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July 12, 2018

BY ELECTRONIC MAIL

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Innovation, Science and Economic Development Canada
c/o Senior Director, Spectrum Licensing and Auction Operations
235 Queen Street, 6th Floor
Ottawa, Ontario K1A 0H5

Dear Sir/Madam,

**Canada Gazette Notice No. SLPB-004-18, June 2018
Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use
and Preliminary Consultation on Changes to the 3800 MHz Band**

Pursuant to the procedures set forth in the above-referenced notice of consultation, please find attached the comments of XplorNet Communications Inc.

Yours truly,

A handwritten signature in blue ink, appearing to read "Christine J. Prudham".

Christine J. Prudham

CJP/
Enclosure

Canada Gazette Notice No. SLPB-004-18, June 2018

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

**Comments of
Xplornet Communications Inc.**

July 12, 2018

EXECUTIVE SUMMARY

1. Xplornet Communications Inc. (“Xplornet”) welcomes this opportunity to comment on Innovation, Science and Economic Development Canada’s (ISED) *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. This consultation comes at a critical juncture in the evolution of the telecommunications industry in Canada, and it is one that has significant ramifications for the industry.
3. Wireless broadband has become a vital element in the delivery of the Internet to Canadians in both urban and rural Canada. The dramatic increase in consumption of video services via the Internet has led to a requirement for more bandwidth and hence, more spectrum, to support broadband networks. This is just as true of fixed wireless and satellite services as it is of mobility services.¹
4. Canada is the world’s second largest land mass, and one of the least densely populated countries in the world, with only 3.7 Canadians per square kilometer. To ensure all Canadians have access to today’s digital world, a diversity of technologies (fibre, fixed wireless, satellite, and others) have traditionally been deployed, of which wireless and satellite require spectrum as a critical resource. Canada’s size and lack of population density make it unique.
5. Rural operators have used and continue to use the 3500 MHz spectrum band to deliver wireless service to hundreds of thousands of homes, and millions of Canadians, who live in low density areas in rural Canada.
6. As technology evolves with the adoption of 5G applications, the need for more spectrum across all bands, including the 3500 MHz Band, will require ISED to strike a balance between the needs of *all* Canadians, regardless of how they connect online or where they choose to live.
7. Finding that balance and ensuring rural Canadians are able to enjoy the same level of services as in urban Canada, both today and tomorrow, is at the core of this

¹ By 2021, Internet household traffic is projected to generate 142.6 GB per month – an increase of almost 2.7 times from the 63.6 GB per month in 2016. In Canada, it is projected there will be 2 million households (18.6% of all Internet households) generating more than 500 GB per month of data in 2021, with over 650 households generating more than a terabyte of data per month. Meanwhile, Canada’s “fixed/Wi-Fi” household traffic will comprise 54.1% of total Internet traffic in 2021, while mobile Internet traffic will comprise just 5.6%. *Cisco VNI Forecast*, http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html#

Consultation. It is against that backdrop that Xplornet submits its comments regarding proposed revisions to the 3500 MHz Band.²

8. In summary, Xplornet's submission advances the following:

- **The Consultation fails to strike the balance needed between rural and urban operators** by proposing to take spectrum away from rural operators who have met their conditions of licence and are using the spectrum to connect rural Canadians. Since there are no alternative spectrum bands available to which Xplornet and other providers can move their rural customers, the result of the options proposed will mean the reduction or disconnection of service to 200,000 or more rural households, with Xplornet alone forfeiting between 25% - 66% of its spectrum in the 3500 MHz Band.
- **The Options proposed in the Consultation are without precedent.** It would appear to be the first time ISED has proposed a policy that would take spectrum away from existing providers that are making use of that spectrum, without providing viable alternatives to maintain and expand their services. Conversely, it is difficult to imagine a comparable scenario involving mobile carriers being required to return two-thirds of their mobile spectrum that is in use.
- **The first objective of the new 3500 MHz spectrum policy should be to do no harm to rural Canadians - to preserve the rural connectivity that has been achieved and to facilitate the provision of new 5G services to them.** Instead, the policy permits mobile licensees to displace existing operators out of the spectrum that is used to serve these rural customers without making sure there is alternative spectrum available to them. This will leave rural Canadians, who currently lack other options, with a less robust Internet service and force them to once again be left behind in the digital economy.
- **The introduction of 5G services in rural Canada will be compromised:** An indefinite delay of 5G services in rural areas will be inevitable due to the lack of spectrum available to support this technology. That spectrum will ironically be taken away in the name of supporting urban 5G mobile deployment. Fixed 5G technology equipment is currently scheduled to arrive in rural Canada as early as late 2019, which is one year earlier than in urban Canada. At best, the proposed options limit rural Canadians to whatever services they are currently receiving. For once, rural Canadians have an opportunity to experience new services in advance of urban

² In this submission, "3500 MHz Band", "the Band" and "3500 MHz spectrum" refer to the spectrum between 3450 MHz and 3650 MHz, the "3650 MHz Band" refers to spectrum between 3650 MHz and 3700 MHz, the "3800 MHz Band" refers to spectrum between 3700 MHz and 4200 MHz.

Canadians. This opportunity would be thwarted by the two options proposed.

- **It is wrong to assume that there are untapped efficiencies to be gained for rural operators that would compensate for the loss of such a critical mass of spectrum.** The Consultation assumes that existing licensees will be able to get by with significantly less spectrum due to efficiency gains inherent in flexible use spectrum used for 5G services. The efficiency gains that will result from 5G technology come mainly from the implementation of larger bandwidth channels. The proposals in the Consultation do not include large blocks of contiguous spectrum for 5G services that are likely necessary for any efficiency gains to be realized. With household data consumption projected to triple in less than five years, it will be impossible for rural operators to offer comparable levels of service with less spectrum available.
 - **Absent a comprehensive band plan, these proposals do not provide a long term spectrum outlook for Canada:** the proposals in the Consultation do not go much further than a reorganization of the current 3475 – 3650 MHz band, which is already anomalous by international standards. The proposals do not conform to established international standards for LTE (Bands 42 and 43) and 5G (Bands n77 and n78) and therefore do not provide a coherent target for operators and manufacturers. The goal should be to consolidate Bands 42 and 43, and then further expand these bands to the 5G standard. Canada should expand the licence block sizes to be as wide as practical with 50 MHz as the absolute minimum.
 - **There is a clear opportunity to expand the 3500 MHz Band to harness untapped spectrum in the 3700-4200 MHz Band as a logical alternative to what has been proposed.** Freeing up more spectrum, as has been proposed by the FCC in the United States, eliminates the need to take spectrum away from existing licensees in Canada and would help to strengthen service to rural Canadians rather than diminish it.
 - **Even without opening up the 3700-4200 MHz Band, there is a way to protect existing service providers like Xplornet and the other rural service providers in Canada.** Xplornet has included an alternative proposal to ISED that would preserve the gains made to date in rural Canada, and continue the process of improving rural service, while still allowing an auction of additional spectrum to proceed. This proposal would better serve all Canadians, while producing more competition in the provision of 5G services.
9. Xplornet elaborates on these points in detail in the pages ahead.
10. To provide a framework for Xplornet's responses, it is important to comment on an issue not addressed in this Consultation. Xplornet believes that a band plan needs

to be developed for the 3500 MHz Band and 3800 MHz Band to allow for all parties to provide meaningful commentary on how spectrum should be allocated for 5G technologies. To avoid anomalous allocations, Xplornet suggests that ISED consider a long term outlook that aligns Canada with the international standard, which is expected to focus on Band n77 (3300 MHz to 4200 MHz) and work toward that goal through a phased approach that first aligns with Bands 42 (3400 MHz to 3600 MHz) and 43 (3600 MHz to 3800 MHz) for the LTE anchored roll out of 5G technology and then Band n78 (3300 MHz to 3800 MHz) to accommodate the initial equipment anticipated for 5G technology. If Canada focuses on the ultimate goal of allocating the 900 MHz of Band n77 within five years, a band plan can be developed that steps into 50 MHz or 100 MHz blocks and all licensees can be arranged according in Bands 42 and 43 in the next 18 months.

11. Xplornet supports Canada pursuing an approach that aligns with Band n77. Even if the 100 MHz from 3300 to 3400 MHz is not available in Canada, using Band n77 as the guide for 3400 MHz to 4200 MHz will allow for the most efficient arrangement of the licensees in the band and allow operators to make use the economies of scale associated with purchasing the equipment designed for the anticipated global standards.
12. In the interim, Xplornet believes the 400 MHz in Bands 42 and 43 should be, to the greatest extent possible, arranged today in a manner consistent with the global standards for these bands and Band n78 and that the 3700 MHz and 3800 MHz can and should be made available at the time of the 3500 MHz Band auction.

XPLORNET HAS PIONEERED USE OF 3500 MHZ SPECTRUM AND CONTINUES TO USE IT TO INNOVATE IN RURAL CANADA

13. In recent years, there has been much discussion globally on how to leverage the 3500 MHz spectrum band to support the introduction of 5G services. Xplornet agrees that the 3500 MHz Band can have great value in supporting 5G services along with other frequency bands. Xplornet has recently announced its 5G trial program using 3500 MHz spectrum in rural Canada. Other providers have announced similar initiatives.³
14. Before focusing on the future, it is important to acknowledge how the 3500 MHz spectrum is used today. Xplornet has deployed its licensed 3500 MHz spectrum to provide fast, affordable and reliable fixed wireless access Internet service to Canadians in rural areas where other forms of high-speed access are generally not available. High-speed connectivity to the Internet has become vital to Canadians and has been a priority of the Government of Canada and the CRTC. It is the corporate mission of Xplornet and we have invested close to half a billion

³ See *Huawei enables Bell Canada's Wireless to the Home (WTTH) trials that put Canadian rural customers on the path to 5G*, <https://www.newswire.ca/news-releases/huawei-enables-bell-canadas-wireless-to-the-home-wtth-trials-that-put-canadian-rural-customers-on-the-path-to-5g-675262803.html> and *Remarks by Allison Lenehan, President and CEO of Xplornet, at the Canadian Telecom Summit*, <https://www.youtube.com/watch?v=cPY-oBS-n38>.

dollars over the last decade to build extensive wireless networks serving customers across Canada using the 3500 MHz Band. That infrastructure is supported by over 2,000 network technicians, dealers and installers across the country. What started as a small business in rural New Brunswick has grown into a made-in-Canada champion of rural broadband in our telecommunications sector.

15. Xplornet has become one of Canada's largest rural broadband providers and the largest user of 3500 MHz spectrum. Over 900,000 rural Canadians connect to the Internet through Xplornet every day. To deliver that service, the primary spectrum we use is the 3500 MHz spectrum that Xplornet acquired from third parties like TELUS. This spectrum has been proudly put to its intended use by Xplornet for a decade to provide fixed wireless access broadband service for Canadians. This is what the spectrum was originally licensed for and any change in use from this original purpose represents a fundamental change. Any new licensing policy that moves the industry towards flexible use spectrum in the 3500 MHz Band must therefore protect those carriers that deployed the spectrum in accordance with the original policy and take care to ensure that no customer currently served by fixed wireless access, loses his or her service.
16. Xplornet pioneered the use of 3500 MHz spectrum for broadband services in Canada through innovation, technology investment and hard work. Xplornet was an early member of the Global TDD Initiative ("GTI") while all the Canadian mobile providers were focused solely on FDD spectrum. Our global leadership on the TDD deployment of 3500 MHz spectrum included co-chairing the GTI 3.5 GHz Subcommittee which set the standards influencing the development of the equipment ecosystem for the 3500 MHz Band. In fact, Xplornet was the first in North America to test LTE TDD in the 3500 MHz Band, opening the door for the 5G developments that we are working on for tomorrow.
17. Today, Xplornet has fully deployed its 3500 MHz spectrum to serve Canadians located in all corners of the country. Our LTE network carries more data per day than either of the mobile networks of Bell or TELUS, using a fraction of the spectrum.⁴ That network is a Canadian-engineered, national network that has been actively deployed in order to ensure rural Canadians, just like urban Canadians, can connect to what matters to them. Xplornet has also used its wireless access network to provide a competitive IP-based home phone service to Canadians.
18. In short, Xplornet pioneered the innovation of the 3500 MHz Band and has done everything the Government of Canada asked of its 3500 MHz spectrum licenses. Every licence condition has and is being met and the Government's policy objective of providing fixed wireless access in rural Canada, the original purpose

⁴ Based on Bell's 9,166,000 and TELUS's 8,911,000 pre and post-paid mobile subscribers in their respective Q4 2017 earnings reports, multiplied by the average monthly data consumption of 1.2 GB per month for mobile users identified in the 2016 CRTC Communications Monitoring Report. This is contrasted with Xplornet's subscribers on its LTE network, multiplied by its average monthly LTE data consumption per user.

for licensing the 3500 MHz spectrum, is being fulfilled. It runs completely counter to the Minister's public statements and ISED's policy objectives for rural connectivity to propose taking away the very spectrum rural operators like Xplornet have spent a decade developing. It is also directly at odds with the innovation agenda of the Government of Canada.

CONSULTATION OPTIONS FAIL AT ISED'S POLICY OBJECTIVES

19. Given its reliance on 3500 MHz spectrum to provide service in rural Canadians, Xplornet is extremely concerned that, as written, the Consultation proposes to undo much of what has been accomplished in the last decade to connect Canadians and bring Internet services to those living outside Canada's urban centres. The policy proposed in the Consultation disproportionately favors the interests of large, urban mobile providers at the expense of Internet users in rural Canada.
20. ISED's stated policy objectives for the 3500 MHz Band are to:
 - Foster innovation, investment and the evolution of wireless networks by enabling the development and adoption of 5G technologies;
 - Support sustained competition, so that consumers and businesses benefit from greater choice; and
 - Facilitate the deployment and timely availability of services across the country, including rural areas.
21. The Consultation's proposed options fail at ISED's policy objectives. Instead of promoting innovation and competition, it would appear the Consultation is aimed at doing precisely the opposite: crippling companies that have invested and innovated to deliver Internet to hundreds of thousands of rural Canadians who rely on their rural ISPs to connect them to what matters every day. Each of ISED's three policy objectives: the enabling of 5G services, increased competition, and improved Internet services would become fiction for rural Canadians. In analyzing the consultation and its proposed options, Xplornet is not aware of any precedent where a regulator or government body has proposed taking away spectrum of this quantity, resulting in such a fundamental impact on consumers, without a contingency plan for incumbent operators.
22. The result of this Consultation, if either proposed option is implemented, will mean the reduction or disconnection of service to approximately 200,000 rural households, as a result of Xplornet forfeiting between 25% - 66% of its spectrum in the 3500 MHz Band. Beyond this, the consequences also include:
 - a significant deepening of the urban rural digital divide in Canada by taking spectrum away from licensees who have met their conditions of licence and are using that spectrum to connect Canadians;

- an indefinite delay of 5G services in rural areas due to the Government's failure to put in place the conditions necessary to insure the availability of this technology, which is currently scheduled to arrive in rural Canada as early as late 2019; and
 - the significant erosion of competition by taking away spectrum from fixed wireless providers and offering no alternatives.
23. These negative impacts of the policy are unnecessary and counterproductive. It should be a fundamental principle that any new policy should do no harm to existing service providers and their customers. Rural Canadians who rely on 3500 MHz spectrum must not be disconnected or suffer a reduction in service. Any new policies must respect and accommodate their continued use of this spectrum. Otherwise ISED will do serious harm to both these customers and its own policy objectives to further rural connectivity.
24. The Government of Canada has historically been a major catalyst to incent the extension of wireless broadband networks in rural Canada. Recently, its Connect to Innovate Program invested half a billion dollars "to help bring high-speed Internet to rural and remote communities [where] challenging geography and smaller populations present barriers."⁵ The Minister has called access to high-speed Internet "essential" and "a basic tool all Canadians should have access to, regardless of their postal code."⁶
25. The proposed new policy is completely at odds with the steps taken by the Government over the past decade to advance rural broadband and threatens to undo the advances made to date. It is against this backdrop that ISED released the Consultation.

FUNDAMENTAL ERRORS UNDERPINNING THE PROPOSED POLICY

26. The Consultation is based on three factually incorrect assumptions:
- (1) that mobile 5G deployment will happen first, in advance of fixed wireless;
 - (2) that only operators who do not currently hold licensed spectrum in the 3500 MHz Band can innovate and deploy 5G for Canadians; and
 - (3) that the introduction of 5G will somehow create efficiencies that will offset the loss of 3500 MHz spectrum and the reduction of service in rural Canada.

⁵ *Innovation, Science and Economic Development Canada*, <https://www.canada.ca/en/innovation-science-economic-development/programs/computer-internet-access/connect-to-innovate.html>

⁶ *Government of Canada announces Newfoundland and Labrador communities to benefit from Connect to Innovate funding*, https://www.canada.ca/en/innovation-science-economic-development/news/2018/01/government_of_canadaannouncesnewfoundlandandlabradorcommunitiest.html.

27. Each of these assumptions is incorrect:

(1) It is not true that 5G services will first be introduced by mobile service providers rather than by fixed wireless service providers. In fact, 5G fixed wireless equipment is to be commercially available by mid-2019, while mobile 5G equipment is not anticipated to be available until 2020. Any new policy should not arrest the fixed wireless development to make it unnecessarily wait for mobile development.

(2) Innovation and the deployment of 5G will not be set back because one carrier does not have one of the 5G spectrum bands. If this were true, ISED faces the task of applying these same principles of reclaiming and reallocating spectrum to each of the 5G spectrum bands, including 700 MHz, 800 MHz and AWS spectrum, as examples. Xplornet is already testing and preparing to use our 3500 MHz spectrum to provide 5G services, and Bell and Rogers have announced the same. The new policy threatens to ignore and negate these technological advances.

(3) Finally, it is not true that spectral efficiency gains will offset the loss of 3500 MHz spectrum. Based on Xplornet's discussions with companies leading the development of 5G equipment, we understand that to gain the efficiencies promised by 5G, the spectrum has to optimally be configured in 100 MHz blocks and, at a minimum, in 50 MHz blocks. Using 5G equipment with any smaller spectrum blocks will likely not result in efficiency gains. In short, it is very unlikely the efficiency gains from using 5G technology in the 10 MHz block sizes suggested in the Consultation will materialize and even less likely sufficient efficiency gains will occur that can offset the loss of spectrum as proposed in Option 1 and Option 2.

28. In establishing spectrum policy, ISED must strike a reasoned and proportioned balance between the needs of all Canadians. While the Consultation Paper recognizes the role that 3500 MHz spectrum has played in enabling the provision of fixed wireless access services to Canadians, it has nonetheless proposed to claw back large portions of this spectrum to be re-auctioned for "flexible use". In doing so, ISED has wrongly assumed that this claw-back will not result in any loss of service to rural fixed access users.

"43. ISED notes that incumbent licensees will be required to reduce their spectrum holdings and transition to different frequencies in the new band plan. ISED is of the view that, with improved deployment efficiencies and new technologies, licensees should be able to continue to maintain current service offerings with a reduced amount of spectrum. Many incumbent licensees have been building their fixed wireless networks for over 10 years, since the initial auction process took place in 2004. Under either of the options proposed below, current licensees would be able to continue to provide fixed wireless services with their remaining holdings and, in some cases, to expand their existing networks

or take advantage of fixed 5G technologies to improve their services at any time.” (emphasis added)

29. This is simply not the case. As stated above, no efficiency gain is likely to be technically possible with spectrum blocks of less than 50 MHz. It is false to assume operators can squeeze 25% more efficiency out of 20 MHz of spectrum when equipment manufacturers have suggested there is unlikely to be any efficiency gain at all. Further, not only is Xplornet using the 3500 MHz spectrum to serve its existing customer base - but the growth in traffic on its networks is causing the company to constantly use more spectrum to augment its capacity. Moreover, as ISED is aware, the extension of service to underserved areas continues and is unlikely to be completed for several years. Reducing the spectrum that Xplornet is currently using cannot help but affect service to rural Canadians today and in the future.
30. Xplornet has constantly adopted new technologies to improve spectrum efficiency at every opportunity, moving from 3G Expedience to 4G WiMAX to LTE, taking advantage of efficiency gains as each new technology was developed. Xplornet has been amongst the leaders in the world in these deployments and the development of equipment for the 3500 MHz Band as we have pushed to achieve greater spectrum efficiencies. It is false to assert that there are untapped efficiencies to be gained that would allow for operators to lose such a critical mass of spectrum and maintain existing levels of service, let alone innovate to offer new services.

LEAVING RURAL CONSUMERS BEHIND

31. Xplornet holds at least 50 MHz of 3500 MHz spectrum in most Tier 4 areas and in many areas has 75 MHz, going as high as 125 MHz in a few Tier 4 areas.
32. The Consultation proposes two options:
 - 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; or
 - 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.
33. ISED's first option, to take back two-thirds of existing licensees' licences, would have a devastating impact on Xplornet's ability to serve its customers. By definition, it will result in a reduction in service to rural subscribers of approximately two-thirds. Xplornet could not continue to provide the level of service it provides today with this reduced amount of spectrum.

34. Option 2 would allow incumbent operators to keep up to 50 MHz of 3500 MHz spectrum per licence area. While less damaging than Option 1, it would still significantly penalize rural operators like Xplornet. This option would force Xplornet to return spectrum in approximately 90 Tier 4 areas resulting in a loss of service and loss of capacity for growth to meet the increasing demands of our existing customer base, particularly in Alberta and Ontario. In total, Xplornet would forfeit over 25% of its 3500 MHz spectrum holdings. Under either option, the result will be a loss of service to existing rural customers and an indefinite suspension of our program to rollout 5G services in rural areas.
35. Xplornet notes that in its recent policy direction to the Australian Communications Media Authority (ACMA) released on July 11, 2018,⁷ the Government of Australia imposed a significantly larger cap of 80 MHz in rural licence areas in order to auction spectrum in its 3500 MHz band in 2018. Unlike Australia, which has committed significant public investment through Telstra and subsequently the National Broadband Network (NBN) in order to build out networks in its rural areas, Canada has relied on private investment and, by comparison, limited public subsidy. Despite this, Australia still elected not to impose caps as small as 50 MHz per licence area.
36. Xplornet believes that it is unprecedented for ISED to propose a policy to take spectrum away from service providers that are making extensive and good use of it, without giving service providers a viable alternative to maintain and expand their services.
37. To put this in context, ISED has never previously required any spectrum user to return 25% or more of its spectrum in use. Conversely, it is difficult to imagine a comparable scenario involving mobile carriers being required to return two-thirds of other 5G spectrum bands, such as the 700 MHz, 800 MHz and AWS bands, to make it available for companies such as Xplornet and others to deploy 5G technologies.
38. There is no question that some existing licence holders will view the conversion options proposed by ISED to be a boon. Unquestionably, flexible use spectrum is of more value than fixed wireless spectrum to such licence holders. These carriers will readily convert existing 3500 MHz spectrum licence holdings for flexible use spectrum. This was, for example, likely the case with the Inuksuk partnership of Bell and Rogers who argued back in 2014 for ISED to permit the exchange of fixed licences for flexible use licences if one-third of spectrum holdings were returned to the department.

“E6. IWP does not believe there is any value in differentiating between a mobile or fixed allocation for the 3500 MHz band. Instead, the policy should allow for the flexible use of this band, consistent with the licensing of other

⁷ “5G spectrum auction one step closer,” Statement by the Ministers for Communications and the Arts, Government of Australia, <https://www.minister.communications.gov.au/minister/mitch-fifield/news/5g-spectrum-auction-one-step-closer>.

mobile bands. With that in mind IWP supports the proposal to add a mobile allocation to the 3500 MHz band so that mobile services can be provided by licensees. However, IWP does not believe that adding a mobile allocation represents a fundamental reallocation and, therefore, there is no need for the displacement of existing licensees.

E7. To acknowledge the significant investments in networks by some of the existing licence holders, IWP strongly urges Industry Canada to allow those who have met their conditions of licence to transition to a new mobile licence for two-thirds of the amount of spectrum that they currently hold. This will allow the same licensees to seamlessly transition their customers from fixed services to mobile services and will avoid interrupting the wireless broadband services that these Canadians rely on every day.”⁸

39. But this viewpoint was never held by Xplornet, whose core business is the provision of fixed high-speed Internet services to Canadians.
40. As the largest deployer of 3500 MHz spectrum in Canada, the result would mean Xplornet forfeiting spectrum it uses every day to connect rural Canadians, resulting in the reduction or disconnection of service to approximately 200,000 rural households.

WHO DEFINES ‘URBAN’ VERSUS ‘RURAL’?

41. This reduction or disconnection of service is directly related to ISED’s definition of urban versus rural licence areas. Xplornet is not supportive of splitting the use of the 3500 MHz Band into urban, mid-size and rural licence areas. The methodology used results in over 50% of all Canadians that Statistics Canada considers rural being deemed to live in “urban” areas.⁹
42. In defining licence areas, ISED has combined high density urban areas with low density rural areas. If a small geographic area within a Tier 4 licence is found to be “urban”, then the entire Tier 4 area is deemed “urban”, including the 80%+ of the geographic area that is, in fact, rural.
43. Xplornet notes that approximately 60% of its customers in rural Canada live in areas ISED has defined as mid-sized or “large urban” Tier 4 licence areas (areas with a population centre of either 30,000+ or 100,000+).
44. These rural households are located in communities such as Smith Falls, Ontario (population: 8,780, Tier 4 definition: “large urban”), Beupre, Quebec (population: 3,752, Tier 4 definition: “large urban”), and Elnora, Alberta (population: 298, Tier 4

⁸ Submission of Inukshuk Wireless Partnership, Consultation on Renewal Process for 2300 MHz and 3500 MHz Licences, DGSO-006-12, October 8, 2014, paragraphs E6 and E7.

⁹ *Census Dictionary, Rural Area*, <http://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo042-eng.cfm>

definition: mid-size). Xplornet challenges parties to this Consultation to identify residents of these communities who believe they reside in “urban” Canada.

PAST 3500 MHZ BAND CONSULTATIONS

45. This Consultation is not the first time the Department has reflected on issues pertaining to the 3500 MHz Band.
46. On August 19, 2014, Industry Canada released its *Consultation on Policy Changes in the 3500 MHz Band (3475-3650 MHz) and a New Licensing Process in Rural Areas*, DGSO-003-14.
47. At that time, Xplornet was joined by other rural ISPs as well as Mayors, municipal associations, Members of Parliament and rural residents in opposing the decision to reduce the choice of service in rural Canada.
48. In 2014, Xplornet strongly urged Industry Canada to take a step back from the proposals contained in its position paper in order to properly assess the need for spectrum to provide service in rural Canada.
49. As a result, in October 2014 the Minister issued a public statement stating that “under no circumstances (would the) government take spectrum licences away from any local Internet service provider that is providing Internet service to rural Canadians,” and that “the decisions resulting from this consultation will ensure that the 3500 MHz spectrum band is deployed in the best interests of Canadian consumers, especially those living in rural areas.”¹⁰
50. ISED is presenting near identical proposals in this Consultation. Xplornet notes the following statement made by ISED in paragraph 11 of the current Consultation Paper:

“In 2014, ISED released DGSO-007-14, Decisions Regarding Policy Changes in the 3500 MHz Band (3475–3650 MHz) and a New Licensing Process (referred to as the 2014 Decision), which included a decision to implement a fundamental reallocation of the 3475–3650 MHz band to allow mobile services in addition to existing fixed services. The 2014 Decision also stated that flexible use in this band would be implemented after further consultation on a flexible use band plan and licensing framework. **The 2014 Decision determined that the future licensing framework should permit existing licensees that are in compliance with existing conditions of licence to continue to provide fixed wireless access services.** However, until recently, there was uncertainty regarding the future use of this band internationally.” (emphasis added)

¹⁰ *Statement by Industry Minister James Moore on the Consultation on Policy Changes in the 3500 MHz Band*, <https://www.canada.ca/en/news/archive/2014/10/statement-industry-minister-james-moore-consultation-policy-changes-3500-mhz-band.html>.

51. If ISED is to achieve its objective of maximizing the benefits of spectrum for all Canadians, then in establishing new policies for the 3500 MHz Band, it should first do no harm to the significant benefits derived from the fixed wireless Internet access valued by rural Canadians today.

A PATH FORWARD

52. Xplornet believes strongly that no Canadian should see a reduction or loss in their Internet service. ISED's current proposals would do precisely that. Without replacement spectrum, there should be no reclamation of licences held by operators who have met all conditions of licence and are using the spectrum for the betterment of Canadians. Historically, ISED has supported and enforced a policy of "use it or lose it". Yet, this Consultation proposes a "use it and lose it" policy for rural Canada.
53. Xplornet believes there is an alternative approach that would still make a critical mass of flexible use spectrum available to carriers who want to purchase it, while largely protecting the spectrum underlying the operations of companies like Xplornet that have deployed it and serve a significant customer base.
54. In its responses below, Xplornet will submit what it hopes will be considered a compromise for the 3450 MHz to 3800 MHz spectrum. First and foremost, this proposal maintains the ability to provide broadband service to rural Canadians. This alternative proposal would also accomplish the following objectives:
- foster innovation, investment and the evolution of wireless networks by enabling the development and adoption of 5G technologies by both existing licensees and others who may acquire the returned and new spectrum through the proposed auction;
 - support sustained competition for the benefit of consumers and businesses by reducing concentration of spectrum holdings in the band and allowing for a more balanced allocation of spectrum amongst existing licensees and other operators wishing to acquire spectrum to provide 5G services; and
 - facilitate the deployment and timely availability of services across the country, including in rural areas, by providing a clear path for existing licensees that will not slow down or delay their existing plans to roll out 5G services, including in the fixed configuration as early as next year.
55. Xplornet's proposal, which is described in detail in response to Question 6, would apply two pro-competitive measures: (1) a cap of 100 MHz per licensee per Tier 4 licence area (for so long as the band is 300 MHz or less in aggregate) and (2) a concentration cap that prohibits a licensee from holding more than a specified percentage of the band on a megahertz population (MHzPOP) basis.

56. Depending on the percentage of concentration cap applied and assuming the band is 200 MHz (from 3450 MHz to 3650 MHz), the existing larger licensees would each retain between 18% to 22% of the band, while small rural operators, with one exception, would retain all of their spectrum, representing approximately 4% of the band. The net result would be approximately 34% available to auctioned off to TELUS and other operators for deployment at a later date.
57. This proposal includes the 25 MHz of spectrum between 3450 MHz and 3475 MHz that ISED proposes to make available but does not take into consideration the 100 MHz that could be made available between 3700 MHz and 3800 MHz. If that 100 MHz is included, then in each Tier 4 area ISED has effectively left approximately 125 MHz of spectrum on average with the existing licensees, preserved the 50 MHz used as light licensed spectrum and made approximately 175 MHz of spectrum available to potential auction participants, all without materially impacting rural broadband services. This balanced approach does not unduly favour the existing licensees or potential new acquirers of spectrum but rather strikes a fair and equal balance between them.
58. This proposal uses the factors typically assessed by ISED for spectrum concentration, and is consistent with existing ISED policy.¹¹ It satisfies each of ISED's stated policy objectives in the Consultation and, crucially, insures rural Canadians would not see a reduction in service.
59. Xplornet expands upon this proposal and other issues core to this Consultation in its responses to the questions below.

¹¹ *Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licences for Commercial Mobile Spectrum*, <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10653.html>, paragraph 40.

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

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.

Xplornet agrees with ISED's assessment that fixed LTE, "5G ready" equipment has existed for a period of time in LTE Bands 42 and 43, and is currently under development for Band 48. Further, Xplornet agrees with ISED's assessment in paragraph 24 of the Consultation that equipment for 5G operations, requiring an LTE anchor network, will become available as early as 2019 for Bands 42 and 43, and the broad deployment of 5G operations, including of mobile products for consumer use, using Bands n78 and then Band n77, will not take place until 2020 and beyond.

However, what is being proposed is not consistent with LTE Bands 42 and 43 and does not contemplate a standalone 5G band plan for Canada. Absent a band plan, these proposals do not address a long term spectrum outlook. Rather, they represent an anomalous organization of the Band without coherent standards for operators that conform to international trends, such as what is occurring in the United States with the proposed expansion of the 3700-4200 MHz band to free up more spectrum for 5G applications.¹²

Xplornet is currently conducting 5G equipment trials following the global 3GPP standards established for 5G for fixed service within Bands 42 and 43 and using its LTE anchor network. It is expect commercial deployment will be possible in 2019. Xplornet notes this is in advance of the equipment timeline currently in place for mobile 5G equipment, which is anticipated to be in 2020 or later.

Q2 — ISED is seeking comments on the proposals for:

- **adding a primary mobile allocation to 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**

In light of the current limited use for aeronautical and marine radar, Xplornet is supportive of adding a primary mobile allocation to the 3450-3475 MHz band to make it co-primary fixed and mobile allocation, which renders it the same flexible use as the adjoining spectrum in the 3475 MHz to 3700 MHz frequencies. ISED has already put into place a policy framework following its 2014 Decision regarding the 3500 MHz Band that would

¹² *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, <https://docs.fcc.gov/public/attachments/DOC-351868A1.pdf>.

apply flexible use to the 175 MHz of spectrum within the 3475-3650 MHz band. Xplornet agrees with ISED's assessment that this policy could be expanded, allowing for 200 MHz of flexible use spectrum within the 3450-3650 MHz band.¹³

Xplornet therefore also supports removing the radiolocation allocation and making corresponding changes to the *Canadian Table of Frequency Allocations*, as explained on page 8 of the Consultation.

Xplornet believes strongly that before any of this spectrum is allocated, consultation with operators on a band plan is essential to ensure clarity for all operators.

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

Xplornet is in favour of allowing flexible use in the 3450-3475 MHz band. As stated in response to Question 2, ISED has already enabled flexible use for 175 MHz of spectrum in the Band. This proposal would extend that to 200 MHz and is in keeping with existing policy.

The 5G equipment is expected to require ideally 100 MHz or at a minimum 50 MHz of contiguous spectrum for optimal efficient use. The 25 MHz from 3450-3475 MHz should be designated for the same flexible use as the adjacent 25 MHz from 3475-3500 MHz to allow for future 5G operations. For this reason, ISED should attempt to allow the same flexible use for as much of the 3400 MHz to 3800 MHz spectrum as possible to align with the international standards and the equipment that will be available.

As noted in the response to Question 2, a band plan is required that addresses the long term use of the 3500 MHz Band. The formation of a band plan would avoid an anomalous organization of the Band and allow for the development of coherent standards for operators that conform to international trends.

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.

Xplornet supports making spectrum in the 3400-3450 MHz band available for flexible use as soon as possible. ISED has indicated in the Consultation that this 50 MHz of spectrum is currently in limited use for aeronautical and marine radar. If there is a concern that inference may occur, this spectrum could be designed for fixed use initially, which would allow for better co-ordination amongst all parties to balance any existing deployments within the 3400-3450 MHz band. Specifically, an initial deployment of fixed service would better allow for the implementation of interference mitigation measures, such as frequency co-ordination, radio power restrictions and the use of shielding, where appropriate.

¹³ *The Consultation*, SLPB-004-2018, p.8.

Given the potential need for co-ordination, ISED might consider making the 3400 – 3450 MHz spectrum available for smaller fixed broadband operators who have more regionalized footprints that could be co-ordinated around existing radiolocation deployments, thereby allowing for more effective co-existence than might occur with mobile devices that could stray into range of the radiolocation deployments.

Similarly, ISED may consider relocating the existing light licensed operators in the 3650 MHz Band to this 50 MHz between 3400 MHz and 3450 MHz. Typically, consumer premise equipment and radio access equipment serving the 3650 MHz Band will operate in the 3475 MHz to 3675 MHz frequency range. Such a relocation may offer better protection for light licence users from the potential interference of mobile users and would allow Band 43 to be cleared for a more efficient allocation in the auction process with adjacent spectrum that may be available in the 3700 MHz to 3800MHz frequency range. However, Xplornet would only support this relocation if it could be done with minimal impact on the operations of existing rural ISPs using the current 3650 MHz Band.

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.

The two options outlined by ISED in the Consultation would do significant, long-term damage to rural connectivity by taking away from rural ISPs spectrum that is necessary to provide service to customers and ensure rural Canadians can benefit from 5G services in the same timeline as urban Canadians.

Xplornet is the largest active user of 3500 MHz spectrum and has been for a decade. In fact, Xplornet was the first in North America to test LTE in the 3500 MHz Band, opening the door to 5G services Canadians will soon enjoy. Xplornet has invested nearly half a billion dollars putting this spectrum to use for rural Canadians.

Xplornet is deploying 5G-ready equipment this year in its wireless network and intends to invest any capacity gains from this equipment over the current LTE equipment into managing the tripling of demand expected to be placed on the network by growing customer data use in the next three years. However, with block sizes of 10 MHz, no efficiencies are anticipated.

Absent any replacement spectrum to manage these demand increases, taking back 3500 MHz spectrum would have major, long-term consequences: rural Canadian homes and businesses would see their service capped, reduced, or worse, disconnected.

Xplornet's current LTE network carries more data per day than either of the mobile networks of Bell or TELUS. All parties to this consultation would agree that consumers, both rural and urban, want more from their Internet service: more speeds, and more bandwidth to consume video and take advantage of the Internet of Things and other capabilities made possible by 5G technology.

In addition, the Government of Canada has made significant investments to support connectivity and innovation in rural Canada. However, the greatest barrier to improving rural connectivity is not access to public funding or private capital. It is access to spectrum, which ISED is proposing Xplornet and other rural Internet service providers return without any plan for the rural Canadians this would impact.

Below are more detailed comments on the impact of the two proposed options.

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 1 of losing two-thirds of its current 3500 MHz spectrum holdings would be catastrophic for Xplornet. We could not possibly continue to supply the level of service provided today with this amount of spectrum and there is no way that Xplornet could respond to future growth as customers continue to use more and more bandwidth.

The result of this proposal would see Xplornet lose 66% of its 3500 MHz spectrum licences.

It is estimated that approximately 200,000 rural households would lose or experience reduced Internet service under this option, and the economics of Xplornet's existing network would have to be reassessed. Future expansion would also be more difficult to justify on an economic basis.

Frequency reuse and cell splitting, if even feasible in certain areas to attempt to compensate for the lost spectrum, would inherently drive up costs and make the cost of rural broadband significantly less affordable than it is today for customers.

The Minister has suggested that "Canadians are concerned about the rising cost of their Internet bills. They deserve more affordable options. They deserve more choice."¹⁴ The two options proposed would do exactly the opposite: take away service and reduce competition in rural areas, and inevitably drive Internet prices up for rural Canadians.

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.

¹⁴ Innovation Minister Navdeep Bains takes aim at wireless affordability, *The Globe and Mail*, <https://www.theglobeandmail.com/report-on-business/industry-news/innovation-minister-bains-takes-aim-at-wireless-affordability/article35209177/>.

Option 2 of keeping up to 50 MHz of spectrum, while obviously less damaging than Option 1, would still penalize Xplornet for making good use of its 3500 MHz spectrum, particularly in areas where fixed service is most needed and most in demand. This option would force Xplornet to return spectrum in 94 Tier 4 areas resulting in a loss of capacity to serve current customers and eliminate the ability to meet the future needs of new and existing customers who want more speed and more data.

This option would see Xplornet lose over 25% of its existing spectrum on a national basis, with Alberta and Ontario being especially hard hit. These two provinces are the largest fixed wireless broadband service areas in Canada and the loss of spectrum in these areas will be immediately impactful to customers.

To quantify the impact, Xplornet has conducted an analysis of its 3500 MHz spectrum holdings by each Tier 4 licence area and its customers per licence area. While Xplornet is unable to disclose this commercially sensitive information publicly in this Consultation, as an order of magnitude, Option 2 would directly impact the broadband service of over 40% of all fixed wireless customers immediately and would limit capacity for future growth of services to over 75% of Xplornet's customers.

Option 2, like Option 1, would have an immediate detrimental effect on the broadband services of rural Canadians in all provinces and eliminate the last 4 years of progress improving rural connectivity.

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.

Xplornet would like to put forward an alternative proposal to address the availability and concentration of the 3500 MHz spectrum and implications for competition. In the *Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licences for Commercial Mobile Spectrum*, DGSO-003-13, June 2013 (the "Spectrum Transfer Framework"), ISED makes reference to how concentration of spectrum can have a detrimental impact on competition¹⁵ and should be assessed:

"Spectrum concentration should be considered on a number of different levels. Overall spectrum concentration across commercial mobile spectrum bands is key to assessing the availability of spectrum for competitors. In-band concentration should also be considered, as each band can possess unique characteristics that are not or cannot be replicated in other bands. Thus, spectrum concentration within the band may influence competitors' ability to offer comparable services."¹⁶

¹⁵ Spectrum Transfer Framework, paragraph 9,

¹⁶ Ibid, paragraph 33.

In paragraph 40 of the Spectrum Transfer Framework, ISED indicates that the first two factors it will take into account in assessing any transfer of spectrum are:

“(a) the current licence holdings of the Applicants and their Affiliates in the licensed area; [and]

(b) the overall distribution of licence holdings in the licensed spectrum band and commercial mobile spectrum bands in the licensed area;”¹⁷

In particular, ISED has previously interpreted paragraph 40(b) to including looking at not only the concentration in a given licence area (in this case, a Tier 4 area) but also the overall percentage of the band, across all Tier 4 licence areas, held by a licensee, on a megahertz times population (MHzPOP) basis.

Xplornet proposes a two-step process for applying pro-competitive measures to the existing 3500 MHz spectrum licensing arrangements:

1. **100 MHz cap per Tier 4 licence area:** To allow for at least two or more competitors in each Tier 4 area, the first measure is to apply a cap that prohibits any licensee from holding more than 100 MHz within each Tier 4 licence area and requiring the return to ISED of any spectrum in excess of the 100 MHz cap.
 - This is the same concept as the 50 MHz cap proposed in Option 2 by ISED but is less impactful on rural broadband deployments in Alberta, Saskatchewan and Ontario.
 - On average, approximately 50 MHz is returned in 71 Tier 4 areas, with 50 MHz to 75 MHz being returned in 12 of the 24 Large Urban areas (Tier 4 licence areas with a population center of more than 100,000 people), including 75 MHz in each of Toronto, Montreal and Vancouver, which are likely the areas of most interest for mobile 5G competition and early mobile deployment.
2. **Concentration Cap of 40% Across the Band:** After applying the 100 MHz cap, provide that any licensee (including all associated and related entities) cannot hold more than 40% of the MHzPOP in the existing 175 MHz of spectrum within the 3500 MHz Band. To be in compliance, a licensee would be required to divest 25 MHz per Tier 4 area to insure there is spectrum made available across a wide geographic area.
 - Given ISED has indicated that Large Urban areas, followed by Mid-Sized (Tier 4 areas with a population center of 30,000 or more) areas, are the first areas where deployment of 5G is likely to occur, an additional condition could be incorporated that provides for the return of

¹⁷ Ibid, paragraph 40.

25 MHz to be prioritized in Large Urban Tier 4 areas, followed by Mid-Sized and then Rural Tier 4 areas until the licensee is below the 40% concentration level.

- Depending on how the rules are applied, this could result in spectrum being returned for auction in all but 4 of the 58 Large Urban and Mid-Sized Tier 4 areas or could result in the return of spectrum in all but 6 of the 172 Tier 4 areas.¹⁸
- In terms of concentration, it would leave the largest existing holder (and its affiliates Bell and Rogers) with just under 40% of the existing 175 MHz of spectrum, Xplornet at approximately 17%, the other licensees with approximately 4.5% and ISED would have approximately 40% of the band to auction to new licensees, such as TELUS and Shaw.
- **It is anticipated that no individual licensee, after the auction, would have more than 20% of the band, which represents a healthy distribution that promotes competition.**¹⁹

Although Xplornet and Signal Direct Communications would experience some reduction in areas where they have more than 100 MHz, this proposal otherwise leaves all other existing rural broadband providers with the spectrum they have deployed to serve Canadians. **In short, there would likely be minimal impact on rural broadband services.**

This alternative proposal addresses all of the policies objectives set out in section 3 of the Consultation:

- *Foster innovation, investment and the evolution of wireless networks by enabling the development and adoption of 5G technologies;*

This alternative proposal creates certainty for all existing licensees and allows them to continue to pursue their 5G strategies in a timely manner, including those seeking to develop 5G fixed uses for rural broadband next year. It also results in the return of approximately 40% of the existing 3500 MHz Band to be auctioned for use by potential new licensees who wish to invest and develop 5G technologies in competition with the existing licensees.

- *Support sustained competition, so that consumers and businesses benefit from greater choice; and*

¹⁸ Those six Tier 4 areas where spectrum is not returned are areas with significant fixed wireless customers, such as Kingston and Peterborough, Ontario, or areas where there are multiple licensees, including TELUS, such as Edmonton, Alberta.

¹⁹ This assumes that Inukshuk will ultimately distribute 50% of its spectrum to each of Bell and Rogers.

This alternative proposal results in a balance of spectrum holdings that will permit sustained competition. In urban areas, this leaves room for at least four competitors with approximately equal spectrum holdings. In rural areas, the existing competitors can continue to compete and grow their businesses, and the auction will allow potential new entrants or existing operators using light licensed spectrum to obtain licensed spectrum to provide rural broadband services. The proposal maintains the viability of current competition and allows for new entrants to increase competition.

- *Facilitate the deployment and timely availability of services across the country, including rural areas.*

Adopting this alternative proposal has the added advantage of minimal disruption to existing operations until more 3500 MHz spectrum is made available. As a result, the time for transition could be very quick once the band plan is announced. Xplornet anticipates that the transition in all areas, Large Urban, Mid-size and Rural could be done within 6 months of the announcement of the band plan. This accelerates the time to deployment and availability of services across the country, including in rural areas.

ISED may note that in the recent policy direction to the Australian Communications Media Authority (ACMA) released on July 11, 2018, the Government of Australia imposed a larger cap of 80 MHz in rural licence areas, versus 60 MHz in urban, in order to auction spectrum in its 3500 MHz band in 2018. This is a recognition of the bigger roll spectrum plays in rural areas to provide broadband services. Australia, may arguably be able to adopt the 80 MHz cap because it has committed significant public investment through Telstra and subsequently the National Broadband Network (NBN) in order to build out networks in its rural areas, thereby reducing the dependence of private providers for all rural capacity. Canada has relied on private investment and does not have the rural broadband capacity of the NBN available. As a result, Canada needs to keep more spectrum for broadband in the hands of the rural providers to insure adequate capacity.

In summary, this proposal frees up a reasonable and proportional amount of spectrum for auction to promote competition, is minimally disruptive to existing rural broadband operations, creates certainty for existing spectrum holders who want to invest in new 5G technology and could be implemented with a very short transition window to allow for the faster implementation of 5G technologies.

In the next question (Question 7), ISED is seeking comment on the use of 10 MHz blocks. The alternative proposal just described still leaves the spectrum holdings in blocks of 25

MHz. As a result, Xplornet has one more suggestion to align the resulting spectrum holdings with 10 MHz spectrum blocks:

- **Round Up to Closest 10 MHz** – Treat spectrum holdings as being in the aggregate (i.e. two 25 MHz blocks are considered 50 MHz or 5 blocks of 10 MHz) and **round up any 25 MHz or 75 MHz holdings by 5 MHz** (i.e. 25 MHz would become 30 MHz).

In ISED's Option 1 and Option 2, the net result is rounding down by 5 MHz for blocks of 25 MHz. As set out in this submission, ISED is assuming efficiencies that are not going to exist in smaller blocks, like 10 MHz. Rounding down will adversely impact service in smaller networks.

Further, ISED has not made any spectrum available for fixed wireless rural broadband since 2006. Demand for broadband capacity to serve existing customers continues to grow at 20% or more per year. Instead of punishing those operators who invested and developed networks using 3500 MHz Fixed Wireless Access spectrum for the past 10 years, ISED should acknowledge their commitment to fulfilling the very important public policy objective of delivering rural broadband to Canadians and allow these holdings to be rounded up 5 MHz.

While an initial reaction might be to think this undermines the repatriation of spectrum that has just occurred, it does not make a significant difference to the amount of spectrum available for auction, and yet it could make a meaningful difference to rural broadband operators and consumers.

In doing this assessment, Xplornet looked at a band of 200 MHz (which is divisible into 20 blocks of 10 MHz).²⁰ If a rule to round up by 5 MHz is applied to any spectrum holdings that are not in 10 MHz increments under Xplornet's alternative proposal, Inukshuk and its associated entities hold approximately 36% of the spectrum, Xplornet holds approximately 18%, the other existing licensees hold approximately 4% and approximately 42% of the spectrum is available to be auctioned by ISED.

It is important to note that this is only the spectrum between 3450 MHz and 3650 MHz. It does not include the 50 MHz between 3650 MHz and 3700 MHz. If that is included, then the breakdown is as follows (approximately):

Inukshuk (and affiliated/associated entities)	29%
Xplornet	14%
Others licensees	3%
Other light licensees	20%
Available for auction	34%

²⁰ Using the existing 175 MHz did not make sense because it is not evenly divisible into 10 MHz blocks.

This is before the 100 MHz between 3700 MHz and 3800 MHz is added for potential auction, which once allocated would result in 53% or approximately 190 MHz per Tier 4 area being available for auction.

In summary, Xplornet's proposal would result in ***approximately one-third of the spectrum in the 3500 MHz Band becoming immediately available for auction to potential new licensees who wish to deploy 5G technologies***, approximately half would remain with existing licensees and 20% would remain available to light licensees. Most importantly, this alternative proposal would protect rural broadband, maintain the services available today and allow ISPs to plan for the 5G services of tomorrow to better serve rural Canadians.

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

Xplornet is supportive of unpaired blocks consistent with a TDD configuration. However, before any discussion occurs regarding the size of unpaired blocks in the 3450-3650 MHz frequency range, Xplornet strongly reiterates the need for a coherent band plan that would properly organize the Band and give operators the necessary clarity prior to 5G applications being deployed.

For example, Bands 42 and 43 are well-established as global LTE standards. Unfortunately, operators in Canada are impaired from taking full advantage of this spectrum because of how Canada's existing Band Plan that is currently segmented.

If Canada is to adopt a band plan to align with Bands 42 (3400-3600 MHz) and 43 (3600-3800 MHz) internationally or the new Band n78 (3300-3800 MHz), ISED will need to address the use of the 50 MHz between 3400 MHz and 3450 MHz, the placement of the light licensed spectrum in the middle of Band 43 (3650-3700 MHz) and the displacement of C-band from 3700-3800 MHz.

Until the size of the band or bands has been determined and the arrangement of the different uses within the band, it is difficult to comment on the proposed idea of 10 MHz blocks. From its conversations with equipment manufacturers and its work with international standards organizations, Xplornet believes that, at a minimum, 50 MHz blocks are necessary, while 100 MHz blocks are preferable to realize the full potential efficiencies available from 5G technology. The proposed 10 MHz blocks are too small to achieve workable efficiencies of any kind.

However, for the purpose of this Consultation, if the reason for suggesting 10 MHz blocks is to allow for future alignment with Band n77 using 100 MHz or 50 MHz blocks that are more likely to become the standard for 5G deployments, Xplornet is supportive of using 10 MHz blocks as a placeholder, subject to the proposed rounding up to 30 MHz for any 25 MHz blocks today. The 10 MHz blocks should not be considered a long term solution. Once a band plan is established for the 3500 MHz Band, Xplornet believes it would be more appropriate to have 50 MHz or 100 MHz blocks.

Xplornet encourages ISED to undertake a band plan for the spectrum in the frequency range of 3400 MHz to 3800 MHz and then, only after the band plan is determined should ISED consider an approach to the size of unpaired blocks in this frequency range.

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

Xplornet believes that existing coordination methods in the band should continue. Xplornet has considerable experience with these issues and has found the process to be manageable. In Xplornet's 10 years of deployment experience, the only significant incidents of interference that have impacted effective use of the 3500 MHz spectrum occurred because of either careless frequency deployment that resulted in the use of the wrong frequency block or the deployment of radios without the necessary filters to remove out of band (or out of block) signals.

In Xplornet's experience, given the propagation characteristics of the spectrum and the power levels of the radios used, TDD synchronization and professional co-ordination between operators can address interference issues effectively. To date, licensees have otherwise been able to co-exist and operate in relatively close proximity while avoiding interference.

Using *Technical Requirements for Fixed Wireless Access Systems Operating in the Band 3475-3650 MHz*, SRSP 303.4, as a precedent, Xplornet encourages ISED to initiate a consultation to modify SRSP 303.4 to allow for mixed use licences in a modified band plan.

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.

ISED has outlined an immediate need for more flexible use 3500 MHz spectrum in large urban areas. However, ISED has also suggested that issuing flexible use licences to existing licensees before the auction would give the existing licensees a significant competitive advantage.

If the intent of this Consultation is to take back and auction the 3500 MHz spectrum so that Canada does not lose time in its 5G deployments, it is counterproductive to impose artificial handcuffs on parties to stop their drive to innovate and deploy for the benefit of Canadians so that one party can say it was not at some sort of disadvantage.

Xplornet does not believe ISED should be in a position of attempting to regulate or control competition in this manner. ISED has an obligation to insure that the allocation of spectrum is done in a manner that fosters competition and does not allow any party to engage in anti-competitive behaviour.

Xplornet would suggest existing licensees should receive flexible use licences once the band plan is established and it is known where existing licences will be reassigned within the band. Delaying this process until after the auction of new spectrum for urban centres would suspend the introduction of 5G services in rural areas by a year or more. This is not really a head-start issue. Xplornet is already in these rural areas serving a rural population base. No public policy objective is served by slowing down Xplornet and other rural broadband providers from serving customers with flexible use spectrum.

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.

Xplornet believes that price discovery, used by applying a combinatorial clock, is the best option in a licensing process since it reduces the bidder's uncertainty about the base price it will have to pay for a given package of spectrum blocks.

However, Xplornet submits that it is premature to discuss auction formats in advance of determining what spectrum is to be auctioned, what pro-competitive measures, if any, are to be imposed, and what band plan is to apply.

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*

Given that Xplornet fundamentally opposes Options 1 and 2 proposed by ISED for the claw-back of existing spectrum holdings, we are opposed to these notice and protection periods as well.

If ISED decides to modify its proposals to require the return of spectrum from existing licensees in the manner proposed by Xplornet in response to Question 6, then these

protection periods and notice periods will no longer be required and a much shorter timeframe can be accommodated for everyone.

As a general principle, the less impactful the outcome for rural operators, the shorter the time for the notification and protection periods would be.

However, if ISED proceeds with Options 1 or 2, the notification periods will become crucial. It will be required to enable Xplornet to redeploy its network in a manner that results in the least possible loss or diminution of service to its rural customers. At a minimum, Xplornet would suggest a 1 year protection period to allow for the necessary network changes and customer transitions, including replacement of customer premise equipment or repointing of customers. As a result, Xplornet would, if forced to choose between these incredibly damaging alternatives, opt for at least a 1 year notification in all areas, and a minimum protection period of 1 year for Large Urban areas, and 3 years for all other areas.

Xplornet does not support the concept of a 10 km buffer. As ISED is aware, going just 5 km outside of an urban area is often “farm country” with low density rural populations.

If there is to be a buffer, Xplornet would propose implementing one *inside* of city limits. For example, the densities in the Toronto suburbs of Scarborough and Etobicoke do not justify the mass of spectrum held by the mobile carriers today. There is no need to take away what little spectrum there is in the green belt around Toronto, for example, as yet another buffer zone.

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.

Xplornet is prepared to work closely with ISED on an expedited transition plan provided crucial spectrum it not being taken away as has currently been proposed. Under an alternative proposal, such as the one Xplornet has proposed in response to Question 6, Xplornet believes all licensees can work closely with ISED to make spectrum available for auction as soon as possible. Given most radios deployed in the 3500 MHz Band and potentially most radios deployed in the 3650 Band have the flexibility to move from 3475 MHz to 3650 MHz, it should be possible to transition within 6 months of a band plan being established. To the extent there is a transition to 3400 MHz to 3475 MHz is to occur, the technical specifications of the radio access equipment and the ability to access this spectrum will need to be considered. Consumer premise equipment currently in use should not be problematic since most commercial equipment covers Bands 42 and 43 (3400 MHz to 3800 MHz).

If Option 1 or 2 is implemented, Xplornet proposes in its response to Question 11 a longer implementation timeframe because of the impact on customers.

As noted, this cannot proceed absent a plan for the 3500 MHz Band as a whole, which would have to be developed in advance of any process.

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.

The introduction of the equipment supporting 5G technologies will not be more susceptible to interference than what currently exists within the Band.

On occasion Xplornet has observed interference in its network from sources in the United States. This interference was able to be mitigated through co-ordinated alignment of all cell sectors, power management, and TDD synchronization techniques in a manner similar to that referenced in our response to Question 8. However, in the absence of a formal process of engagement with international operators, these efforts were *ad hoc*, and were neither as effective nor as timely as what we experience with domestic operators. Xplornet encourages ISED to engage the FCC to formally establish a trans-border interference mitigation strategy following modification of *Technical Requirements for Fixed Wireless Access Systems Operating in the Band 3475-3650 MHz*, SRSP 303.4 to allow for mixed use licences in a modified Band Plan.

One issue for future consideration is the potential for interference caused by the adoption of different frame ratios (forward to return) by different operators. This can be addressed as part of the 3500 MHz Band plan consultation or in any modifications to the technical requirements for operating in the band.

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.

Xplornet appreciates that this spectrum is used by many smaller, rural ISPs to provide service to Canadians. It is important that service be maintained and, absent any alternative spectrum, this band must remain available to these ISPs.

Regrettably, this 50 MHz band is in the middle of Band 43. Ideally, it would be more efficient if this 50 MHz could be moved to 3400-3450 MHz, thereby placing it at the end of a band to allow for more efficient allocation of contiguous blocks of spectrum within Band 42 and Band 43. As noted in our response to Question 4, the fixed and regional nature of these deployments make them better suited than mobile deployments for addressing and co-ordinating to avoid interference.

However, Xplornet appreciates that the radios being used by some operators in the 3650 MHz Band may not have the frequency range necessary to easily move to the 3400 MHz to 3450 MHz frequency band. Since maintaining connectivity of rural Canadians is of paramount importance, Xplornet would only suggest moving this block if it is possible to do so with minimal disruption to the smaller operators making use of this band.

If it is not possible to relocate this 50 MHz, Xplornet remains supportive of maintaining 50 MHz of light licensed spectrum in the 3650 MHz Band for the benefit of ISPs providing broadband services to Canadians.

Xplornet does not recommend that ISED introduce a database access model, similar to what has been contemplated in the United States with the Citizen Broadband Radio Service (CBRS) band. This includes an extremely complex Licensed Shared Access (LSA) approach, in which a database manages spectrum on behalf of client licence holder to manage the CBRS band. Further, the uncertainty of the quantum of spectrum available makes planning infrastructure investments and network capacity nearly impossible.

It has been noted by Rogers in a recent consultation that the LSA approach in the U.S. makes it unlikely that operators will be able to provide the wide contiguous channels in the CBRS band that makes the 3500 MHz Band so well suited to 5G in Canada.²¹ This process is not supported by most Canadian operators and would be a bad idea for Canada to follow.

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

Satellite demand for C-band is in decline and it would make sense to consolidate this usage in part of the band to make more room for flexible use wireless broadband services that are experiencing increased demand. This is an important source of spectrum that could help to relieve the pressure on existing wireless spectrum used for broadband access, which is of particular concern to Xplornet and its rural customers.

Freeing up C-Band spectrum for flexible use to deploy 5G wireless technologies would eliminate the need for ISED to take away spectrum in the 3500 MHz Band from existing operators who are putting it to good use. It would preserve the positive steps taken to date by both rural operators and the Government of Canada to extend high-speed broadband access services to rural Canadians, while freeing up additional spectrum for 5G purposes.

As ISED contemplates these changes, the FCC this month issued a draft Notice of Proposed Rulemaking (NPRM) seeking public comment on new ways to use the 3.7-4.2 GHz band for terrestrial wireless services. The FCC's draft Notice received praise from industry, including satellite players backing an industry-based solution to make spectrum available for 5G.²²

Given the number of C-Band licensees is minimal and given the demand for spectrum, it provides evidence that a new broadband terrestrial system could indeed co-exist with existing satellite telecommunications. By utilizing this spectrum, Xplornet believes there is an opportunity to unlock spectrum for rural areas. Xplornet believes this process should be done in concert with any consideration of 3500 MHz Band.

Xplornet acknowledges the importance of Fixed Satellite Service (FSS) backhaul for rural and remote communities. This is particularly important in rural areas that lack the

²¹ Rogers Communications Inc., *Comments in Response to the Consultation on the Spectrum Outlook 2018-2022*, paragraph 29.

²² Ibid.

population density to permit the economical deployment of wired backhaul facilities. If the promise of the new broadband standard set by the CRTC is going to be realized, this issue of dependence on C-Band backhaul will need to be addressed.

However, Xplornet does not agree that all 3700 to 4200 MHz spectrum on a Tier 1 basis is required to support future FSS operations. FSS utilization is in clear decline, and while some exclusion zones may need to be identified for a fixed period of time, particularly north of the 60th parallel, and certain interference mitigation tactics may need to be employed in proximity to satellite gateways, the 3700-3800 MHz portion of the band can be made available for terrestrial use today.

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.

Xplornet strongly supports this proposal which would certainly facilitate enhanced coordination of spectrum use. All unlicensed operators should be required to submit their specifications as a prerequisite to being granted protection from interference. Further, such information would permit terrestrial operators in the 3800 MHz Band to identify areas where potential shielding or other inference mitigation tactics are required. Most importantly, it would allow ISED to make informed decisions about any potential reallocation that may be needed to insure the scarce resource of spectrum is being efficiently used to best serve Canadians.

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).

Xplornet is supportive of ISED optimizing use of the 3700-4200 MHz band. In the short term, ISED should make available 100 MHz of this spectrum in the 3700-3800 MHz frequency band for flexible use to deploy 5G technologies.

C-Band (3700 MHz to 4200 MHz) spectrum usage has changed extensively over the years in Canada. Thirty years ago, C-Band spectrum was heavily utilized for direct-to-home television services provided to urban and rural homes using big satellite dishes installed for receiving TV signals. Today, the existing users of the 3700 MHz to 4200 MHz frequency spectrum are point-to-point terrestrial microwave users, satellite VSAT systems, television broadcast undertakings receiving their network feeds via satellite for rebroadcast (CBC, CTV, others) and Cable TV head-ends receiving some of their satellite signals from C-Band services.

Therefore, given the small amount of C-Band licences maintained in the ISED database, this spectrum is not being utilized in a meaningful and efficient way. There is an opportunity to deploy this spectrum for more beneficial uses. Instances of demonstrable interference would be miniscule and could be manageable using the existing regulatory rules in place.

Based on engineering reports, Xplornet believes terrestrial wireless deployments in the 3800 MHz Band can co-exist with C-Band use, provided care is taken in proximity to the satellite gateways. Knowledge of the location of the gateways using C-Band, through required registration in a database, would help terrestrial operators design around the gateway locations. In proximity to the gateways, formal frequency co-ordination procedures would be followed and some combination of interference mitigation techniques such as (i) rotating frequencies and site channelization plans, (ii) changing coverage patterns or broadcast locations, (iii) facilities shielding and (iv) installing microwave interference filters to provide additional attenuation that will protect receive station LNB/Receiver from front-end overload, would allow for terrestrial deployment within proximity of a satellite gateway station.

Finally, Xplornet understands that only 20 MHz of the 3700 MHz to 3800 MHz spectrum may be in use for specific channels. If so, ISED may wish to explore the possibility of using other spectrum in the C-Band to relocate the channels using the 20 MHz. This may be made easier by the work being done by the Federal Communications Commission (FCC) in the United States.

The FCC has recently proposed to do exactly this by optimizing the C-Band in the United States by *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, through a draft Notice of Proposed Rulemaking (NPRM) issued on June 21, 2018.²³

In the NPRM, the United States has proposed to add a mobile allocation to the C-Band, and has sought proposals “expanding flexible use in the band, including whether to transition all or part of the band through a market based mechanism.”²⁴

Xplornet notes this proposal has earned praise from the telecommunications industry in the U.S., including from satellite operators as an “industry-based solution to make more spectrum available for 5G.”²⁵

Xplornet is supportive of Canada taking similar steps to make more spectrum available through utilization of this Band. Optimizing the 3700 MHz - 3800 MHz band would immediately make 100 MHz of prime spectrum available for 5G services. This represents just 20% of the total 500 MHz of spectrum that could potentially be available over time, subject to an additional public consultation.

Existing LTE radios in Band 43 can already access this spectrum and it is anticipated the first 5G Band n78 radios will operate at frequencies within 3600 MHz - 3800 MHz. It is therefore logical for Canada to align with equipment manufacturers and include this spectrum which is accessible by these radios.

²³ Federal Communications Commission, Proposed Notice of Rulemaking (NPRM), *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, <https://docs.fcc.gov/public/attachments/DOC-351868A1.pdf>.

²⁴ *Ibid.*, p.1.

²⁵ *C-Band draft NPRM wins praise from WISPA, OTI*, <https://www.fiercewireless.com/wireless/c-band-draft-nprm-wins-praise-from-wispa-oti>.

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.

As stated above, the existing users of 3700-4200 MHz frequency spectrum are point-to-point terrestrial microwave users, satellite VSAT systems, television broadcast undertakings receiving their network feeds via satellite for rebroadcast (CBC, CTV, others) and Cable TV head-ends receiving some of their satellite signals from C-Band services.

Any new licensed point-to-multipoint distribution system in an area would have to be cognizant of the potential for interference to and from other C-Band users and provide complete co-ordination and co-operation to plan around harmful interference in order to jointly utilize the spectrum on a non-interference basis.

Xplornet believes the total number of the number of C-Band satellite receiver locations is minimal and given the demand for spectrum, it is demonstrable that a new broadband terrestrial system could indeed co-exist with existing satellite telecommunications.

C-Band microwave is still used in only the most remote locations and isolated areas with no fiber optic facilities or where they still need a backup communications path. For the most part, the 6 GHz microwave band is the one that is still in use, not the 3700 MHz to 4200 MHz band.

Given the small amount of C-Band licences maintained in the ISED's database, there is an opportunity to deploy this spectrum for more beneficial uses. Instances of demonstrable interference would be miniscule and could be manageable using the existing regulatory rules in place. The number of situations in which a satellite system looks directly into a near terrestrial system and would experience harmful interference is minimal and avoidable. Existing ISED interference mitigation strategies could manage or eliminate the incidence of interference permitting the band to be shared with existing users and the addition of wireless broadband users.

For the above reasons, using a portion of this spectrum to provide broadband to rural and remote Canadians would be of immediate benefit for both urban and rural Canada and should play a critical part of ISED's approach to making spectrum available for 5G services.

Xplornet thanks Innovation, Science and Economic Development Canada for the opportunity to provide comments on this very important Consultation for rural Canadians.