

November 30, 2020

Senior Director, Spectrum Licensing and Auction Operations Spectrum,
Information Technologies and Telecommunications Sector,
Innovation, Science and Economic Development Canada
235 Queen Street, 6th Floor
Ottawa, ON, K1A 0H5

Subject: Reply Comments by Redline Communications Group Inc. re Canada Gazette Notice No. SLPB-002-20-2020, August 2020

Dear Madam,

Redline Communications Group Inc. is pleased to submit its reply to stakeholder comments submitted on October 26, 2020 regarding the above noted Gazette Notice.

Sincerely,



Brad Stimpson
Vice President, Engineering

REPLY COMMENTS OF

REDLINE COMMUNICATIONS GROUP INC.

CANADA GAZETTE NOTICE NO. SLPB-002-20-2020

NOVEMBER 30, 2020

Introduction

1. Redline Communications Group Inc. (Redline) hereby submits its comments in reply to submissions from other stakeholders regarding **Canada Gazette Notice No. SLPB-002-20-2020: Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band** (“the Consultation”).
2. Redline is the worldwide leader in private wireless networks for industrial and mission-critical applications. We serve the electric utility, oil and gas, mining, government and enterprise sectors by providing private, secure, reliable and robust wireless networks at a fraction of the cost of the major vendors usually relied upon by the national carriers and MNOs.
3. There is huge demand in Canada for private LTE solutions that can be delivered economically, whether for smart grid/utility applications, mining installations, oil and gas development sites or remote towns without wireless or broadband service that incumbents are unable to serve economically due to the inflexible nature of their networks that makes customized solutions challenging. Redline has the technology and the wherewithal to build and deploy high quality, ruggedized private networks customized to the precise needs of our customer base.
4. In these reply comments, we will confine our comments to the main recommendations we made in our initial submission:
 - a. **ISED should align with the U.S. to the extent possible**, including implementation of a shared spectrum regime similar to CBRS. This is the most efficient manner in which to allocate spectrum that considers the majority of stakeholders, including the MNOs;
 - b. **Spectrum should be used or shared**. Spectrum concentration is a real concern, and in rural Canada where barely any the incumbent’s spectrum holdings are being used, this concentration of resources in the hands of a few runs directly counter to ISED’s goal of innovation, competition and timely deployment.
 - c. **WBS license holders should not be migrated from their current spectrum (3650-3700 MHz)**, ISED’s Option 2, as it has the potential to annihilate an entire industry class and impacting hundreds of thousands of rural users. Rather, Option 1 should be implemented whereby WBS users are permitted to transition to the new technology over time within the 3650-3700 MHz band. Further, this should be done in the context of an overall shared licensing regime.

Alignment with the U.S. - CBRS

5. Almost all respondents to the Consultation agreed that there should be alignment in some form with the U.S. Although obvious differences exist, the fact that the longest contiguous border in the world runs between the two countries means that in many ways the two countries represent one market. We cannot pretend that what occurs in the U.S. does not affect us here. There is solid agreement behind this principle.
6. There were many voices, including Ericsson, advocating alignment down to the device level. We agree. Canada should not be setting equipment standards that make it difficult for players here to find compliant hardware. This includes rules around the power level of devices that should be consistent across all users, and not favor the larger players over the smaller ones.
7. The main plank of our proposal for Canada-U.S. alignment is for Canada to establish a CBRS-like shared spectrum licensing regime throughout the 3800 MHz band, with GAA licenses in the 3650-3700 MHz range and an auction for PAL licenses in the rest of the range. Similar proposals were made by other stakeholders including Shaw, BCBA and CEA, among others.
8. Some respondents on the other hand, first and foremost the MNOs, are insistent that anything less than 100 MHz of contiguous spectrum would render 5G less beneficial due to a number of technical considerations. Fragmenting the spectrum (as a CBRS-regime would by definition result in) means that **Carrier Aggregation** technology (“CA”) would be required to pull together the full 100 MHz they believe is required for 5G. CA, they contend, would make their networks less efficient and result in Canadians losing out on the full benefits of 5G.
9. We disagree with this assertion. Carrier aggregation is a mature technology and a capability extensively used by the same MNOs today to great effect. Further, CA has been used in the U.S., where 5G networks are flourishing within a CBRS operating model. To our knowledge there has not been a perceptible diminishment of quality as a result.
10. Bell argues that high capacity, low latency and reliability are achievable only through high channel bandwidths/contiguous spectrum (paragraph 5). We do not agree with this assertion. Any solution that provides a greater total bandwidth available – either with a single wide channel or the aggregation of multiple smaller channels – would have the mentioned characteristics on capacity, data rate, latency and reliability. As with increased channel BW, non-contiguous carrier aggregation increases the data rate and hence lowers the latency of the system. In fact, increased data rate and reduced latency were among the main reasons for the introduction of carrier aggregation in the first place. There should not be much difference in latency between the increased channel BW and carrier aggregation options.

11. Regarding carrier aggregation inefficiency, TELUS (paragraphs 25-28) mentions the channel utilization for different channel BWs: 95.4% for a 40 MHz channel vs. 98.3% for a 100 MHz channel. So, for the same total BW, a single wideband channel is somewhat more efficient than several non-contiguous smaller carriers. ISED must weigh the slight increase in utilization against the huge benefits that the flexibility of shared spectrum brings in the way of innovation and broader spectrum usage. With CA, all operators (MNOs, regional carriers, WISPs, utilities and industry) can exploit fragmented spectrum, of different BWs, to build a system with higher capacity.
12. In terms of signaling overhead for carrier aggregation, it could be somewhat higher than a single wideband carrier – e.g. due to control and feedback information sent per each carrier. However, the increase in signaling overhead would not be significant especially for a small number of component carriers (e.g. up to 5).

Use It or Share It

(i) CBRS-like Licensing Regime

13. Concern about spectrum concentration is an issue echoed in many submissions (e.g., CEA, Cogeco and Shaw). As noted in our submission, lack of available spectrum to serve the demand for private networks is the biggest challenge faced by Redline and its industrial and commercial clients. There are no bands available that are easily accessible by industrial users with the kind of robust technological and device ecosystem that will allow private networks to flourish in Canada. At the same time, the vast majority of licensed spectrum remains unused in vast areas of Canada, with the final arbiter of how that spectrum is used being the licensee, most often one of the big 3 MNOs.
14. Shaw's submission (paragraphs 49-53) includes an excellent review of mid-band spectrum holdings that demonstrate the strangle-hold the biggest providers have over these scarce resources. The company notes that the incumbents were gifted up to 60 MHz of spectrum in the 3.5 GHz range that have gone significantly underutilized for years. In their words:

The incumbents' already-significant advantage in mid-band spectrum holdings was exacerbated by the Department's Decision on Revisions to the 3500 MHz Band. The decision allowed incumbent fixed wireless access licensees, which include the Big 3, to convert a sizable amount of their existing fixed spectrum holdings in each service area (up to 60 MHz) to significantly more valuable flexible use spectrum licences. Moreover, this advantage could

be further compounded if any flexible spectrum licences issued to non-incumbent operators are allowed to be sold to incumbents who are able and willing to pay anti-competitive foreclosure prices. (Shaw submission paragraph 53)

15. As ISED is aware, 3500 MHz spectrum is not the only spectrum that the MNOs acquired outside auction, as noted by Shaw. The 850 MHz cellular band and the 1900 MHz PCS band were also acquired by these incumbents either as outright gifts from the Department or through acquisitions (TELUS of Clearnet and Rogers of Microcell). As noted in the Cogeco submission (as it was in Redline's), much of this spectrum has gone unused in vast areas of the country. With MNOs acting as final arbiters of all this unused spectrum, innovation in industrial IoT in Canada has lagged behind other jurisdictions while mining camps and other potential users continue to be challenged when it comes to implementing state of the art networks.
16. Holding an auction on the entire 3800 MHz band, without set-aside, as proposed by the MNOs, would certainly result in concentrating much more spectrum in their hands.
17. Therefore, we and other like-minded stakeholders from a diverse cross section of the industry are proposing the implementation of a CBRS-like regime that allows incumbent WISP providers to keep their spectrum while transitioning to new technologies (see below for more on this) while the rest of the spectrum (280-300 MHz) should be auctioned as PAL spectrum, with a set-aside in each Tier 5 license area of 30 MHz for non-incumbents and industry users.

(ii) Mandatory Subordination

18. The submissions of the large MNOs clearly show that they equate their interests with that of the Canadian national interest. In many ways, these companies have made great contributions to the Canadian landscape, not the least of which is their significant investment in first class networks and systems. However, what is good for the goose is not necessarily good for the gander. While companies like Redline struggle with gaining access to frequencies for their clients in rural and remote locations, the MNOs continue to sit on hundreds of megahertz of unused spectrum, thereby representing the largest obstacle to the unleashing of innovation in industrial 5G in Canada.
19. In our discussions with officials at ISED, it is clear that the Department recognizes this as a significant issue. However, the tools at hand (voluntary subordination and RP-19) have proven inadequate and outdated and new solutions must be sought and implemented to ensure spectrum is utilized to the fullest extent possible to finally unleash both innovation and competition in rural areas of the country.

20. The optimal solution, as noted above, is to implement a shared CBRS-like licensing regime in the 3800 MHz band. In our experience, where CBRS has been implemented (the U.S. and Japan) not only has the spectrum access issue been solved, but, as a result, a huge explosion of innovative applications and use cases have been unleashed. This will undoubtedly occur in Canada as well.
21. Should ISED decide not to implement a CBRS licensing regime in the entire 3800 MHz band, we believe mandated spectrum sharing and repatriation should be instituted instead. Under such a regime, any spectrum licensed to an incumbent that has gone unused for at least five years should be subject to automatic repatriation by ISED or, at the very least, mandatory subordination on a first-come, first-served basis. This way, spectrum disenfranchised players such as Redline and its clients or smaller carriers can compete on a level playing field with the incumbents when opportunities arise to serve industrial clients or small, remote communities. As stated in our initial submission, the MNOs cannot be all things to all people. The field needs to be opened to smaller, nimbler, more disruptive players so that innovation can flourish.

WBS Incumbents Should NOT Be Displaced – There Is a Better Way

22. The majority of submissions are against ISED's proposed Option 2, with only the MNOs and a few others in favor. Bell (along with Nokia) proposes WBS users be moved to 3400-3450 MHz instead of 3900-3980 MHz (the Consultation's Option 2) so as to leave as much spectrum as possible in the 3800 MHz band available for flexible use 5G requirements.
23. We suggest that either proposition will significantly damage the businesses of WBS incumbents, as stated in their own submissions (BCBA, CanWISP, Bragg etc.). By extension, this will also affect their subscribers that, we understand, number in the hundreds of thousands.
24. Migrating WBS users to the 3900 MHz range will, by definition, require a forklift replacement of their current hardware, as noted explicitly by Bragg in their submission. In addition, it will likely take four to five years to clear the 3900 MHz spectrum, meaning the earliest the WISPs can be expected to migrate and begin offering services is around 2026-2027. In the meantime, due to the ISED-proposed moratorium on new licenses, these players will be severely restricted in their ability to operate their businesses; thus, aside from jeopardizing the viability of hundreds of small businesses and detrimentally affecting myriads of rural customers, Option 2 runs counter to ISED's mandate of increasing broadband access in rural areas as it would have the opposite effect.
25. Regarding Bell's proposal, while re-tuning equipment to the 3400 MHz range is theoretically possible, it would still require a complete change-out of subscriber radios (for which the UBF does

not provide funding). Additionally, there is a question of interference to and from radar installations that operate within that band.

26. With a CBRS-like licensing regime, on the other hand, it is possible to provide for all interests. Assuming a Tier 5 license area division for the 3800 MHz auction, the incumbents would have the opportunity to acquire spectrum on a priority basis (i.e., PAL spectrum licenses) within urban and suburban areas where they need it the most, while in small towns and rural areas, smaller carriers (WISPs, etc.) and industrial players will be able to access spectrum either on a GAA or PAL basis.
27. Setting aside the 3650-3700 MHz range for WBS incumbents would be the fairest approach for these providers, who have been instrumental in providing broadband services in rural and remote areas of the country. It would give them time to transition to the new TDD technology in an economically efficient manner.

Balance of Harm

28. To sum up, the balance of harm is not equal. On the one hand, Option 2 will severely damage hundreds of businesses and curtail broadband deployment for years to come. On the other hand, Option 1 coupled with a shared licensing regime would allow all companies to access as much spectrum as they need where they require it the most and, as was the experience in Japan and the U.S., a slew of innovative new offerings and applications will surely result. The minor potential downside in terms of slightly lower efficiency due to the need for channel aggregation certainly pales in comparison to the great benefits associated with our proposal. The choice is clear for the vast majority of respondents and we trust that it will be for ISED will as well.
29. All of which is respectfully submitted.