

15 September 2017

Innovation, Science and Economic Development Canada (ISED)
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Re: Gazette Notice SLPB-001-17 – Consultation on Releasing Millimetre Wave Spectrum to Support 5G – Cogeco Comments

In accordance with the procedures set out in the above-noted consultation, please find attached the comments of Cogeco Communications Inc. ("Cogeco").

Cogeco thanks ISED for the opportunity to submit comments in this proceeding and remain available to answer any questions you may have regarding this submission.

Yours very truly,

Michel Messier
Senior Director, Regulatory Affairs, Telecommunications

c.c.: Nathalie Dorval, VP Regulatory Affairs and Copyright, Cogeco Inc.
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**Innovation, Science and Economic Development Canada
Spectrum Management and telecommunication
Consultation on
Releasing Millimetre Wave Spectrum
to Support 5G**

***Canada Gazette, Part I, June 17, 2017,
Notice No. SLPB-001-17***

**Comments of
Cogeco Communications Inc.**

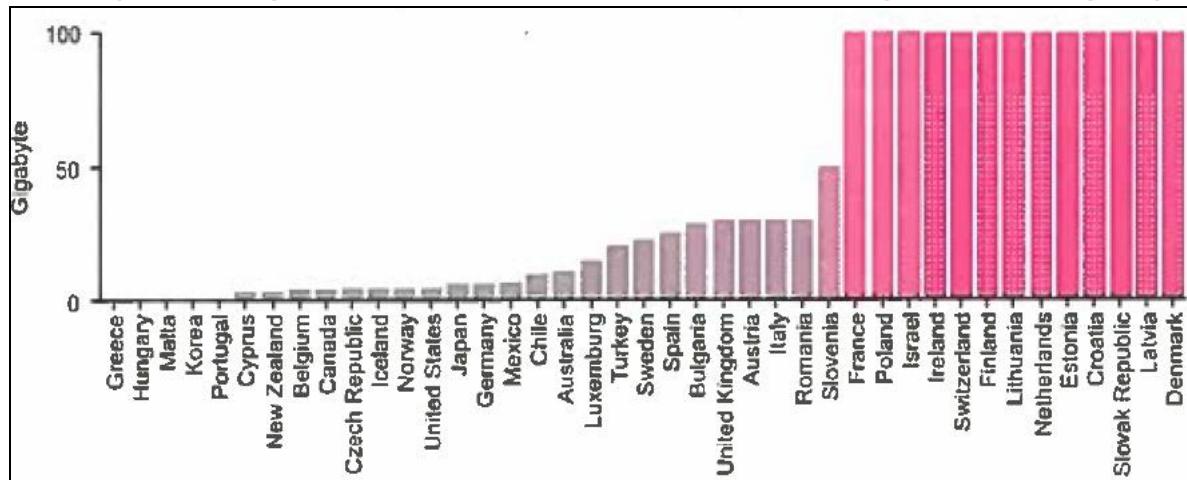
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Introduction

1. Cogeco Communications Inc. (“Cogeco”) is pleased to submit these comments on the proposal to release millimeter wave (“mmWave”) spectrum in the 28 GHz, 37-40 GHz and 64-71 GHz frequency bands to support the deployment of 5G wireless networks and services, in accordance with the procedures set out by Innovation, Science and Economic Development Canada (ISED) in *Consultation on Releasing Millimetre Wave Spectrum to Support 5G, Canada Gazette, Part I, SLPB-001-17*, dated 5 June 2017 and in *Extension to the comment period: Consultation on Releasing Millimetre Wave Spectrum to Support 5G, Canada Gazette, Part 1, SLPB-004-17*, dated 6 July 2017 (together, the “Consultation Document”).
2. Cogeco is a diversified communications company headquartered in Montreal, Quebec, that provides video, Internet and telephony services through its affiliate Cogeco Connexion Inc. to residential and business customers as well as offering third party Internet access and transport services to Internet service providers on a wholesale basis in Ontario and Quebec.
3. Cogeco also provides an entire suite of information technology services to its business customers through Cogeco Peer 1 (Canada) Inc. Included among the services provided by this entity are collocation, network connectivity, hosting and cloud services, all of which are supported by 17 data centres, an extensive fibre network in Montreal and Toronto, as well as points-of-presence in North America and Europe.
4. As a competitive communications service provider that has invested heavily in infrastructure in Canada over many years, Cogeco has always supported the development of a regulatory framework whose objectives are to encourage investment in facilities and to promote competition among facilities-based carriers.

5. The market for mobile wireless service in Canada, however, continues to be characterized by limited competition and, consequently, mobile consumers pay among the highest retail rates in the world. As shown in the chart below, Canadians get a lot less for their money than their counterparts in other OECD countries for wireless services, strongly suggesting that intervention is required to address the interests of Canadian consumers.¹

Number of GB for €30 – April 2017
(Mobile 4G plans with at least 1000 minutes voice, 3 Mbps download speed)



Source: Digital Fuel Monitor – Data caps and prices: country comparison. <http://dfmonitor.eu/prices/country/>

6. As noted by the Competition Commissioner, the three incumbent carriers (Bell Mobility Inc., Rogers Communications Partnership (RCP), and TELUS Communications Company, known collectively as the “national incumbent Mobile Network Operators” or “MNOs”) have market power in the provision of retail mobile wireless services.²

¹ Similarly, data from the OECD that shows that mobile wireless service prices in Canada are among the highest in any country, whatever the basket (service) chosen as a base of comparison. See OECD Digital Economy Outlook 2015, p. 120.

² Competition Bureau, Intervention in Wholesale mobile wireless roaming in Canada—Unjust discrimination/undue preference, Telecom Notice of Consultation CRTC 2013-685, 29 January 2014, paragraph 9.

The Bureau submits that the incumbents possess market power in retail mobile wireless services markets in Canada. The evidence put forward in the Brattle Report demonstrates that Canadian retail mobile wireless services markets are characterized by above-normal profits and comparatively low service penetration levels, both direct indicators of market power.³

7. In some regions, other entities have entered the market or have been acquired by other communications services providers⁴ at various times and in various localities to compete with the national incumbent MNOs. Where they do, consumers have benefited from lower prices,⁵ in particular in Vancouver and Toronto (Freedom Mobile⁶), in Montreal (Vidéotron) and in Halifax (Eastlink) (the “regional MNOs”). But the existing level of competition remains insufficient in the Canadian wireless market.
8. There are significant barriers to entry to the mobile wireless market, starting with the limited availability of cellular mobile spectrum. This scarce resource is essential to the provisioning of wireless services but there are few options available to a prospective new alternative wireless service provider seeking its own spectrum in order to operate as an MNO and there is no wholesale market to which a new alternative wireless facilities-based carrier can turn to for radio access network services for the purpose of operating as a full Mobile Virtual Network Operator (MVNO).
9. The release of mmWave spectrum offers the opportunity to improve this situation and Cogeco is very encouraged by ISED’s initiative on this front. The newly available spectrum would allow new parties to enter the market in competition with

³ See also Competition Bureau, Intervention in *Review of wholesale mobile wireless services*, Telecom Notice of Consultation CRTC 2014-76, 15 May 2014, paragraph 25.

⁴ As noted above, Wind Mobile Corp. was acquired by Shaw Communications in 2016. Public Mobile Inc. was acquired by Telus in 2013 and converted into a flanker brand in 2014. Data and Audio-Visual Enterprises Wireless Inc. d/b/a Mobilicity was acquired by Rogers Communications in 2015 following bankruptcy proceedings and converted into a flanker brand in 2016.

⁵ Competition Bureau statement regarding Bell’s acquisition of MTS, 15 February 2017, paragraph 3. See also Nordicity Group Ltd, *2016 Price Comparison Study of Telecommunications Services in Canada and Select Foreign Jurisdictions*, 22 March 2016, pages 32 and 59.

⁶ Wind Mobile Corp. was acquired by Shaw Communications in 2016 and re-named Freedom Mobile.

the existing MNOs (both the national incumbent MNOs and the regional MNOs). In addition, the availability of new spectrum is likely to encourage both existing MNOs and new entrants to bring innovative services and applications to the Canadian market as quickly as possible, particularly in a vibrantly competitive marketplace.

10. This release of significant amounts of mmWave spectrum for 5G, therefore, represents an important opportunity to promote innovation and competition in Canada. Cogeco strongly believes it is necessary to ensure that the licensing framework for the spectrum itself be forward-looking, accommodate new business models and services, and encourage the entry of new participants into the market.

11. When additional service providers enter a market, the ensuing increased competition for consumers serves to bring about innovation and other consumer benefits. The assignment of additional spectrum to MNOs already operating in a market may affect the quality or type of services they provide, but it is far less likely to increase the level of competition among those operators, spur the development of new and innovative services, or drive down prices for consumers.

12. For these reasons, ISED should adopt policies which encourage entry and facilitate the success of new wireless entrants. These policies include:

- designing band plans which accommodate new operators;
- defining smaller or more granular licensed service areas which enable timelier, more targeted, and more productive use of available spectrum;
- establishing spectrum set-asides for new entrants; and
- establishing strict limits on the amount of spectrum (whether licensed or licence-exempt) which existing MNO, in particular the national incumbent MNOs, may use.

13. Finally, Cogeco also encourages ISED to consider coherent strategies for the licensing of spectrum in the 600 MHz band and mmWave bands. Because of the band's propagation characteristics, a network relying on mmWave frequencies requires a greater number of sites to cover the same area compared to, for example, a 600 MHz band network.

General Comments

14. In the Consultation Document, ISED noted it was guided by the policy objective of the *Spectrum Policy Framework for Canada* and by the policy objectives set out in section 7 of the *Telecommunications Act*. ISED noted that it considered the development and deployment of 5G to be essential to Canada becoming a global centre for wireless innovation, and for creating a platform for sustainable growth allowing Canadian companies to take advantage of the latest technologies to better compete globally. Following from this, ISED stated its specific policy objectives for the release of the mmWave bands are:

- *to foster innovation and investment and the evolution of wireless network through the adoption of 5G technology to support sustained competition, so that consumers and business benefit from greater choice; and*
- *to facilitate deployment and timely availability of services across the country, including rural areas.*

15. In order to achieve these objectives, ISED proposed to release spectrum in the 28 GHz, 37-40 GHz and 64-71 GHz frequency bands. ISED also proposed to promote innovative and early adoption of 5G technology by making the first two bands available for mobile and fixed use under a "flexible use" licensing model, and the third band available on a licence-exempt basis.

16. Cogeco fully supports ISED's stated objectives, and is generally in support of the proposed release of mmWave spectrum in the 28 GHz, 37-40 GHz and 64-

71 GHz frequency bands. As detailed below, Cogeco proposes a number of changes in order to foster innovation and to spur investment in networks, alternative technologies, applications and business cases.

17. The deployment of 5G technologies supported by mmWave spectrum has the potential of being a positive and disruptive force in the market. 5G technologies will revolutionize broadband networks enhancing performance by orders of magnitude and enabling a wide range of use cases including Internet of Things (IoT). In this context, all broadband service providers, currently broadly categorized as fixed and mobile, will be impacted by 5G as the boundaries between fixed and mobile start to disappear.

18. The deployment timeline for 5G networks is fast approaching and accelerating as broadband service providers look to significantly enhance network performance and deploy 5G in the 2019/2020 timeframe. This timeframe is less than two or three years away, a very short timeline when discussing the deployment of new technologies on such a large scale.

19. In this context, before providing comments on the specific questions addressed in the *Consultation on Releasing Millimetre Wave Spectrum to Support 5G*, Cogeco first highlights that ISED has yet to provide any details regarding the release of the full suite of spectrum that will be required for the deployment of 5G networks.

20. Broadband service providers will require spectrum in a number of bands to effectively deploy 5G networks. This would include the very important 3.5 GHz spectrum band in addition to the 600 MHz band, for which a consultation was launched earlier this year by ISED.

21. Cogeco further highlights that the current mmWave consultation does not address the full set of mmWave bands that should be made available for 5G deployment. As a matter of fact, the total spectral capacity in the mmWave bands

covered by this consultation would not facilitate deployment by four or more broadband service providers in each service area considering the total amount of spectrum being discussed.

22. In particular, Cogeco notes the absence of the 24 GHz band which is being considered as part of the FCC Spectrum Frontiers proceeding, as it is an “attractive option for mobile use”.⁷

23. Cogeco also notes that the 26 GHz range is considered a Pioneer Band for 5G in Europe.⁸ Among other things, the 26 GHz range provides a potentially common tuning range with the US for equipment which would create commonality of scale for a broad frequency range from 24 GHz to 30 GHz.⁹ This would clearly be of benefit in Canada as well.

24. Therefore, Cogeco respectfully submits the following requests to ISED:

- a) to publish a timeline, even a tentative one, for the release of all spectrum for deployment. This would provide significant support for timely investment in 5G networks across all regions of Canada, and,
- b) to include the 24/26 GHz spectrum band(s) as part of the current consultation.

25. The remainder of this submission addresses selected questions posed by ISED in the Consultation Document. Where Cogeco does not address a specific question, this should not be construed as agreeing or disagreeing with the subject matter or as taking position on the specific issue. Cogeco will be interested in analyzing the

⁷ Report and Order and Further Notice of Proposed Rulemaking, GN Docket 14-177, FCC 16-89, paragraph 383

⁸ “Strategic Roadmap Towards 5G for Europe”, European Commission, RSPG16-032 FINAL, November 9, 2016 page 3.

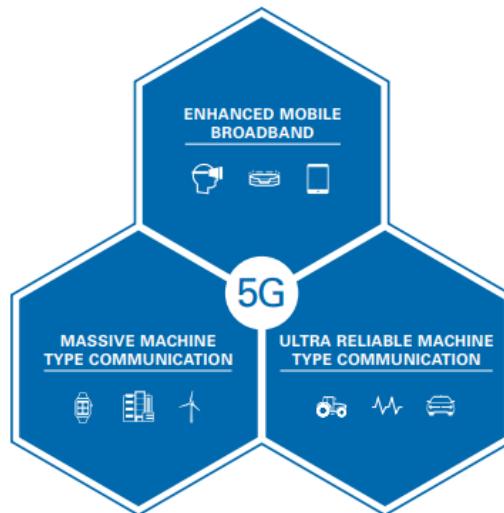
⁹ *Ibid*, page 5

submissions of other interested parties and reserves the right to comment in the reply phase.

Answers to Specific Questions

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.

26. Cogeco believes that 5G will be both disruptive and positive by facilitating new technologies, novel applications and creative business cases which will challenge the established way of doing things. Cogeco is also aware that many possible business models and network applications have been thoroughly canvassed by standards development organisations (such as IEEE, 3GPP, the ITU), vendors (such as Ericsson), technology forums and industrial partnerships¹⁰. These generally fall into one of the three high-level use categories described in the diagram below¹¹:



¹⁰ As an example: <https://5g-ppp.eu/wp-content/uploads/2015/02/5G-Vision-Brochure-v1.pdf>

¹¹ Sarah Yost, mmWave Product Manager, National Instruments, White paper: "Decoding 5G New Radio. The Latest on 3GPP and ITU Standards".

27. While Cogeco agrees that the availability of more spectrum will foster innovation, Cogeco also notes that many business cases and applications for 5G have not yet been determined, consistent with the disruptive nature of the technology. Cogeco encourages ISED to design licensing models, band plans and competitive safeguards which will spur innovation and the exploration of new applications which have not yet been developed.

28. This means that it is important to move forward with both enthusiasm and caution. 5G will involve greater service flexibility and enable mobile applications across new vertical sectors – doing so will require substantial investment, and therefore the government needs to provide business and technical flexibility to unlock the necessary investment.

29. For example, ISED should ensure that sufficient 5G spectrum is made available to small operators and start-up organizations, including those who have not yet entered the market, and not just to the existing MNOs. New operators and start-ups are the entities most likely to test innovative applications, new technologies and ground-breaking business plans. Similarly, the model applied to licence-exempt spectrum should also be designed so it does not primarily benefit the existing MNOs.

30. Accordingly, Cogeco strongly encourages ISED to establish set-aside spectrum for small or start-up operators in all three bands, and to establish licence-exempt spectrum in the 28 GHz and 37-40 GHz frequency bands, not just the 64-71 GHz band. Doing so would ensure a greater number of organizations would be able to use mmWave spectrum to support 5G technologies, which in turn would lead to greater innovation and investment as well as competition that is fair and sustainable.

31. This cautious approach can later be reversed by ISED should smaller or start-up operators fail to exploit this set-aside successfully. Failure to establish set-aside spectrum from the start could lead to all spectrum being under the control of existing

operators. They would consolidate their respective market power, stifling competition, and reversing or correcting this would be very difficult.

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.

32. Cogeco urges ISED to adopt policies which promote innovation and enable flexibility in order to maximize the benefits Canadians will derive from the use of the mmWave spectrum. For this reason, Cogeco agrees in principle with ISED's proposal to develop a flexible use licensing model for the 28 GHz and 37-40 GHz frequency bands.

33. However, Cogeco considers that many of the business models and applications which will be facilitated by the deployment of 5G networks have yet to be discovered. ISED also notes that the 5G technology standards are still being developed and that the WRC-19 (World Radiocommunication Conference 2019) is still a couple of years away.

34. ISED should therefore be prudent and deliberate in its approach to releasing and licensing 5G spectrum and may wish to wait until the standards take more definite shape before making final decisions on these matters. Cogeco recommends that, above all, ISED not make any decisions now which might favour the existing MNOs or which might otherwise potentially close the door to new operators and new ideas.

35. New operators and new ideas will be the key source of innovation and investment which will position Canada prominently on the global map, provide benefits to the Canadian economy and Canadian consumers, and which will allow

ISED to achieve its objectives. They must be encouraged and given an environment in which they can flourish.

36. Lastly, ISED should also consider the use of other mmWave bands like the 24-26GHz and others that are currently being considered by WRC-19 to support 5G technology in Canada.

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.

37. Cogeco notes ISED's proposal to divide the 28 GHz band into two sub-bands of 425 MHz each, consistent with the approach adopted by the Federal Communications Commission ("FCC") in the United States. Cogeco recognizes the advantages of aligning the band plan in Canada with that of the United States.

38. However, a band that only consists of two blocks cannot be licensed to more than two operators. Cogeco considers that ISED should ensure the band plan accommodates all operators, in particular alternative wireless service providers who may wish to offer innovative networks, applications and business plans.

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.

39. Cogeco notes that the FCC is still developing the band plan for the 37-40 GHz frequency band and agrees with ISED that adopting a Canadian band plan would be premature at this time. Adoption of a different band plan than the FCC's would jeopardize equipment harmonization and could drastically change the economics of deploying 5G in this country, and perhaps preclude the innovation and investment ISED seeks.

40. Cogeco recommends that ISED seek to adopt a band plan and, ultimately, a licensing framework which focuses on encouraging entry by new operators into the market, and not simply on allowing existing MNOs to increase their spectrum holdings. Entry by the former is more likely to bring the innovative ideas, increased competition and disruptive business models which will maximize the benefits to Canadians from releasing mmWave spectrum.

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.

41. Cogeco is generally supportive of the proposal to release the 64-71 GHz frequency band as licence-exempt spectrum. Licence-exempt use would facilitate innovation and the development of new applications and services which, in turn, would help achieve ISED's objectives. In addition, harmonizing with U.S. policies in this area will allow Canada to benefit from economies of scale, especially in applications involving consumer devices.

42. However, ISED must be careful to ensure that this proposal does not simply become the means for the existing MNOs to further consolidate their power in the market. For example, the 3GPP standards now include Licensed Assisted Access (LAA) which uses carrier aggregation in the downlink to combine any LTE licensed bands with unlicensed 5 GHz spectrum. This enables LTE operators to offer their customers greater bandwidth and higher data rates.

43. If this were extended to the 64-71 GHz band, the existing MNOs would gain a significant competitive advantage over those who operate exclusively in the licence-exempt frequency bands. This is because the existing MNOs would be using the licence-exempt band for data off-load purposes, and would maintain a reliable,

stable control channel in the LTE band, thereby ensuring for their customers a minimum standard of service.

44. Persons operating in the “no-protection, no-interference” licence-exempt frequency bands would not have this advantage. This would affect their ability to compete effectively with the existing MNOs and could discourage their entry into the market, resulting in lower investment and less innovation by new entrants.

45. Licensed spectrum and licence-exempt spectrum cannot be considered in isolation. The two are tightly linked and Cogeco encourages ISED to consider measures to ensure a level playing field among existing MNOs and new entrants when it considers the policies to be applied to the 64-71 GHz spectrum band.

Question 9-1: ISED is seeking comments on:

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

46. Cogeco supports policies which support innovation, the testing of new technologies and applications, and participation by a wide range of new operators using mmWave frequencies for 5G.

47. This, of course, would require ISED to adopt policies which maximize the flexibility of use of the mmWave frequency bands. Cogeco recommends, therefore, that both the 28 GHz and 37-40 GHz frequency bands be made available under flexible use policies permitting both fixed and mobile uses.

48. In addition, Cogeco recommends that a part of the 28 GHz and of the 37-40 GHz frequency bands be made available to users on a licence-exempt basis. This would provide users of the frequency bands the flexibility to try out new ideas and technologies.

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?

49. Cogeco focuses its initial response to this question on the critical elements of the geographic basis for spectrum award, band plans and spectrum set-asides.

50. Cogeco considers that, if ISED were to issue licences with service areas for competitive licensing, ISED should consider awarding spectrum in smaller areas, based on the grid cell concept. This would allow an operator to select the areas which it intends to serve without tying up spectrum in other areas which that operator does not intend to serve but other operators may wish to serve.

51. By more closely aligning licence areas with intended service areas in this manner, ISED would maximize the number of new operators and optimize the use of available spectrum. Greater geographic granularity would accommodate greater flexibility in service area definition, be more consistent with small cell deployment, attract smaller players, and, as a result, would better support a variety of 5G technologies, applications and business cases.

52. Alternatively, if ISED were to use the licensing service areas currently defined, it should consider, at a minimum, issuing these licences based on Tier-4 licence areas, and consider, for some cases, subdividing Tier-4 areas in order to provide a maximum of flexibility to the service providers to develop and support a variety of technologies, applications and business cases. For example, since grid cells align with, or “nest” within Tier-4 areas, groupings of grid cells could be used in special cases to create Partial-Tier-4 areas.

53. Even Tier-4 licence areas would, in Cogeco's opinion, impose a licence area that could be too large for the range of technologies, applications and new entrants expected to arise in the coming years. Cogeco notes that proposed licence awards for mid- and upper-band spectrum in the US are typically focused on smaller licence areas.

54. Furthermore, Cogeco submits that the rationale used by the FCC for 3.5 GHz should apply equally to ISED's consideration of license areas for mmWave licenses. In fact, given their even shorter reach than 3.5 GHz, mmWave frequencies will be "small cell" deployment.

55. The FCC's proposals for the 3.5 GHz "CBRS" band focus on licensing by Census Tract, of which there are 74,000 across the US each with population in the range of 4,000 people.¹² The FCC's sets out a number of reasons for using Census Tracts for 3.5 GHz:

- Census tracts provide a level of geography allowing for flexible and targeted network deployments, promoting intensive and efficient use of spectrum, but also allowing easy aggregation to accommodate a larger network footprint.¹³
- Census tracts nest into counties and other political subdivisions. In turn, they nest into the standardized license areas commonly used by the Commission (e.g. CMAs, EAs, and Partial Economic Areas).¹⁴
- Census tract-level licensing also aligns well with small cell deployment. Due to their low power and small size, small cells can provide broadband coverage and capacity in targeted geographic areas.¹⁵

¹² Report and Order and Second Further Notice of Proposed Rulemaking, GN Docket 12-354, FCC 15-47, April 21, 2015, paragraph 97

¹³ *Ibid*, paragraph 96

¹⁴ *Ibid*, paragraph 97

¹⁵ *Ibid*, paragraph 98

- The FCC's goal of "*providing economic opportunity to a wide variety of applicants*" is "*particularly compelling in light of the opportunities for participation with much lower capital investment requirements associated with smaller service areas...*"¹⁶ and,
- "*Traditional licensing areas will not allow users of the band to acquire (licenses) only for those specific geographic areas they intend to serve. Divesting large, unwanted swaths through secondary markets transactions could impose significant transaction costs. On the other hand, should users of the band desire to provide service within traditional geographic license areas, they can aggregate multiple contiguous census tracts, which as discussed above, nest into the standardized license areas commonly used by the Commission*".¹⁷

56. Small areas thus align well with small cell deployment and provide greater opportunity for a wide variety of operators, as noted by the FCC. Indeed, the FCC used a similar rationale in its approach to licensing on the basis of Counties for the 28 GHz band, as part of its Spectrum Frontiers proceeding. There are over 3,000 Counties in the US. The FCC notably states:¹⁸

"We believe there may be several advantages to county-based licenses. First, we believe county licenses best fit the localized types of services we expect to be offered in the mmW bands. These bands do not propagate well over long distances, and when used in mobile applications, are expected to provide coverage of areas measured in meters, not kilometers. Second, establishing smaller licenses could provide licensees with additional flexibility to target their deployments to those areas where they need the capacity. Under the existing framework in 28 GHz and 39 GHz, a licensee must meet buildout for its entire BTA or EA or lose its license. Establishing smaller license areas will allow licensees to base their deployment decisions on market forces and customer demand. If it does not make business sense for a licensee to

¹⁶ *Ibid*, paragraph 100

¹⁷ *Ibid*

¹⁸ FCC 16-89, *op.cit*, paragraph 33

build in a particular county, it can sell or lease the license for that county. Third, smaller license areas reduce the potential for warehousing spectrum; again, licensees will be more likely to acquire and hold only the licenses they need to meet their customers' demand. Fourth, county based licenses could equally facilitate access by both small carriers and large carriers. Smaller license areas allow smaller carriers to better tailor their spectrum acquisitions to the locations for which they need it the most. Smaller license areas would facilitate access by larger carriers because such carriers could both narrowly target the areas in which they need the additional spectrum or aggregate the counties—which serve as the building blocks for traditional license areas —into larger license areas, thus achieving economies of scale."

57. ISED already has the ability to create smaller license areas that nest into its existing Tier definitions for competitive licensing. And ISED's Tiers also generally align with Statistics Canada census divisions.¹⁹

58. As noted earlier, Cogeco also recommends ensuring that the band plan for every mmWave band can support four or more licensees as well as establishing spectrum set-asides in the licensed portions of the 28 GHz and 37-40 GHz frequency bands when ISED designs the licensing framework for those bands. This would encourage participation by new entrants.

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.

59. Cogeco considers that a dynamic access database is an interesting concept to be further examined, to the extent that it would provide increased flexibility for new operators, technologies, applications and business models. However, Cogeco notes

¹⁹ ISED "Service Area Definitions", per http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01627.html: The Tier 4 localized service area boundaries were initially developed using contiguous groupings of Statistics Canada's 1996 census subdivisions. During development, service area borderlines were placed through lesser populated and more remote areas, wherever possible, in order to minimize potential interference problems.

that it remains an untested concept and the details and reliability of the system remain unknown. ISED, therefore, should continue monitoring developments closely prior to implementing it in Canada.

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.

60. Cogeco notes ISED's comments regarding establishing longer licence terms in order to create greater incentives for financial institutions to invest in the telecommunications industry and for the telecommunications industry to invest in the development of network infrastructure, technologies and innovation.

61. However, 5G technology is still in its infancy and standards are still being developed. Cogeco expects significant innovation and development to take place in the near term. Where licences are issued with larger service areas and longer terms, licensees can more easily warehouse spectrum or not use spectrum over their entire service area for a length of time, for example, by rolling out networks in densely-populated areas to meet population coverage requirements while ignoring rural and remote regions. This would limit the degree of innovation and development that could otherwise take place in Canada, as the available spectrum would not be fully utilized, making it more difficult for ISED to achieve its objectives.

62. For this reason, Cogeco recommends ISED not consider longer term exclusive licences for mmWave spectrum if the applicable licence areas are Tier-4 or larger. The risk of spectrum warehousing is, in Cogeco's opinion, significantly reduced if ISED were to implement user-defined licence areas or Partial-Tier-4 licensing areas.

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.

63. As noted earlier, 5G technology is still in its early days. The standards are still being developed and the applications and uses which will be enabled by 5G technologies and supported by mmWave spectrum are not yet fully known. The approach adopted by ISED to the release and licensing of mmWave spectrum should be therefore explicitly designed to promote and accommodate innovation, alternative applications, business models, and participation by new entrants.

64. ISED has a number of tools at its disposal to achieve this design, including:

- a) designs for band plans which accommodate new operators;
- b) smaller licensed service areas (Tier-4 or Partial-Tier-4 areas based on grid cells);
- c) spectrum set-asides for new entrants; and
- d) limits on the amount of spectrum capacity which existing MNOs may use (whether licensed or licence-exempt).

65. Each of these can be deployed in different ways and to different degrees, and they may all be necessary if ISED is to achieve its objectives and if Canada is to benefit fully from the release of this new spectrum. Cogeco recommends that ISED consider all of the tools at its disposal when determining how best to release mmWave spectrum.

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