



Telecom Decision CRTC 2023-339

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CISC Emergency Services Working Group – Consensus report – Updates to the wireless location accuracy benchmarks

Summary

The Commission considers that its determinations in this decision will help ensure that Canadians have access to effective emergency services, which is integral to a world-class communications system. This involves setting and updating wireless location accuracy benchmarks for wireless service providers (WSPs) to meet when responding to 9-1-1 calls. It also emphasizes transparency by requesting WSPs to report annually on their performance and describe their processes for identifying and correcting cell site/sector misconfigurations. Ultimately, the Commission's goal is to continuously improve wireless location accuracy to benefit all Canadians and maintain high standards for emergency services.

The Commission **approves** the recommendations set out in the Emergency Services Working Group (ESWG) consensus report ESRE0103 – *Recommended Updates to the Wireless Location Accuracy Benchmarks Approved in Telecom Decision 2022-91*, and

- **directs** WSPs to continue to use minimum and target thresholds set out in Telecom Decision 2022-91 as the basis for measuring location accuracy performance for period 9 (1 January 2022 to 31 December 2022) and subsequent reporting periods;
- **directs** WSPs to use the revised minimum yield threshold of 97% as the basis for measuring location accuracy performance for period 9 and subsequent reporting periods;
- **directs** WSPs to describe in detail to the Commission the process in place to quickly identify and correct cell site/sector misconfigurations, along with associated timelines and communications to stakeholders, and to provide this information annually as part of the wireless location accuracy reporting, starting in period 10 (1 January 2023 to 31 December 2023);
- **requests** the ESWG to continue to annually assess WSPs' wireless location accuracy results and to report to the Commission if and when it deems any adjustment to the thresholds is appropriate with a view to promoting continued improvement to the benefits of Canadians; and

- **requests** the ESWG to continue to monitor and report on technical and standards developments in the wireless industry that could lead to improved wireless location accuracy results.

Background

1. Effective access to emergency services is critical to the health and safety of citizens and is an important part of ensuring that Canadians have access to a world-class communications system. In Telecom Decision 2003-53, the Commission mandated the provision of Phase I location information to public safety answering points (PSAPs). In Telecom Regulatory Policy 2009-40, the Commission mandated the provision of wireless Enhanced 9-1-1 (E9-1-1) Phase II and imposed certain confidence levels and uncertainty.¹
2. In Telecom Regulatory Policy 2014-342, the Commission set out its 9-1-1 action plan, which included key initiatives aimed at enhancing Canadians' access to existing 9-1-1 services. One of these initiatives was to improve the 9-1-1 caller location information provided to the PSAPs that receive 9-1-1 calls.
3. In Telecom Decision 2014-415, the Commission imposed minimum and target thresholds that wireless service providers (WSPs) use to measure wireless 9-1-1 location accuracy performance. The Commission also imposed a minimum yield threshold.²
4. These thresholds, consisting of the minimum and target thresholds and the yield thresholds, are known as benchmarks for wireless location accuracy. The minimum thresholds are the point below which a wireless service provider is outside the normal range of performance and there needs to be an improvement. The target thresholds are the mean performance of WSPs (50% of WSPs are below this figure and 50% are above) and are an aspirational target to which all WSPs should strive.
5. The Commission, through a series of decisions,³ subsequently established a wireless 9-1-1 location accuracy monitoring process. The objective of this process is to better understand the degree of accuracy of the location information WSPs send to PSAPs during a 9-1-1 call to inform future improvements.
6. In Telecom Decision 2015-255, the Commission imposed, among other things, the obligation for WSPs to file annual reports including an analysis of their performance results, explanations for the cases where they are not meeting the benchmarks, and their action plan to resolve any related issues. In Telecom Decision 2017-119, the Commission also requested that the Emergency Services Working Group (ESWG)

¹ "Uncertainty" is an estimate of the horizontal error between the actual handset position and the latitude/longitude calculated by the location system, at a given level of confidence. "Confidence" indicates how reliable or confident the system is regarding the estimate.

² The yield is the percentage of successful caller location coordinates sent to PSAPs by a given carrier, out of the total number of caller location coordinates requests for that carrier.

³ Including Telecom Decisions 2015-255, 2017-119, 2019-120, and 2022-91.

conduct assessments of the identified thresholds to determine whether they should be adjusted.

7. Eight sets of threshold results have previously been filed with the Commission by WSPs, dating back to 2014. As a result, the original thresholds were adjusted upwards by the Commission on three occasions.⁴ The latest such adjustments were approved in Telecom Decision 2022-91.

The latest report

8. On 9 March 2023, the ESWG filed consensus report ESRE0103 – *Recommended Updates to the Wireless Location Accuracy Benchmarks Approved in Telecom Decision 2022-91* (the Report), outlining its new findings and recommendations regarding the wireless 9-1-1 location accuracy thresholds. The recommendations were agreed upon by key stakeholders, including WSPs and PSAPs participating in the ESWG.
9. The ESWG highlighted the impact of misconfigured cell site/sectors⁵ in the accuracy of location data provided with 9-1-1 calls. The ESWG also argued that the implementation of 5G [fifth-generation] wireless will bring thousands of new cell sites/sectors, and the potential for misconfigurations will also increase. The current reporting does not expressly indicate that all facilities-based WSPs have processes in place to quickly identify and correct cell site/sector misconfigurations.
10. The ESWG assessed the current location accuracy minimum and target thresholds based on the Commission’s aggregated results from periods 7 and 8.⁶ The latest results demonstrated that the WSPs were exceeding the minimum required accuracy thresholds and were, for the most part, attaining the target thresholds. As a result, the ESWG made the following recommendations:

- That the 2021 benchmarks be retained as the reporting criteria for the WSP report period 9⁷, as follows:

	<150 m for Rural / Small PSAPs	<150 m for Large / Metro PSAPs	<1000 m for Rural / Small PSAPs	<1000 m for Large / Metro PSAPs
Minimum threshold	65%	65%	75%	86%

⁴ Telecom Decisions 2017-119, 2019-120, and 2022-91

⁵ An example of a misconfigured cell site/sector is when an antenna points to an antenna coverage area that does not align with a PSAP serving area.

⁶ Reporting period 7 (1 January 2020 to 31 December 2020) and reporting period 8 (1 January 2021 to 31 December 2021). The WSPs submit their wireless location accuracy results to the Commission annually after each period.

⁷ Reporting period 9 (1 January 2022 to 31 December 2022)

Target threshold	76%	74%	87%	93%
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- That the minimum yield threshold be increased from 95% to 97% for the 2022 reporting period and continuing thereafter.
- That the annual wireless location accuracy reporting process, starting in period 10⁸, include a requirement for each reporting WSP to confirm in confidence with the Commission that it has a process in place to quickly identify and correct cell site/sector misconfigurations.
- That the ESWG continue the process of assessing the results of the Commission’s aggregated results, and as needed, file future reports with the Commission recommending adjustments to the thresholds.

Commission’s analysis

11. The Commission notes that the ESWG completed an assessment of handset-based location technology leading to Telecom Decision 2022-237 which is expected to improve wireless location accuracy, especially indoors. Once handset-based location technology is implemented, the Commission expects the ESWG will consider revising the minimum and target thresholds. The Commission analyzed the ESWG’s recommendation to maintain the current minimum and target thresholds until the handset-based location technology is implemented. The national wireless location accuracy results over the last three periods have begun to level off based on the current location technology available, where the WSPs exceeded the minimum required accuracy thresholds and mainly attained the target thresholds. Therefore, the benchmarks in Telecom Decision 2022-91 should be retained as the reporting criteria for the WSP reports for period 9 and subsequent reporting periods.
12. The ESWG developed the newly proposed minimum yield threshold based on aggregated results for periods 7 and 8 with the understanding that WSPs should reasonably be able to meet the minimum threshold for upcoming periods. In period 8, the national and provincial averages were above the newly proposed minimum yield threshold, so the minimum yield threshold should be raised from the original 95%. The minimum yield threshold has never been updated since it was set in Telecom Decision 2014-415, and the yield results have remained consistently higher than the current minimum yield threshold at national levels. At an individual PSAP level, there are still some PSAPs that do not meet the current minimum 95% yield. Increasing the yield from 95% to 97% is setting a higher standard at the

⁸ Reporting period 10 (1 January 2023 to 31 December 2023)

individual PSAP level and will indicate to the Commission where there are issues specific to those few individual PSAPs.

13. The Commission analyzed the proposed minimum yield threshold by comparing it with the results from period 8 and is satisfied with the ESWG's proposal. When comparing the proposed minimum yield threshold with past results, it does not materially impact the number of WSPs that potentially cannot meet the minimum yield threshold. This ensures that the Commission would receive notice when legitimate issues arise within the WSPs results that cause them to drop below the minimum yield threshold.
14. The Commission considers that the addition of WSPs confirming and describing in detail with the Commission that they have processes in place to quickly identify and correct cell site/sector misconfigurations is beneficial, both in terms of the monitoring process and in improving wireless location accuracy in Canada.
15. The Commission also considers that the ESWG monitoring process is working well and should continue, given the action undertaken by WSPs to improve their results following the publication of previous results and the increase in the minimum yield threshold proposed for period 9.

Conclusion

16. In light of all of the above, the Commission **approves** the recommendations set out in the Report, and:
 - **directs** WSPs to continue to use minimum and target thresholds set out in Telecom Decision 2022-91 as the basis for measuring location accuracy performance for period 9 and subsequent reporting periods;
 - **directs** WSPs to use the revised minimum yield threshold of 97% as the basis for measuring location accuracy performance for period 9 and subsequent reporting periods;
 - **directs** WSPs to describe in detail to the Commission the process in place to quickly identify and correct cell site/sector misconfigurations, along with associated timelines and communications to stakeholders, and to provide this information annually as part of the wireless location accuracy reporting, starting in period 10;

- **requests** the ESWG to continue to annually assess WSPs' wireless location accuracy results and to report to the Commission if and when it deems any adjustment to the thresholds is appropriate with a view to promoting continued improvement to the benefits of Canadians; and
- **requests** the ESWG to continue to monitor and report on technical and standards developments in the wireless industry that could lead to improved wireless location accuracy results.

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 report ESRE0094 - Updates to the wireless location accuracy benchmarks set out in Telecom Decision 2019-120, Telecom Decision CRTC 2022-91, 29 March 2022*
- *CISC Emergency Services Working Group - Consensus report recommending updates to the wireless 9-1-1 caller location accuracy thresholds originally approved in Telecom Decision 2017-119, Telecom Decision CRTC 2019-120, 26 April 2019*
- *CISC Emergency Services Working Group - Consensus report regarding updates to the wireless 9-1-1 caller location accuracy thresholds, Telecom Decision CRTC 2017- 119, 28 April 2017*
- *CISC Emergency Services Working Group – Consensus report on monitoring the wireless 9-1-1 caller location accuracy performance of wireless carriers, Telecom Decision CRTC 2015-255, 15 June 2015*
- *CISC Emergency Services Working Group - Consensus report regarding wireless enhanced 9-1-1 Phase II location accuracy requirements, Telecom Decision CRTC 2014-415, 6 August 2014*
- *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; as amended by Telecom Decision CRTC 2003-53-1, 25 September 2003*