.[18]

26. The 2019 Policy Direction,[19] which complements the 2006 Policy Direction, states that the Commission must consider and specify how its determinations promote competition, affordability, consumer interests, or innovation, as applicable. The report addresses technical matters related to the accurate determination of caller location for emergency services, and to the security of NG9-1-1 networks and the networks with which they interconnect. The Commission considers that implementation of the various measures outlined in the report will ensure the proper functioning of critical networks, and thereby promote consumer interests. The Commission's approval of the recommendations, with a modified timeline for implementation, promotes innovation and provides leadership in the coordination of the nationwide transition to NG9-1-1 networks and services, to the benefit of all Canadians. As technology and consumer expectations change, the Commission finds it imperative that 9-1-1

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

[18] 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.

[19] *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

networks continue to 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

- *Call for comments – Establishment of new deadlines for Canada's transition to next-generation 9-1-1*, Telecom Notice of Consultation CRTC 2020-326, 4 September 2020

- *RE: Suspension of Next-Generation 9-1-1 deadlines due to COVID-19,* Telecom – Commission Letter, 8 April 2020

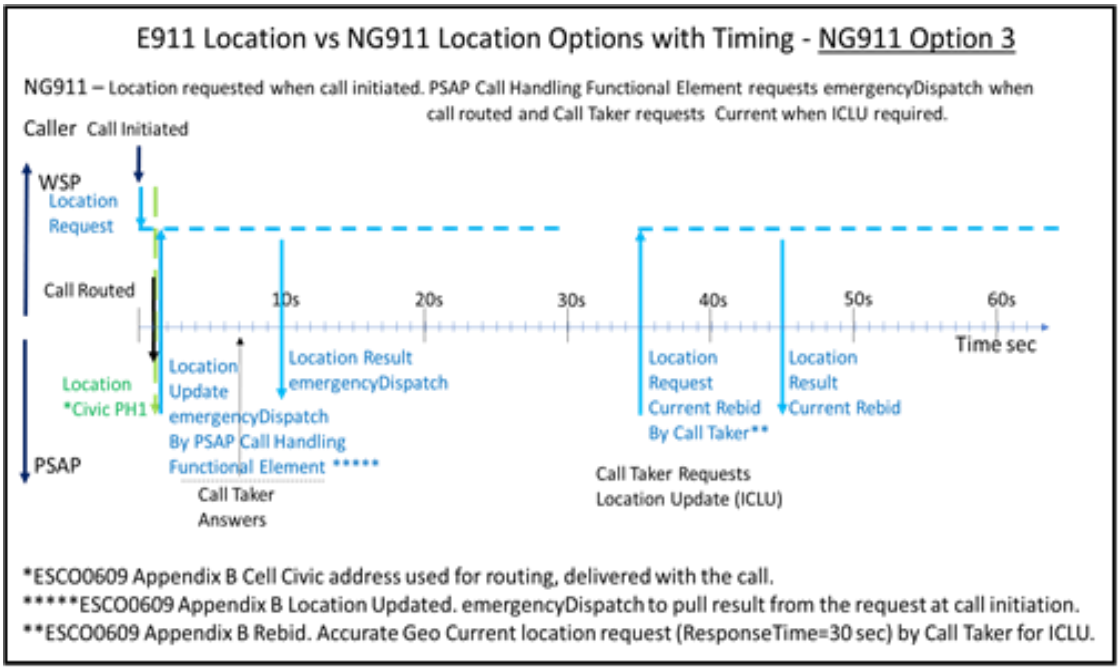
- *CISC Emergency Services Working Group – Consensus report on matters related to compatibility, reliability, resiliency, and security for next-generation 9-1-1*, Telecom Decision CRTC 2019-353, 22 October 2019

- *Next-generation 9-1-1 network design efficiencies,* Telecom Regulatory Policy CRTC 2019-66, 7 March 2019

- *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

Appendix to Telecom Decision CRTC 2020-373

Recommended NG9-1-1 Location Request Timing



When the call is initiated, a location request is provided with the extension parameter "emergencyRouting". The initial static civic address is delivered with the call as a reference for purposes of routing the call to the proper PSAP. This occurs at responseTime = 0 seconds.

The PSAP call handling functional element requests a location update from the location server as soon as the call handling functional element is aware of the call. The location result sent to the PSAP includes the best location as well as the uncertainty and confidence factor, with the extension parameter "emergencyDispatch".

When a PSAP call taker requests a subsequent high accuracy result, known as a location request current rebid, an in-call location update (ICLU) is provided. This can only occur after responseTime = 30 seconds. The PSAP must wait for a response prior to initiating subsequent requests, otherwise an error message will be returned by the WSP.