

Notice No. SLPB-005-18
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***Addendum to the Consultation on Releasing Millimetre Wave
Spectrum to Support 5G, Notice No. SLPB-005-18***

**Comments
of
SHAW COMMUNICATIONS INC.**



July 5, 2018

I. INTRODUCTION

1. The following constitutes the initial comments of Shaw Communications Inc. (“Shaw”), on behalf of itself and of Freedom Mobile Inc. (“Freedom”), to Innovation, Science and Economic Development Canada (the “Department” or “ISED”) in connection with the proceeding (the “Consultation”) initiated by the *Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G*, Notice No. SLPB-005-18, which contemplates the release of millimetre wave (“mmWave”) spectrum in the 26.5-27.5 GHz (“26 GHz”) band, in addition to the bands identified in the *Consultation on Releasing Millimetre Wave Spectrum to Support 5G* (the “Initial mmWave Consultation”).¹
2. In submissions to the Initial mmWave Consultation, Shaw and others recommended that ISED consider additional mmWave bands for release given the importance of mmWave spectrum as a foundation for 5th generation (“5G”) mobile communication technology and applications. We therefore commend the Department for launching the present Consultation to consider the release of additional mmWave spectrum for 5G. In short, this Consultation represents another step towards ensuring the success of 5G in Canada.
3. Shaw supports the release of additional spectrum, including the 26 GHz band, on a pro-competitive basis to support 5G. Recognizing the transformational effect that 5G holds for the future of connectivity, regulators around the world are looking for opportunities to allocate more spectrum that can be used to support 5G networks. With this and other consultations,² the Department is helping to ensure that Canada will be a leader in 5G.
4. In light of the foundational importance of mmWave spectrum to 5G, it is imperative that the Department implement pro-competitive spectrum policies applicable to all mmWave bands, including the 26 GHz band. These consultations come at a pivotal moment for the Canadian wireless market. Facilities-based competitors such as Freedom Mobile have entered various markets across the country, challenging the decades-long market dominance of the incumbent wireless providers and representing the potential for true, sustainable competition in this market. At the same time, we are approaching the full-scale transformation of the wireless marketplace to 5G, which will elevate the importance

¹ SLPB-001-17, June 2017.

² E.g., Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band, SLPB-004-18, June 2018; Consultation on the Spectrum Outlook 2018 to 2022, SLPB-006-17, October 2017.

of the connectivity market in the day-to-day lives of Canadians. Consequently, the foreclosure incentives of the incumbent wireless providers are at an all-time high as the Big 3 seek to maintain their market power in the delivery of 5G services.

5. The full potential of 5G will only be realized if the Big 3 incumbents face strong competitors that are able to make the significant investments that are required to enable dynamic alternatives to the Big 3 for next generation wireless services. In May, in collaboration with Nokia, CableLabs and Rohde & Schwarz, Shaw completed its first 5G technical trials leveraging mmWave and 3500 MHz spectrum, demonstrating its commitment to be a leader in the Canadian 5G market.³
6. Therefore, it is crucial that the Department continue to promote facilities-based competition in its spectrum policymaking. With competition finally starting to take hold in the wireless marketplace, we have reached a critical juncture at which the actions (or inaction) of policymakers and regulators have the ability to ensure sustainable competition in the delivery of 5G services or extend the status quo to the 5G world. In Shaw's view, we must not undo the significant progress that has been made by the federal government and new competitors in recent years to bring true competition, and its attendant benefits of choice and affordability, to the wireless sector.
7. With regard to the mmWave bands, pro-competitive policymaking starts with this Consultation and the Initial mmWave Consultation. These consultations lay the groundwork on a number of issues, such as band plans and spectrum allocation and utilization policies, setting the stage for subsequent consultations that will consider specific pro-competitive auction and licensing measures. The policies that emerge from the present Consultation should both pursue the promotion of competition and preserve the flexibility to adopt suitable pro-competitive measures in future licensing proceedings.
8. The Department can accomplish this by taking the following actions:
 - Develop a flexible use licensing model in the 26 GHz band (in addition to those mmWave bands identified in the Initial mmWave Consultation);

³ See "Shaw Communications completes its first successful 5G technical trials," Press Release, May 22, 2018, available online at <http://newsroom.shaw.ca/materialDetail.aspx?MaterialID=6442452113> (accessed 28 June 2018).

- Adopt a band plan for the 26 GHz and 27.5-28.35 GHz (“28 GHz”) bands that is aligned with 3GPP band class n257; and
 - Incorporate pro-competitive policy measures into its licensing considerations in the 26 GHz and 28 GHz bands.
9. Shaw respectfully submits that these initial steps can help ensure a more competitive landscape for Canada’s 5G wireless market.

RESPONSES TO CONSULTATION QUESTIONS

QA1 - ISED is seeking comments on the development of a flexible use licensing model for fixed and mobile services in the 26 GHz band (in addition to the bands currently under consultation through the mmWave Consultation), taking into account the timing of WRC-19, 5G technology standards development, international ecosystems and harmonization of spectrum use with other countries.

10. Shaw supports the development of a flexible use licensing model in the 26 GHz band, in addition to those mmWave bands identified in the Initial mmWave Consultation.
11. While the 26 GHz band is on the agenda for the 2019 World Radiocommunication Conference (“WRC-19”), as with the other mmWave bands, Canada should not wait for WRC-19 to finalize its 5G standards before developing a flexible use licensing model for this band. Indeed, other countries already are moving aggressively to free up spectrum in the 26 GHz band under flexible use licensing. For example, the United States recently proposed flexible use policies for the 26 GHz band as it looks for opportunities to make more mmWave spectrum available for 5G,⁴ and several European and Asian regulators are also working on accelerated release of the 26 GHz band or portions thereof.

⁴ See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order, Further Notice of Proposed Rulemaking, Memorandum Opinion and Order, FCC 18-73, (rel. Jun 8, 2018). Moreover, as part of its *Spectrum Frontiers* proceeding, the FCC has adopted flexible use licensing for the 24 GHz, 28 GHz, 37 GHz and 39 GHz bands.

European Countries Focusing on the Release of 3.6 GHz & 26 GHz Bands



Source: Qualcomm, [Timely access to 3.6 GHz and 26 GHz spectrum is key to 5G's success in Europe](https://www.qualcomm.com/news/onq/2018/03/19/timely-access-36-ghz-and-26-ghz-spectrum-key-5gs-success-europe)⁵

12. ISED's proposal to make the 26 GHz band available for flexible use will help ensure that Canadians receive the fullest possible benefit of 5G. 5G represents a new era in connectivity. Yet, the innovative potential of 5G is vast, and at this time we likely have contemplated only a fraction of the possibilities it holds. Extending a flexible use model to 26 GHz will allow 5G innovators to experiment and network operators to better plan to 5G deployments.

13. The release of mmWave spectrum should not precede the release of 600 MHz or 3500 MHz spectrum. However, the Department should proceed in a timely manner, given international developments in the band. Indeed, the current Chairman of the Federal Communications Commission in the United States has announced his intention to hold two auctions for mmWave spectrum in the relatively near term.⁶ By scheduling releases of mmWave spectrum following the release of 600 MHz and 3500 MHz spectrum in Canada, ISED will enable network operators to plan for and deploy network infrastructure

⁵ OnQ blog, March 19, 2018, available online at <https://www.qualcomm.com/news/onq/2018/03/19/timely-access-36-ghz-and-26-ghz-spectrum-key-5gs-success-europe> (accessed 5 July 2018).

⁶ Ajit Pai, "Winning the Wireless Future," FCC Blog, March 1, 2018, available online at <https://www.fcc.gov/news-events/blog/2018/03/01/winning-wireless-future> (accessed 28 June 2018).

in a manner that supports the expeditious and efficient deployment of 5G networks and services to Canadians using the mmWave bands.

QA2 — ISED is seeking comments on the changes proposed above to introduce flexible use licensing in the 26 GHz band, including the ensuing changes to the CTFA Canadian footnotes and the policy on this band contained in SP 3-30 GHz, Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation.

14. Shaw supports the proposed changes to introduce flexible use licensing in the 26 GHz band, including the ensuing changes to the CTFA.

QA3 — ISED is seeking comments on the importance of harmonizing the Canadian band plan with the United States in the 26 GHz and 28 GHz bands, recognizing that the 26 GHz band is not available for 5G services in the United States at this time.

15. As ISED notes, the proposed 26 GHz (26.5-27.5 GHz) and 28 GHz (27.5-28.35 GHz) flexible use bands fall entirely within the 3GPP n257 band from 26.5 to 29.5 GHz, and there are several advantages to harmonizing the Canadian band plan for the 26 GHz and 28 GHz with the 3GPP band class n257.
16. First, as the Department has noted, there is international interest in releasing various portions of the 26 and 28 GHz bands, and the 26 GHz band has the potential to be a global roaming band. Given these trends, we are confident that a robust device ecosystem based on the 3GPP standard will emerge. Harmonization with this international standard in Canada will enable access to larger equipment ecosystems and economies of scale, lowering costs for consumers and helping to promote competition in the Canadian market. Indeed, because the Canadian wireless market typically is not large enough to attract manufacturers to build equipment uniquely for the Canadian market, Canada's band plans are often harmonized with international markets to allow Canadian providers to take advantage of lower costs and greater selections of wireless handsets and equipment. Harmonization will also support both incoming and outgoing international roaming.

17. Second, this approach would enable a single, contiguous band of 1,850 MHz comprising the two sub-bands, which would lead to greater overall efficiency and flexibility during licensing and deployment. For example, as discussed below, the Department would have the flexibility to licence the spectrum in several larger spectrum blocks, potentially enabling new use cases that require ultra-fast fixed and mobile broadband applications, while also balancing the need for new competitors to access the spectrum.
18. We note that since the launch of this Consultation, the FCC proposed making spectrum in the 26 GHz band (which it defines as 25.25-27.5 GHz) available for flexible fixed and mobile use and is currently consulting on the band plan for this spectrum, among other things. We expect the FCC to proceed expeditiously with this consultation and subsequent licensing of this spectrum to create alignment with deployment of 5G in the 24 GHz and 28 GHz bands.⁷

QA4 — ISED is seeking comments on the minimum block size that should be made available for the 26.5–28.35 GHz band. Is it necessary that the frequency blocks be multiples of the 3GPP channel bandwidths (50 MHz, 100 MHz, 200 MHz and 400 MHz)?

19. Generally speaking, frequency blocks that are multiples of the 3GPP channel bandwidths would ensure the most efficient use of the spectrum given the likelihood that the majority of 5G equipment will comply with 3GPP standards. Adopting a band plan that is not based on multiples of the 3GPP channel bandwidths will likely lead to spectrum underutilization.
20. With respect to block size, it is important that the Department set a band plan that facilitates equitable access to the band by strong competitors while also being capable of supporting the capacity needs of 5G through large bandwidth channels. However, as ISED has noted,⁸ a decision on the specific block sizes that will be licensed will be made in a subsequent proceeding. At this stage, ISED should adopt a band plan that provides

⁷ As noted in Shaw's reply comments to the Initial mmWave Consultation, whatever band plan the Department ultimately adopts must accommodate an alternative facilities-based provider to the incumbents in these bands (see Reply Comments of Shaw Communications Inc. to the Initial mmWave Consultation, November 10, 2017, at paragraphs 43-44). Therefore, while it may be worthwhile to monitor the FCC's proceeding on 26 GHz, the Department should not adopt a band plan that would do anything to jeopardize sustainable competition in these bands.

⁸ See Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band, SLPB-004-18, June 2018, at paragraph 51.

it with the maximum flexibility to achieve the aforementioned objectives in a future proceeding.

QA5 — A. ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services in the 26.5–27.5 GHz band to ensure coexistence with ISS.

B. If limits are proposed, ISED is inviting detailed proposals on what the limits should be, and why they should be implemented.

21. In light of the current research suggesting that harmful interference to space stations due to aggregate emissions from 5G systems is unlikely, Shaw support's ISED's proposal to refrain from placing limits on the aggregate emissions produced by flexible use systems in the 26 GHz band. Such restrictions would only be justified if there is conclusive evidence of interference.

QA6 — A. ISED is seeking comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and EESS/SRS earth stations in the 26.5–27.0 GHz band when a pre-determined trigger threshold is exceeded.

B. If the proposed site-by-site coordination is supported, what coordination trigger and value would be the most appropriate (e.g. power flux density or distance threshold)?

C. ISED is also inviting proposals for specific additional technical rules for flexible use terrestrial stations and EESS /SRS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.

22. Shaw has no comment on this question at this time but may wish to provide comments as part of the reply phase of this proceeding.

QA7 — A. ISED is seeking comments on whether there should be restrictions on the geographic areas in which new EESS and SRS earth stations can be deployed in the 26.5–27.0 GHz band.

B. If geographic restrictions on EESS and SRS earth stations are proposed, ISED is inviting detailed proposals on how they could be implemented, and what areas should be targeted.

23. Shaw has no comment on this question at this time but may wish to provide comments as part of the reply phase of this proceeding.

-QA8 — A. ISED is seeking comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the 27.0–28.35 GHz band when a pre-determined trigger threshold is exceeded.

B. If the proposed site-by-site coordination is supported, what coordination trigger and value would be the most appropriate (e.g. power flux density or distance threshold)?

C. ISED is also inviting proposals for specific technical rules for proposed flexible use terrestrial stations and FSS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.

24. Shaw refers the Department to its reply comments in the Initial mmWave Consultation.⁹ We encourage the Department to require site-by-site coordination, but we note that such a requirement must be crafted properly to avoid any negative impact on investment. The Department should adopt new Canadian Footnote C47C, which does not allow for ubiquitous deployment of FSS earth stations, as well as a coordination trigger that avoids unnecessarily imposing the burdens of coordination on terrestrial licensees where there is no meaningful risk of harmful interference.

⁹ Reply Comments of Shaw Communications Inc. to the Initial mmWave Consultation, November 10, 2017, at paragraph 52.

QA9 — A. ISED is seeking comments on whether there should be restrictions on the geographic areas in which new FSS earth stations can be deployed in the 27.0–28.35 GHz band.

B. If geographic restrictions on FSS earth stations are proposed, ISED is inviting detailed proposals on how they could be implemented, and what areas should be targeted.

25. Shaw refers the Department to its reply comments in the Initial mmWave Consultation.¹⁰ ISED should adopt such restrictions, and in doing so, should consider how flexible use terrestrial services will be deployed in Canada when deciding the geographic parameters for FSS earth stations. For example, ISED should require that FSS earth stations be deployed a certain distance from urban areas to prevent interference.

QA10 — A. ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services in the 27.0–28.35 GHz band to ensure coexistence with FSS space stations.

B. If limits are proposed, ISED is inviting detailed proposals on why they should be implemented, and what the limits should be.

26. Shaw refers the Department to its reply comments in the Initial mmWave Consultation.¹¹ Imposing such limits is unnecessary, as aggregate interference from flexible use services with space stations is unlikely. The terrestrial systems envisioned for the band have technical characteristics that will limit transmissions toward satellite receivers.

QA11 — A. Further to section 9 of the mmWave Consultation, are there any new considerations or suggested approaches regarding the licensing of flexible use mmWave spectrum, given the addition of the 26 GHz band?

¹⁰ *Ibid.* at paragraph 54.

¹¹ *Ibid.* at paragraph 55.

B. ISED is also seeking comments on licensing considerations in the 26 GHz and 28 GHz bands that would encourage innovative use cases while also supporting competition for existing mobile network services.

27. As noted above, Canada would likely benefit most by aligning with the 3GPP n257 band plan. Combining the bands will allow larger blocks of spectrum to be licensed, enabling new use cases that require ultra-fast fixed and mobile broadband applications.
28. However, as Shaw stated in its comments to the Initial mmWave Consultation, the release of additional mmWave does not obviate the need for pro-competitive policy measures, particularly at this pivotal moment in the evolution of the Canadian wireless market. It is important that the decisions taken in this Consultation lay the groundwork for a licensing framework that promotes competition by, for example, establishing a band plan that will accommodate strong new competitors like Shaw.
29. With respect to ISED's proposal to reserve a small portion of this spectrum for shared use, such as on an all-come, all-served basis, Shaw submits that the Department's first priority should be the promotion of competition in the 5G market. The Department must therefore ensure the availability of sufficient licensed spectrum to support competitive offerings.