Submission to Innovation, Science and Economic Development Canada
by

SSI MICRO LTD.

In Response to SLPB-004-18

"Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band"

July 12, 2018

Introduction and Context

1. SSi Micro Ltd. ("SSi") is pleased to submit these comments to Canada's Minister of Innovation, Science and Economic Development ("ISED" or the "Department") in response to *Canada Gazette* notice SLPB-004-18, "***Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band***" (the "Consultation").

2. For the most part, our comments are presented as direct responses to the questions the Department poses in the Consultation.

Background on SSi

3. Founded in 1990, SSi is headquartered in Yellowknife, Northwest Territories, with a Satellite Teleport and Network Operations Centre in Ottawa, Ontario. SSi specializes in the design, deployment and operation of innovative and cost-effective communications networks to support the needs of communities with little to no terrestrial access to the outside world.

4. We understand first-hand the challenges faced in providing effective and affordable service to remote and outlying areas, and in providing a competitive alternative to the incumbent operator in small and remote markets.

5. SSi has deployed advanced satellite networks and local wireless facilities that deliver communications services throughout Nunavut under the "QINIQ" brand, and in communities of the Northwest Territories, an area spanning over three million square kilometres. SSi makes extensive use of both satellite and fibre transport to provide Canadian consumers, businesses and governments with backbone connectivity services. Most notably, satellite transport in our serving area makes extensive use of and is heavily reliant on the "C-Band", that is, the 3800 MHz Band which is the subject of this current Consultation.

6. Since 2009, SSi has been licensed in a single paired uplink/downlink block in the 3500 MHz band as currently configured, to offer fixed wireless service in Nunavut. We are currently licensed to use a total of 50 MHz in this band.

7. We are also a licensee of 1900 MHz spectrum in Nunavut, Yukon and the Northwest Territories, as well as being licensed to use 2500 MHz spectrum in Nunavut and the Northwest Territories.

8. We have made good use of licensed spectrum wherever feasible to offer valuable fixed and mobile data and voice services to the people of northern Canada. For instance, in 2004, in Yellowknife, SSi was the first in Canada to launch state-of-the-art WiMax broadband technology using 2500 MHz spectrum, and in 2005 we became the first (and still only) company to launch broadband service in all 25 Nunavut communities, again using WiMax

technology at 2500 MHz, and offering the same service level and pricing to Nunavummiut across the Territory. Since then, the positive impacts of broadband for consumers, organizations and small business have been clearly evident across the North.

9. SSi is now completing a 3-year, $75 million investment program into Nunavut communications infrastructure (which investments include $35 million through ISED's Connecting Canadians Program). This has led to infrastructure upgrades in all 25 communities to bring 4G-LTE (operating at 1900 and 2500 MHz) and 2G-GSM (operating at 1900 MHz) last-mile technologies for fixed and mobile data and voice services.

10. Remote area connectivity has many facets, and we are constantly evaluating, developing and integrating new technologies to ensure our offerings remain attractive and competitive. Despite the promise that this spectrum held when we first acquired it in 2009, we unfortunately have not yet been able to secure equipment that enables us to deploy fixed wireless service using our licensed 3500 MHz spectrum due to more economic or efficient alternatives in other bands.

11. Our experience of offering cutting-edge services in Canada's North leads us to be very encouraged by the proposals outlined in the Consultation to permit flexible use of licensed spectrum in the 3500 MHz band.

12. Flexible use of this band has strong potential to permit Canadian wireless carriers to develop, experiment with, and deploy 5th generation ("5G") technologies while taking into account the geographical and market realities of a country whose population is extremely unevenly distributed. In particular, flexible use can permit Canadians in remote and rural areas, including in the North, to continue to benefit from current services delivered over fixed wireless systems, even as those who live and work in more densely populated markets can begin to enjoy 5G technologies.

13. Flexible use, conceived and deployed correctly, can also facilitate the efforts of service providers like SSi to bridge the digital divide by enabling them to deploy the latest generation technologies as soon as demand conditions warrant in the Northern, remote and rural areas they serve.

14. We believe that the Department should implement the proposals it has outlined in the Consultation, but should adjust them to take into account the observations and comments made below.

Specific Comments on the Consultation

Q1. ISED is seeking comments on its assessment of the timelines identified for the development of an equipment ecosystem for 5G technologies in the 3500 MHz and 3800 MHz bands, and whether the timelines will be the same in both bands.

SSi Comments

15. SSi has no specific comment to offer at this time on the assessment that ISED provides concerning the timelines for the development of the 5G equipment ecosystem, nor whether the timelines are likely to be the same in both bands.

16. However, we would emphasize that in addition to the question of whether 5G equipment is *available* at certain times, it is also relevant to consider whether the deployment of 5G equipment will be *feasible in Canada's North,* both economically and in terms of meeting implementation challenges posed by distance and climate, in similar timeframes.

17. To permit competition to continue to develop in Northern markets, including remote and rural markets, we emphasize that spectrum licensees will benefit from flexibility that permits them to make reasonable determinations concerning when and how they might offer services based on 5G technologies. These determinations will be significantly affected by issues of economic and material feasibility, as well as market demand.

18. Flexibility will permit licensees serving sparsely populated or economically challenging parts of Canada to pursue the acquisition and deployment of the technologies that will best meet market conditions, thereby ensuring that they make the most efficient use of licensed spectrum.

Q2. ISED is seeking comments on the proposals for:

- ***Adding a primary mobile allocation in the 3450-3475 MHz band***
- ***Removing the radiolocation allocation in the 3450-3500 MHz band***
- ***Making the corresponding changes to the Canadian Table of Frequency Allocations***

SSi Comments

19. SSi supports these proposals. All are intended to expand the availability of flexible use spectrum, which we support. The Department notes that removing the priority for radiolocation use in the 3450-3475 MHz band will not "negatively impact the operation of government radiolocation systems or the existing fixed point-to-point use" in this band (Consultation, para. 32). Nor will the same change to the 3475-3500 MHz band affect radiolocation, as there are no current radiolocation users in that part of the band (para. 33).

Q3. ISED is seeking comments on the proposal to allow flexible use in the 3450-3475 MHz band.

SSi Comments

20. SSi supports this proposal. In particular, we note the Department's observation that "flexible use licensing would enable licensees to better target their services to the needs of their customers" (para. 36). This could be helpful to SSi as a licensee in Nunavut, where, as noted, we offer a range of services including mobile in the 1900 MHz and 2500 MHz bands. The ability to use licensed spectrum to meet the needs of the market for fixed or mobile service is generally a positive development.

Q4. ISED is seeking comments regarding interest in sharing spectrum between radiolocation and other services in the 3400-3450 MHz band, and options for doing so.

SSi Comments

21. SSi takes no position on this proposal at this time.

Q5. ISED is seeking comments on the expected impacts of the following options with regards to the continuation of existing services, competition in the Canadian marketplace, and availability of new 5G services for Canadians.

Option 1 – For each licence area, existing licensees would be issued flexible use licences for one third of their current spectrum holdings rounded to the nearest 10 MHz, with a minimum of 20 MHz.

Option 2 – For each licence area, existing licensees would be issued flexible use licences for a fixed amount of spectrum. Any licensee that holds 50 MHz of spectrum or more would be licensed for 50 MHz, and all other licensees would be licensed for 20 MHz.

SSi Comments

22. Of the two options suggested, SSi favours Option 2. This option will permit current licensees as well as the Department to assess how much spectrum is required to continue existing services offered in the licensed 3500 MHz spectrum band so as to free up what is not required for new 5G services, when they become available. Moreover, this option would have the least impact on existing competition in the Canadian marketplace, as it would permit existing licensees to have new flexible use spectrum licences on the understanding that upon issue of the new flexible use licences, their existing fixed use spectrum licences will be cancelled (para.

44). Option 2 provides for greater certainty for existing licensees, while reserving adequate bandwidth for new uses including 5G.

Q6. ISED is seeking comments on alternative options for licensees to return spectrum to the Department to make available for a future licensing process. Respondents are asked to provide a rationale for any alternative proposals, including how they would meet ISED's policy objectives as stated in section 3.

SSi Comments

23. SSi has no alternative options to put forward at this time. However, we reserve the right to comment on any alternative proposals advanced by other parties to the Consultation.

Q7. ISED is seeking comments on a revised band plan using unpaired blocks of 10 MHz in the frequency range of 3450-3650 MHz.

SSi Comments

24. SSi generally supports the revision proposed to the band plan for the 3450-3650 MHz frequency range. We understand that the Department established the current band plan in anticipation that equipment supporting frequency division duplexing ("FDD") would predominate. As things have turned out, most of the equipment being used in this band uses time-division duplex ("TDD") technology.

25. Assuming that the proposed revised band plan will accommodate the use of TDD technology at least as well as the current band plan, we support this change.

Q8. ISED is seeking comments on whether any additional measures should be taken to limit potential interference issues with the proposed TDD band plan.

SSi Comments

26. SSi takes no position at this time as to whether any additional measures are required to limit potential interference issues in the event the Department goes ahead with its proposed revised band plan, based on TDD technology.

Q9. ISED is seeking comments on the proposal to align the timing of the issuance of flexible use licences to incumbents with the issuance of licences to those who acquire 3500 MHz flexible use licences in a future licensing process.

SSi Comments

27. ISED makes this proposal with a view to preventing existing licensees from taking advantage of new, flexible licences to deploy mobile services, based on LTE (4G) systems they have already or are already deploying in the 3500 MHz band, in advance of the new entrants ISED envisions licensing to use part of the same band for 5G services when equipment becomes available for 5G. The proposal additionally assumes that 5G equipment will become available in the 2019-2020 time frame.

28. As an incumbent licensee of 3500 MHz spectrum, SSi supports the Department's initiative of ensuring that incumbents are not unfairly advantaged in the competitive market that ISED clearly anticipates will develop for 5G services in Canada. We appreciate the Department's effort to craft an even-handed approach between incumbents and potential new entrants in this spectrum block.

29. However, the proposal to align the timing of issuance of flexible use licences to incumbents with the issuance of new flexible use licences does not entirely resolve the matter of head start advantages.

30. For one thing, if existing licensees are prevented from applying for new flexible licences until some undefined time frame which can only be fixed once we develop a better sense of when equipment for 5G will become practically available in Canada, existing licensees whose licences expire before new licences can be made available could be forced to relinquish their existing licences – forfeiting the licence fees and amounts paid for such licences through auction – before they have any idea whether they can realistically retain, obtain or bid for desirable licences in the new flexible use spectrum that is made available for 5G. This situation would apply, for instance, to licensees whose current licences expire in autumn 2019, as is the case for many licensed in the 2009 auction proceeding, in the not unlikely event that equipment does not become available and a licensing process cannot be organized before then.

31. This circumstance undermines the Department's stated desire to permit existing licensees to apply for new, flexible use licences on the understanding that they will relinquish their existing fixed licences when new licenses are issued (Consultation para. 44, referenced above). And it could easily apply to many existing licensees, including SSi, thereby foreclosing their ability to benefit from flexible use licences unless they apply with new entrants.

32. Realistically, the only incumbents that will be able to participate in the proposed timed process are those whose existing licences extend comfortably into 2020.

33. Intergenerational inequities could affect potential new entrants, as well. With the coinciding timing proposal, only incumbent licensees whose licences extend into the foreseeable

timeframe for new 5G entry have the assurance that they will be have the spectrum they need to compete in offering these new services. Potential new licensees will have no such assurance. As such, this proposal has the potential to unfairly advantage larger incumbent licensees if not properly implemented.

Q10. ISED is seeking preliminary comments on the importance of price discovery in a licensing process for flexible use licences in the 3500 MHz band.

SSi Comments

34. SSi has no position to put forward at this time concerning the importance of price discovery in this licensing process. However, we reserve the right to comment on any views advanced by other parties to the Consultation.

Q11. ISED is seeking comments on the proposed protection and notification provisions for incumbent licensees as outlined below.
Protection period:

- ***For Tier 4 service areas that include a population centre of 30,000 people or more:***
  - ***A minimum protection period of 6 months for sites within large urban population centres and the 10 km buffer zone surrounding those centres***
  - ***A minimum protection period of 2 years for all other sites***
- ***For all Tier 4 service areas that include a population centre of less than 30,000 people, a minimum protection period of 3 years***

Notification period:

- ***A minimum notification period of 6 months in large urban population centres and in the 10 km buffer zone surrounding those centres***
- ***A minimum notification period of 1 year in all other areas***

SSi Comments

35. Generally, SSi considers the proposed protection and notification provisions for incumbent licensees, as outlined in the Consultation, to be reasonable.

Q12. ISED is seeking comments on alternative transition plans, or variations to the times proposed. Respondents are asked to provide a rationale for any alternative proposals.

SSi Comments

36. SSi has no alternative transition plans or variations to the times proposed to put forward at this time.

Q13. ISED is seeking comments on whether the fixed and mobile equipment for LTE and 5G technologies will be able to operate with intermittent interference from radars, including cross-border interference, within the 3450-3650 MHz band and in adjacent bands.

SSi Comments

37. SSi takes no position on this question at this time.

Q14. ISED is seeking preliminary comments on how to optimize the use of the 3650-3700 MHz band, including the potential use of a database access model.

SSi Comments

38. SSi takes no position on this question at this time.

Q15. ISED is seeking comments on the importance of the 3700-4200 MHz band to future FSS operations.

SSi Comments

39. For as long as C-band satellite systems continue to play a vital role in the networks of operators, like SSi, which offer telecommunications and internet access in remote and northern locations, we believe this band will be vital to future fixed satellite service ("FSS") operations.

40. At present and for the foreseeable future, we rely and will rely on C-band satellite transmissions for backbone connectivity to the communities we serve in the North – including all twenty-five communities of Nunavut. Using this band permits us to offer both voice and data services, and FSS in this frequency band is also an essential component of the mesh network we have built to serve large areas in the North. The distribution characteristics of the downlink portion of the C-band make it a suitable component of mesh telecommunications networks over large areas.

41. Should any portion of the 3800 MHz band be reallocated to a different use in the future, we will still need to have access to lower frequencies to ensure reliable operation of both voice and data services, especially given the often-challenging weather conditions in Canada's Arctic. Both surface conditions and the distances involved make FSS a crucial component of the network we have built and on which many customers in Nunavut rely to interact with the

wider world. Weather conditions in the North make C-band FSS far more reliable as the basis of telecommunications networks than are FSS in the higher frequency Ku-band and Ka-band.

42. Having interference-free use of the C-band is also vitally important near terrestrial facilities in southern Canada that enable communications via satellite with the north. SSi operates such a facility in Kanata, Ontario.

43. So, in sum, we believe that for the foreseeable future any sharing ISED could consider in this frequency band must make certain to protect existing FSS users.

Q16. ISED is seeking comments on whether unlicensed operators in the 3700-4200 MHz band should be required to submit their technical parameters to ISED to assist in frequency management.

SSi Comments

44. The importance of the C-band to telecommunications to and from Canada's North is such that, in our view, it should be reserved to the greatest extent possible for licensed users. Interference in this band near any of our facilities could cause loss of efficiency and capacity in our network. Determining the source of any such interference and resolving conflicts is significantly more difficult if it is caused by an unlicensed and unregistered user. Therefore, we support ISED's initiative of requiring unlicensed operators in the 3700-4200 MHz band to submit their technical parameters to ISED to assist in frequency management.

Q17. ISED is seeking comments on which steps Canada should take to optimize the use of the 3700-4200 MHz band in consideration of the current services being provided and the developing technologies that would permit the use of new services in this band (e.g. exclusion zones).

45. So long as operators like SSi use the 3700-4200 MHz band for FSS to provide essential telecommunications and internet access services in the North, that use must be protected. In protecting FSS, the Department should consider the strongest measures possible. Exclusion zones could be a useful measure in this respect.

46. We note, however, that in establishing exclusion zones in urban areas to enable the introduction of 5G services in this spectrum, ISED needs to be aware of FSS users, like SSi, which rely on C-band facilities in urban areas in the south to provide vital connectivity to and from the North. Our Kanata facility enables connection to the larger internet for many Nunavut residents, and needs to be protected in the event the Department decides to follow the lead of countries that rely far less on C-band FSS than Canada does by releasing any of this spectrum for 5G service.

Q18. ISED is seeking comments on the challenges and considerations related to the coexistence of other services, such as mobile and/or fixed wireless access, in the 3700-4200 MHz band.

SSi Comments

47. As noted above in response to questions 15 through 17, the coexistence of any service poses difficulties to FSS in the 3700-4200 MHz band. Given the importance of C-band FSS to our network, we view with concern the prospect of additional use of this band for mobile and/or fixed wireless access service. Should the Department feel it needs to enable different or even flexible use of any portion of this band, we hope it will first establish priorities for existing FSS users that clearly shift the burden and cost of dealing with any interference to the new entrant.

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