



CHRISTINE J. PRUDHAM
EXECUTIVE VICE PRESIDENT, GENERAL COUNSEL
DIRECT LINE: 905-944-7952
E-MAIL: cj.prudham@corp.xplornet.com

September 15, 2017

Innovation, Science and Economic Development Canada
c/o Senior Director, Spectrum Licensing Policy Branch
235 Queen Street (6th Floor, East Tower)
Ottawa, Ontario K1A 0H5

Via email: ic.spectrumbauctions-encheresduspectre.ic@canada.ca

Canada Gazette, Part I, July 15, 2017
Notice number SLPB-004-17

Consultation on Releasing Millimeter Wave Spectrum to Support 5G

These comments are filed by Xplornet Communications Inc. (“Xplornet”) in response to the above-referenced consultation. Xplornet welcomes the opportunity to comment on the proposed licensing framework for licences in the above noted bands.

In the pages that follow, Xplornet has commented on the issues raised by Innovation, Science, and Economic Development Canada (“ISED”) in its consultation document.

Yours truly,

A handwritten signature in blue ink, appearing to read "Christine J. Prudham", is written over a light blue horizontal line.

Christine J. Prudham

CJP/jm
Attachment

Consultation on Releasing Millimeter Wave Spectrum to Support 5G

Xplornet welcomes Innovation, Science and Economic Development's (ISED) consultation process on releasing millimetre wave spectrum in the 28 GHz, 37-40 GHz and 64-71 GHz frequency bands to support the deployment of fifth generation (5G) wireless networks and systems. This is the start of an exciting new process for Canadian wireless carriers that will make significant quantities of new spectrum available to meet the growing needs of Canadian consumers.

Xplornet is generally supportive of ISED's proposals with respect to the millimetre wave spectrum. However, as some of this spectrum is already being used for other purposes, care must be taken to ensure that existing satellite services are not impeded by the new uses proposed for the spectrum during the life of existing satellites and that the regime allows for expansion of satellite services as competition grows and users demand faster speeds and unlimited data plans, just the same as terrestrial services.

On the whole, Xplornet believes that the measures proposed by ISED will adequately protect incumbent users. Xplornet favours an approach that permits satellite and terrestrial service providers to mitigate interference by engaging in coordination discussions and practices. This means there must be a balanced approach to the use of the spectrum that equally respects the operations of satellite and terrestrial networks.

Details on Xplornet's position on each of the issues raised by ISED in the consultation paper are addressed in the Xplornet's answers to the questions posed by ISED below.

Question 4-1: Given the disruptive nature of 5G, will new business models and network applications develop that may require policy and regulatory consideration from ISED? Please describe potential new business models and network applications as well as their benefits to Canadians.

While new services will inevitably evolve in the 5G environment, what is important at this stage is to develop a spectrum policy that will facilitate this evolution. Business models change rapidly, as evidenced by the evolution of the distribution of music from a download-centric model to locker services to cloud services to streaming services, all in the span of less than a 20 year spectrum licence. These changes alter the demand for the networks that provide access services, which have also undergone three iterations of technology changes in that same time. Given change is inevitable in the business models using 5G technology, spectrum policies should be based on principles of sound public policy and should not be tailored to any particular service or business model.

What is important at this stage is to develop a spectrum policy that is flexible in giving carriers and users the ability to use the spectrum for diverse applications - many of which are not foreseeable at this time.

It would be a mistake to allow a 2017 snapshot of services and business models to guide this process.

Satellite services will be part of the anticipated 5G ecosystem or network of networks for at least the next 20 years. As part of the ongoing standards studies and various 5G vision discussions, satellite services are increasingly being seen as part of the solution. Consequently, both satellite and terrestrial networks need to be addressed in the policies.

Question 5-1: ISED is seeking comments on developing a flexible use licensing model for fixed and mobile services in the 28 GHz and 37-40 GHz frequency bands, and allowing licence-exempt use of the 64-71 GHz frequency band ahead of WRC-19 and before 5G technology standards are finalized.

Xplornet agrees with a flexible use licensing model for fixed and mobile services in the 28 GHz and 37-40 GHz bands. “Fixed” in this context is understood to include both point-to-point and point-to-multi-point. This is an important consideration for Xplornet. This regime should take into account existing users’ requirements, including satellite services, that are growing and need additional spectrum, like 28 GHz and 37-40 GHz, for gateways and user terminals, as competition increases and consumer broadband requirements expand, just like for terrestrial services. Similarly, in areas without satellite ground stations, there is an opportunity to put this spectrum to use for terrestrial services.

Xplornet agrees with ISED’s plans to allow licence-exempt use of the 64-71 GHz frequency band ahead of WRC-19 and before 5G technology standards are finalized, provided that this use does not tie up the spectrum for more than 3 to 5 years.

Question 6-1: ISED is seeking comments on the changes proposed above to introduce flexible use licensing in the 28 GHz band, including consequential changes to the CTFA domestic 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.

Xplornet is in favour of ISED’s proposal to introduce flexible use licensing in the 28 GHz band, including consequential changes to the CTFA domestic 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.

Flexible use licensing should result in more efficient use of this spectrum for a wider range of applications and services. Xplornet believes that coordination that equally balances the interests of satellite and terrestrial users of the spectrum is the answer to interference issues.

Question 6-2: ISED is seeking comments on the moratorium for new site-specific fixed service licences as described above.

It is unclear to Xplornet whether the proposed moratorium applies to both earth stations and terrestrial site-specific fixed services. Xplornet agrees with the moratorium provided that it does not apply to terminals that use the satellite services. The moratorium should be lifted at the end of the process.

Question 6-3: ISED is seeking comments on its proposal to adopt the band plan (as shown in figure 3 above) in the 28 GHz band.

Xplornet agrees with the band plan shown in figure 3.

Question 6-4:

A. ISED seeks comments on its proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the 28 GHz band when a pre-determined trigger threshold is exceeded.

Xplornet agrees with this proposal provided the process of coordination recognizes the equal balance between satellite and terrestrial users. This will increase the efficient use of spectrum in the 28 GHz band.

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

Xplornet believes that the trigger should be distance. The distance does not have to be very large. Existing satellite earth stations should be grandfathered, including replacement earth stations for those already in place.

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

Xplornet does not believe that it is practical to shield its gateways. If ISED grandfathers existing FSS earth stations, it should not be necessary to adopt shielding. These locations are known and new terrestrial users of the spectrum can design networks around them.

Question 6-5:

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 28 GHz band.

Designing the location of FSS earth stations to work with a satellite is a complex and difficult process that includes not only terrestrial considerations but also coordination with

other satellites in adjacent orbital slots. Further, FSS earth stations require significant fiber connections not typically found outside of urban or near-urban areas. As a result, there are already significant constraints on the potential geographic areas for new FSS earth stations. Subject to its comments below, Xplornet does not believe there should be geographic restrictions on future locations of FSS earth stations.

Xplornet also knows that terrestrial networks involve significant investments and a network operator requires certainty that the facilities invested in will not have to be removed to accommodate another party. For this reason, there should be some restrictions on where new FSS earth stations can be deployed in the 28 GHz band to protect terrestrial services.

At a minimum, existing FSS earth station locations should be permitted to continue to operate and new equipment for new or replacement satellites added. Existing satellite beams should be protected to prevent curtailing existing satellites' use and capacity. Given these locations are known and already will require terrestrial operators to coordinate, future deployments at these locations should be freely permitted.

Where a satellite operator is seeking to deploy a new FSS earth station at a new location, the operator should be required to consider the terrestrial networks that may be deployed. The FSS earth stations and user terminals for a new satellite should be allowed anywhere that they can share spectrum with existing terrestrial 5G spectrum uses. Just as terrestrial operators need to prove they can operate a new terrestrial deployment in proximity to an existing FSS earth station, it would be incumbent on the satellite operator to prove it can operate the new FSS earth stations in proximity to any existing terrestrial deployments.

Given it takes typically three years from design of a satellite to deployment, ISED may wish to consider a process that allows satellite operators to advise terrestrial operators of the proposed location of future FSS earth stations once the design of the satellite has been finalized.

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.

A priori geographic restrictions should not be necessary if there are adequate inter-operator coordination arrangements. Generally placement of FSS earth stations is less flexible than terrestrial sites. As discussed in the answer above, FSS sites placement and interference mitigation requirements should be considered on a case by case basis.

Question 6-6: ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services. If limits are proposed, ISED is inviting detailed proposals on why they should be implemented, and what the limits should be.

This should be part of the coordination process. If a terrestrial use will interfere with a satellite beam, emission limits should be used to ensure no interference. Absent an interference issue, it is not necessary to impose emission limits.

Question 6-7: ISED proposes that all existing FSS earth stations and those in applications pending approval for operation would be permitted to continue to operate under the current conditions of licence as described above. Comments are sought on this proposal.

Xplornet agrees with ISED's proposal. It would be wasteful of existing satellite capacity not to allow existing FSS earth stations to continue in operation for the life of the satellite and any replacement satellite. This should extend to any renewals of the FSS earth station licences, as well as relocations within the same general area.

Question 7-1: ISED is seeking comments on the proposal to implement flexible use licensing in the frequency band 37-40 GHz, including the consequential changes to CTFA footnote C51, while continuing to allow for fixed-satellite service (space-to-Earth) in the band.

Xplornet is in favour of ISED's proposal to implement flexible use licensing in the frequency band 37-40 GHz, including the consequential changes to CTFA footnote C51, while continuing to allow for fixed-satellite service (space-to-Earth) in the band. This should serve to improve the efficiency of spectrum usage and increase access to the spectrum.

In addition, Xplornet would encourage ISED to develop the rules for coordination and sharing of spectrum for this frequency band as soon as possible to allow planning for future satellites that may be envisioned to meet the escalating requirements of consumers.

Question 7-2: ISED is seeking comments on whether a moratorium on the issuance of new licences under the New Licensing Framework for the 24, 28 and 38 GHz Bands and Decision on a Licence Renewal Process for the 24 and 38 GHz Bands is required at this time.

Xplornet supports a moratorium, provided that existing satellites can continue to provide service for their actual life. A satellite operator should be able to renew such licences, including for replacement satellites. Licences in the terrestrial service should also be transferable, subject to the *Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licences for Commercial Mobile Spectrum*, DGSO-003-13 June 2013.

Question 7-3: ISED is seeking comments on the proposal to adopt the band plan as shown in figure 7 for the frequency band 37-40 GHz.

Xplornet agrees with this proposed band plan.

Question 7-4:

A. ISED seeks comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the frequency band 37.5-40 GHz when a pre-determined trigger threshold is exceeded.

Xplornet agrees with the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the frequency band 37.5-40 GHz when a predetermined trigger threshold is exceeded. As noted in the answers above, Xplornet believes the coordination activities must equally balance the interests of both satellite and terrestrial operators.

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

Xplornet supports site by site coordination. Coordination triggers could be combination of PFD, distance, and axis and elevation contours, depending on the radio frequency environment. Other interference mitigation techniques (such as shielding) could moot the triggers if they were predetermined.

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

Xplornet does not think that mandating shielding is a practical response. Coordination is the answer to interference issues.

Question 7-5:

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 frequency band 37.5-40 GHz.

A priori geographic restrictions should not be necessary if there are adequate inter-operator coordination arrangements. Generally, the placement of FSS earth stations is less flexible than terrestrial sites. FSS sites placement and interference mitigation requirements should be considered on a case-by-case basis.

Designing the location of FSS earth stations to work with a satellite is a complex and difficult process that includes not only terrestrial considerations but also coordination with

other satellites in adjacent orbital slots. Further, FSS earth stations require significant fiber connections not typically found outside of urban or near-urban areas. As a result, there are already significant constraints on the potential geographic areas for new FSS earth stations. Subject to its comments below, Xplornet does not believe there should be geographic restrictions on future locations of FSS earth stations.

Xplornet also knows that terrestrial networks involve significant investments and a network operator requires certainty that the facilities invested in will not have to be removed to accommodate another party. For this reason, there should be some restrictions on where new FSS earth stations can be deployed in the 37.5-40 GHz band to protect terrestrial services.

At a minimum, existing FSS earth station locations should be permitted to continue to operate and new equipment for new or replacement satellites added. Existing satellite beams should be protected to prevent curtailing existing satellites' use and capacity. Given these locations are known and already will require terrestrial operators to coordinate, future deployments at these locations should be freely permitted.

Where a satellite operator is seeking to deploy a new FSS earth station at a new location, the operator should be required to consider the terrestrial networks that may be deployed. The FSS earth stations and user terminals for a new satellite should be allowed anywhere that they can share spectrum with existing terrestrial 5G spectrum uses. Just as terrestrial operators need to prove they can operate a new terrestrial deployment in proximity to an existing FSS earth station, it would be incumbent on the satellite operator to prove it can operate the new FSS earth stations in proximity to any existing terrestrial deployments.

Given it takes typically three years from design of a satellite to deployment, ISED may wish to consider a process that allows satellite operators to advise terrestrial operators of the proposed location of future FSS earth stations once the design of the satellite has been finalized.

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?

As indicated above, Xplornet does not think that geographic restrictions are necessary. It prefers to rely on coordination between the carriers.

Question 7-6: It is proposed that, should SRS and/or MSS systems be deployed, flexible use licensees in the band 37.6-40 GHz may be subject to technical provisions to facilitate co-existence. Comments are sought. ISED notes that any such technical provisions would be established through a future consultation process.

Xplornet agrees that the technical provisions will need to be established for flexible use between SRS and/or MSS and terrestrial users of the spectrum to permit all services to co-exist without interference.

Question 7-7: ISED is seeking comments on:

A. the options and implications for the treatment of incumbent licensees currently holding Tier 3 licences, the percentage that would apply to option 1 and supporting rationale.

As a general principle, where there has been significant investment and networks are operational, Xplornet supports grandfathering the incumbent licensees in order to provide for continued service to Canadians who are receiving service today.

B. the options and implications for the treatment of incumbent licensees currently holding FCFS licences and supporting rationale.

For the same reason noted in the answer to A above, where there has been significant investment and networks are operational, Xplornet supports grandfathering the incumbent FCFS licensees.

Question 8-1: ISED is seeking comments on its proposal to designate the band 64-71 GHz for licence-exempt operations on a no-protection, no-interference basis.

Xplornet does not support licence exempt operations. This approach leaves ISED and potential users effectively blind to the users in a frequency band, which can become problematic if changes need to occur or frequency coordination is required. At a minimum, Xplornet believes ISED should slightly modify its proposal to designate the band 64-71 GHz for light-licensed operations, similar to the policies in place for the 3650 MHz band. Practically, this allows for harmonization for this spectrum with the approach taken by the FCC in the United States and yet continues to give ISED visibility into the operators within the band. This will still permit North American-wide service to be developed.

Question 9-1: ISED is seeking comments on:

A. Whether flexible use access in these bands should be exclusively licenced or licence-exempt.

Xplornet believes that flexible use access to the 28 GHz and 37-40 GHz bands should be exclusively licensed. The reason for this is that it takes significant capital to build out

systems and this build out cannot be planned properly without exclusive licences. The necessary capital cannot be raised without the knowledge that spectrum will be available subject to coordination requirements. Absent exclusive licences, Xplornet foresees a chaotic marketplace in which many carriers are using the spectrum in adjacent areas and it is difficult, if not impossible, to establish a rational network. Also as indicated in the response above, a licence-exempt environment makes coordination difficult because the users of the spectrum in a specific location are not known.

B. If a licencing approach is proposed, which types of licences (radio licences, spectrum licences with user-defined licence areas, spectrum licences with service areas for competitive licensing, or others) are expected to best lend themselves to licensing flexible use in the 28 GHz and 37-40 GHz frequency bands in order to support a variety of 5G technologies, applications and business cases?

Xplornet favours spectrum licences issued for Tier 4 areas. Tier 4 is the lowest geographic tier that would enable a viable network to be established.

C. Whether a licence-exempt dynamic access using data base should be implemented in all, or portions of the 28 GHz, 37-40 GHz, particularly in the band 37-37.6 GHz.

Xplornet does not favour a licence-exempt dynamic access mechanism for access to the 28 GHz, 37-40 GHz and 37-37.6 GHz bands. It is impossible to plan capital expenditures under such a system, which is a necessary precondition to raising capital to deploy networks. An operator would never know how much spectrum it has to work with from minute-to-minute under this system. While theoretically interesting, it does not allow for practical capacity planning to provide Canadian customers with a consistent quality service, particularly at peak usage times.

Question 9-2: If an exclusive licensing approach is implemented, preliminary comments are sought on the benefits and risks related to longer licence terms for these frequency bands.

Xplornet favours longer term licences comparable to other spectrum that is competitively licensed. Twenty year terms are preferable to 10 year terms. Longer term licences provide the necessary time to recoup capital needed to build out these networks. Such licences should be accompanied by deployment requirements to ensure that spectrum does not lie idle.

Question 9-3: If an exclusive licensing approach is proposed, ISED is seeking preliminary comments on possible measures that could support competition in light of the current conditions in the Canadian wireless service market and anticipated development and deployment of 5G services if flexible use licensing is developed through a spectrum licensing model.

Xplornet believes that similar measures to those employed in other auctions should be used to support competition among licensees. These measures should include spectrum caps and set-asides to ensure that the larger carriers do not purchase all of the spectrum and that high auction prices do not preclude smaller players and new entrants from purchasing adequate quantities of the spectrum to support their competitive entry and growth.

**** End of Document****