

August 23, 2021

Ms. Josette Gallant
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Innovation, Science and Economic Development Canada
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(Submitted by email spectrumengineering-genieduspectre@ised-isde.gc.ca)

Subject: ***Consultation on Amendments to SRSP-520, Technical Requirements for Fixed and/or Mobile Systems, Including Flexible Use Broadband Systems, in the Band 3450-3650 MHz***

Dear Ms. Gallant,

1. On August 6, 2021, the Department initiated a very short 15-day technical consultation on proposed amendments to Standard Radio System Plan SRSP-520, *Technical Requirements for Fixed and/or Mobile Systems, Including Flexible Use Broadband Systems, in the Band 3450-3650 MHz*. On August 12, 2021, the RABC requested that the Department extend the filing date to October 21, 2021, to allow the RABC and its members to provide a meaningful response to the consultation. On August 12, 2021, ISED denied the request of the RABC. The Department explained that despite concerns regarding possible implications for 3500 MHz deployments, the safety of Canadians is of paramount importance. The Department explained further that it is critical that technical rules are in place to protect radio altimeters from potential interference, without delaying deployments of flexible use systems following the recent 3500 MHz auction.
2. The RABC agrees that the safety of Canadians is paramount and understands that the Department needs to make any updates to the Standard prior to the first new flexible use deployments at 3500 MHz. As the Department noted in its consultation document, “Spectrum regulators around the world, including ISED, have recently become aware of studies that have shown a possibility of interference to radio altimeters from signals

outside their band of operation, which could include signals from future flexible use 5G systems in 3500 MHz spectrum around airports.”¹

3. The RABC understands that the Department’s proposal to define exclusion and protection zones around major airports closely resembles the precautionary actions taken by ANFR in France in the vicinity of airports and helipads to protect radio altimeters from potential interference resulting from the deployment of 5G systems in the 3490 – 3800 MHz range, a frequency range greater than that covered by SRSP-520 (3450 – 3650 MHz). Such rules are proposed to avoid risks to the safety of flights when aircraft are at the final stage of their approach to an airport and in close proximity to the ground, particularly in poor weather or low visibility situations.
4. The RABC understands further that the Department’s proposal to restrict uptilt for outdoor antenna systems nationally is a precautionary action to reduce interference to aircraft, which mainly rely on the radio altimeter to perform landing procedures in certain situations where ground-based navigation aids are not available (e.g., landing on helipads in urban areas).
5. The key challenge for the RABC is to review and comment on the proposed changes during a limited 15-day consultation. The consultation document released by the Department reads more like a notification to industry and stakeholders, rather than a process to receive meaningful input regarding the updated standard. The Department has not posed any questions in its consultation. Moreover, the technical studies and data that are causing the Department to have concerns regarding potential interference to radio altimeters have not been shared. There is little information for the RABC to review with respect to the proposed modifications to SRSP-520.
6. It is imperative that systems be able to co-exist without harmful interference, particularly during the phasing in of new standards for radio altimeters. Without access to the technical parameters and assumptions in the sharing studies, the RABC cannot confirm if the proposed measures are sufficient to protect radio altimeter operation or, conversely, whether they may be unnecessarily restrictive on 5G networks. Similarly, the RABC cannot offer advice as to whether alternative measures could be established to allow for fewer restrictions on the operation of active antenna systems using beamforming and positive antenna elevation angles by flexible use systems, while still providing protection to radio altimeter operations. The RABC recommends that the Department commit to a formal review (e.g., meaningful follow-on consultation) of these currently proposed interim amendments to SRSP-520, in a timely fashion due to pending 5G deployments in the 3500 MHz band. The RABC’s intent if feasible is for the Department to relax and/or narrow the scope of the interim restrictions in a timely manner to alleviate the burden on terrestrial operators while at the same time gaining more certainty about the

¹ The RABC is not aware of any studies looking at potential harmful interference from 3450 – 3650 on radio altimeters.

specifications and efficacy of measures deemed critical to reduce potential harmful interference into radio altimeters.

7. We understand that the Department may be under Non-Disclosure Agreements with certain organizations, and this may be preventing the Department from providing the necessary data and studies supporting the proposed amendments to the SRSP. Due to the lack of supporting data, the RABC is unable to analyze the proposed amendments and provide relevant recommendations at this stage.
8. Furthermore, since the Department denied the RABC's request for an extension to the deadline for submitting responses to the consultation, RABC members that hold 3500 MHz licences are unable in such a short period of time to undertake their own studies to analyze the proposed amendments and provide recommendations.
9. Despite the limited information to review and the short time period to provide comment, the RABC offers the following preliminary observations (in paragraphs 10-13).
10. For the safety of aircraft landing, the French interim requirements² define safety zones and precaution zones, with constrained pfd deployments allowed in safety zones and limitations in the precaution zones. However, it is noted that the interim French requirements in power and tilt only apply to protection zones, while ISED, pending further study, has specified the tilt requirements everywhere (for the safety of aircraft landing in areas other than designated airports), not just in the protection zones.
11. Some other countries such as Japan and the US do not use exclusion or protection zones or uptilt restrictions. Japan opted to test several altimeters, and came up with a different set of rules requiring a 100 MHz frequency separation at the 4200 MHz band edge. In the US, there is an ongoing debate between the aviation industry³ and the mobile industry^{4,5} as evidenced by the record⁶.
12. The FCC has to date ruled that no additional protection of altimeters is required from any C-band transmissions (3700-3980 MHz), which are separated by at least 220 MHz from altimeter receivers. ISED's proposed restrictions for the 3500 MHz band limit 5G transmissions that are at least 550 MHz away from altimeter receivers.

² Note-technique-zones-secureite-precaution.pdf (anfr.fr) (ANFR-The band 3490-3800 MHz) (ECC PT1(21)006): <https://www.anfr.fr/gestion-des-frequences-sites/bande-3490-3800-mhz/#c10973>

³ https://www.rtca.org/wp-content/uploads/2020/10/SC-239-5G-Interference-Assessment-Report_274-20-PMC-2073_accepted_changes.pdf

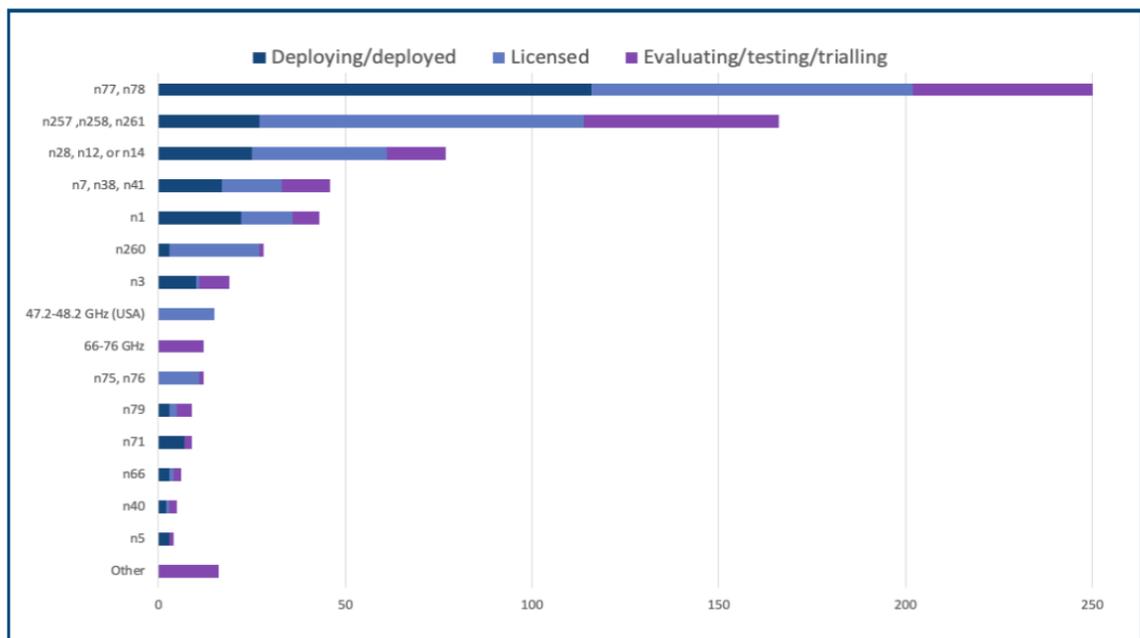
⁴ 210304 CTIA Further Response to RTCA Report.pdf: <https://ecfsapi.fcc.gov/file/12082367123850/201207%20CTIA%20Ex%20Parte%20on%20Auction%20107.pdf>

⁵ 5G Americas whitepaper, Midband Spectrum and the Coexistence with Radio Altimeters, July 2021: <https://www.5gamericas.org/wp-content/uploads/2021/07/Mid-Band-Spectrum-and-the-Co-Existence-with-Radio-Altimeters.pdf>

⁶ fcc.gov, GN Docket No. 18-122

13. 5G n77/n78 networks have been deployed globally since 2018. More than forty countries have for several years operated such networks. These markets have multiple operators deploying these networks with over 100 operators deployed or deploying⁷ n77/n78 networks per Figure 6 below, more than any other 5G band. Similarly, there are more n78 devices⁸ announced than any other 5G band per Figure 7 below. ISED has not disclosed whether or not they are aware of incidents of harmful interference to radio altimeters from n77/n78 networks in these countries nor whether any of these countries (other than France) have implemented specific measures to reduce the risk of harmful interference to radio altimeters from n77/n78 networks.

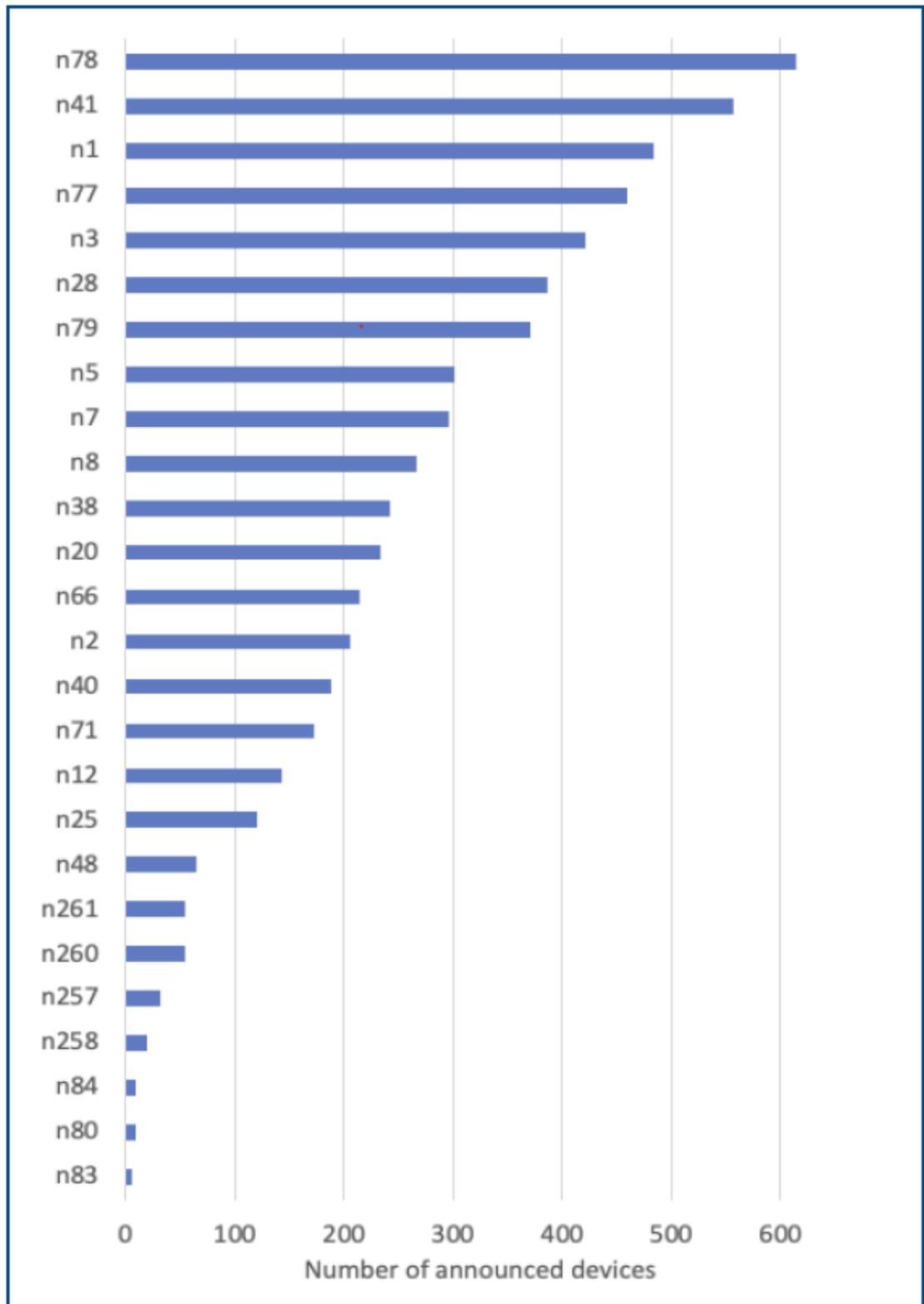
Figure 6: Counts of operator investing in key 5G spectrum bands (mid-August 2021)



⁷ GSA 5G Market Snapshot August 2021.

⁸ GSA 5G Market Snapshot August 2021.

Figure 7: Counts of announced 5G device models supporting key 5G spectrum bands (end July 2021)



14. The outdoor antenna tilt restrictions⁹ which are proposed to be applied in all areas across Canada will to a certain extent compromise the performance of 5G deployments in the 3500 MHz band in terms of coverage and capacity and will add material operational complexity, although the magnitude of these impacts will only be determined through further study. Operators will also face a real challenge to adapt to these constraints in the very short time now before deployment begins. It is assumed that Canada specific equipment firmware will need to be developed and maintained. The outdoor antenna tilt restrictions will add cost to the provision of service in the band and incremental costs will persist as long as the requirements remain in place.
15. The proposed amendments could have a significant impact on the already planned flexible use deployment by mobile operators in the 3500 MHz band. The proposed amendments are at the very least expected to adversely impact the following deployment scenarios and 5G use cases in the 3500 MHz band:
 - Planned deployments near airports due to adherence to the exclusion zones and proposed power limits
 - Multi-Dwelling Unit (MDU) deployments planned to be served from lower elevations via AAS base stations using FD-MIMO technology enabling elevation beamforming
 - Integrated access and backhaul technology, enabling dense and rapid deployment of small cells relying on backhaul links to adjacent rooftops.
16. The RABC recommends that the requirement set out in Section 10.3, Paragraph 57(a) of the proposed SRSP-520, should be a “drone” requirement¹⁰ since “base stations” do not know if the UE is a drone. Regardless, this topic requires further study and ideally that would lead to UE/drone requirements which would alleviate the need for the proposed base station requirements in SRSP-520 related to drones.
17. Section 10.3, Paragraph 57(b) of the proposed SRSP-520, states that operators of outdoor non-AAS and AAS fixed point-to-point and point-to-multipoint stations may decide to operate with a positive angle with reference to the horizon given that they shall not exceed a maximum e.i.r.p. of 62 dBm per radio frequency (RF) channel. It is not clear whether this maximum is 62 dBm per MHz (62 dBm/MHz) or 62 dBm per 20 MHz (62 dBm/20MHz), or some other channel bandwidth. (We note that RSS-192 defines a similar maximum as per 5 MHz). This is potentially a significant reduction in power as the power limit specified in SRSP-520 Issue 1, of 68 dBm per 5 MHz.
18. Without access to the technical parameters and assumptions in the sharing studies, the RABC cannot confirm whether a maximum e.i.r.p. of 62 dBm per RF channel would be sufficient to protect radio altimeter operation. However, the RABC seeks to establish a suitable power limit that would allow for the operation of active antenna systems using beamforming and positive antenna elevation angles by flexible use systems in urban areas

⁹ The RABC is not aware of any jurisdiction other than Canada that has to date restricted uptilt outside of exclusion and protection zones (i.e., on a blanket basis).

¹⁰ 3GPP Release 15 introduces UA (unmanned aircraft) support.

while still protecting radio altimeter operations.

19. Section 10.3, Paragraph 57(c) of the proposed SRSP-520, states that operators of outdoor non-AAS and AAS base stations are required to operate their antenna systems at a “negative elevation angle with reference to the horizon”. Should the Department decide not to relax the proposal in 57(b) to allow the operation of outdoor active antenna systems using beamforming and positive antenna elevation angles at reduced power (as recommended in paragraph 17 above), the RABC recommends that the 57(c) text should be changed as follows: “negative elevation angle with reference to the horizon” should be expanded to “negative elevation angle with reference to the horizon which is defined as the net combination of both electrical and mechanical downtilts as appropriate”.
20. The RABC would also ask that ISED review and confirm that the exclusion and protection zones be clarified as accurate. It was observed from the interactive map of exclusion and protection zones surrounding select Canadian airports that the axis of the exclusion and protection zones surrounding runways 13/31 at Gander do not appear to be lined up with the axis of runways 13/31.
21. The RABC intends to initiate a working group to focus on this coexistence issue between 5G 3.5/3.8 GHz and Aeronautical Radio Altimeters. RABC members would like to actively participate in any future studies and have full access to any of the reports/studies in progress as soon as they are available in order to be able to carry out independent analysis on the temporary amendments proposed by ISED. As part of this process, it would be helpful for the Department to provide details regarding the type of supporting data, as well as a summary description of the studies used by the Department in developing the interim measures in SRSP-520. The timing of further study is urgent. There are significant linkages between the technical rules in SRSP-520 (for the 3500 MHz flexible use band) and the yet to be developed technical rules for the 3800 MHz flexible use band. The RABC and industry need to fully understand any potential interference between 5G systems, operating in either the 3500 MHz or the 3800 MHz band, and radio altimeters as well as other services such as FSS.
22. The RABC believes it is important to have a transparent and predictable process so that standards can be written accordingly to protect the seamless operation of all services. The RABC looks forward to participation in all future studies and consultations on this issue as well as the upcoming consultation processes associated with the transition of the 3800 MHz band.

Sincerely,



J. David Farnes
General Manager