



19 February 2019

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**Re: DGSO-002-18 – Consultation on a New Set of Service Areas for Spectrum Licensing, November 2018 - Comments of BCBA, CanWisp, CCSA, ITPA, Cogeco Communications, ECOTEL, Sogetel and SSI Micro.**

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Dear Mr. Parsons,

In accordance with the procedures set out in the above-noted consultation, please find attached the comments of the British Columbia Broadband Association (BCBA), the Canadian Association of Wireless ISPs (Canwisp), the Canadian Communication Systems Alliance (CCSA), the Independent Telecommunications Providers Association (ITPA), Cogeco Communications Inc. (Cogeco), ECOTEL Inc. (ECOTEL), Sogetel Mobilité inc. (Sogetel) and SSI Micro Ltd. (SSi).

We thank ISED for the opportunity to submit comments in this proceeding.

Yours very truly

*Signed by the following parties:*

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**Innovation, Science and Economic Development Canada  
Spectrum Management and Telecommunications**

**Consultation on a New Set of Service Areas  
for Spectrum Licensing**

**Canada Gazette: November 27 2018  
Gazette Notice DGSO-002-18**

**Comments of  
British Columbia Broadband Association (BCBA), Canadian  
Association of Wireless ISPs (Canwisp), Canadian  
Communications Systems Alliance (CCSA), Independent  
Telecommunications Providers Association (ITPA), Cogeco  
Communications Inc., ECOTEL inc., Sogetel Mobilité inc.  
and SSI Micro Ltd.**



**19 February 2019**

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## **Executive Summary**

- ES1. This submission (the “Joint Submission”) is being filed collectively by the BC Broadband Association (BCBA), the Canadian Association of Wireless ISPs (Canwisp), the Canadian Communication Systems Alliance (CCSA), the Independent Telecommunications Providers Association (ITPA), Cogeco Communications Inc. (Cogeco), ECOTEL Inc. (ECOTEL), Sogetel Mobilité inc. (Sogetel) and SSi Micro Ltd. (SSi), referred to herein as “BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi”, in response to Innovation, Science and Economic Development Canada’s (ISED) *Consultation on a New Set of Service Areas for Spectrum Licensing*, Gazette Notice DGSO-002-18, 27 November 2018 (the “Consultation Document”).
- ES2. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi have prepared this Joint Submission as they are service providers or associations of service providers who have invested and who continue to invest heavily in telecommunications facilities across the country, and who have a common interest in improving access to spectrum resources by smaller regional and rural operators and by new entrants.
- ES3. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi commend ISED for this initiative to establish a new set of smaller service areas for competitive spectrum licensing. Smaller service areas are a much-needed tool to help ensure spectrum is used as efficiently as possible in order to maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum resource.
- ES4. ISED’s six proposed design principles are generally appropriate. However, they are not sufficient if ISED is to establish an effective set of new service areas. ISED must take two additional design principles into account, specifically that the new service areas should “*favour design rules which result in smaller, reasonable service areas over larger ones*” and “*ensure the boundaries serve the needs of local communities.*”
- ES5. Having assessed Options 1 and 2 against the design principles, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi submit that neither Option fully meets the design principles and both have shortcomings which make them unsuitable for the creation of new service areas.
- ES6. The goal of BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi is to establish a set of well-differentiated urban and non-urban Tier 5 service areas that are of a reasonable size in terms of population and area, that are practical in

terms of both administration by ISED and coordination among operators, and that make sense for the communities located within them. We propose that ISED adopt our Joint Proposal for the design of Tier 5 service areas, instead of either Option 1 or Option 2. The Joint Proposal recognizes the existence in Canada of very different urban, rural and remote areas, and applies a three-step process to define service areas in each:

- a. remote Tier 5 service areas are based on unorganised CSDs with population densities of 0.1 persons per square kilometre or less;
- b. urban Tier 5 service areas are based on Statistics Canada's population centres larger than 5,000 persons with the largest population centres subdivided along CD boundaries; and
- c. rural Tier 5 service areas would be based on Census CSDs, CCSs or ADAs to create a reasonable number of service areas across the country.

ES7. In the event ISED does not adopt the Joint Proposal, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that ISED's Option 1 with certain critical modifications would most closely resemble the Joint Proposal. Urban CSDs would need to be combined to no more than the level of CDs (ensuring secondary core CSDs remain separate Tier 5 service areas), rural CSDs would need to be divided along ADA boundaries or combined by CCSs (whichever results in Tier 5 service areas with a target population range of 5,000 to 15,000) and remote areas of the country would need to be considered separately from rural areas. However, even with these modifications, Option 1 would not satisfactorily address the need to clearly distinguish urban from rural areas, or as a result adequately meet ISED's first design principle. For this reason, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider the Joint Proposal to be more effective than either Option.

ES8. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi also emphasize that this initiative is a necessary and critical first step to ensuring the efficient use of spectrum in Canada. It is, however, not sufficient by itself to achieve this objective. Additional licensing and policy measures, such as spectrum set-asides, strong subordination requirements, alternative assignment methods, alternative auction formats, and effective spectrum use obligations, will also be required.

## **Preface**

1. This submission (the “Joint Submission”) is being filed collectively by the BC Broadband Association (BCBA), the Canadian Association of Wireless ISPs (Canwisp), the Canadian Communication Systems Alliance (CCSA), the Independent Telecommunications Providers Association (ITPA), Cogeco Communications Inc. (Cogeco), ECOTEL Inc. (ECOTEL), Sogetel Mobilité inc. (Sogetel) and SSi Micro Ltd. (SSi), referred to herein as “BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi”, in response to Innovation, Science and Economic Development Canada’s (ISED) *Consultation on a New Set of Service Areas for Spectrum Licensing*, Gazette Notice DGSO-002-18, 27 November 2018 (the “Consultation Document”).
2. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi have prepared this Joint Submission as they are service providers or associations of service providers who have invested and who continue to invest heavily in telecommunications facilities across the country, and who have a common interest in improving access to spectrum resources by smaller regional and rural operators and by new entrants. All of them, for example, asked during ISED’s consultation on the technical, licensing and policy framework for 600 MHz spectrum<sup>1</sup> that ISED make licences available in service areas smaller than Tier 4 service areas.

### **How to cite this submission**

3. The parties to this submission request that they always be referred to as “BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi” when the contributors to this submission are cited. The parties reserve the right to file individual reply comments in accordance with the procedures of the Consultation Document.

## **Introduction**

4. The BCBA is a group of telecommunications service providers, equipment suppliers and infrastructure constructors in Western Canada representing internet service providers who operate in both rural and urban parts of British Columbia.

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<sup>1</sup> *Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band*, SLPB-005-17, August 2017.



5. Canwisp is an organization representing Canadian Wireless Internet Service Providers (WISPs). WISPs are facility-based service providers using mainly fixed wireless access – but in some cases also cable and fibre – to deliver services to rural households and businesses. Canwisp members are entrepreneurs and innovators who build and operate fixed wireless and wireline networks to provide reliable, fast, affordable broadband internet service in their communities. Overall, Canwisp includes some 50 network operators as members providing service to approximately 160,000 subscribers in hard to reach rural and remote areas in 8 provinces. In addition, Canwisp includes some 41 industry partners as members.
6. We estimate there are also approximately 100 WISPs who are not members of Canwisp who provide service to an additional 150,000 subscribers, for a total WISP subscribership of some 310,000 subscribers and corresponding revenues of over \$100M a year. We estimate that approximately 6.5% of Canadian households rely on WISPs or satellite for their internet. Subscribership for individual WISPs range from a few hundred to 25,000.
7. WISPs have demonstrated their ability to innovate and provide a range of services including Internet, IPTV and VOIP, at affordable prices to their residential and business customers in rural communities where the national players, the large spectrum owners, do not currently provide service. These communities are often overlooked by larger telecom operators whose business model optimizes return to shareholders and is not suited to provide service in these areas, even close to large population centres. In summary, WISPs are a critical component in the delivery of broadband services in rural communities and in the wider Canadian telecommunications industry.
8. The CCSA speaks for independent communications distributors – smaller broadcasting distribution companies, telephone companies and ISPs – across Canada. CCSA represents more than 110 companies operating from sea to sea, including across the North. CCSA members serve more than 1,200 communities throughout Canada, including some of the country's lowest population-density and most geographically challenging areas.
9. The ITPA represents twenty-one independent local exchange carriers that together serve over 180,000 access lines across rural Ontario, British Columbia, and Quebec. ITPA member companies are providers of wireline local, long distance, broadband and broadcasting services to both business and residential customers. They provide their customers with a full range of local telecommunications services – from digital phone service, to Internet, wireless and advanced information systems as well as television services
10. 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.

11. ECOTEL is a registered Wireless Service Provider licensed in several areas across Canada to operate wireless LTE networks addressing markets in remote regions where other wireless service providers provide limited services. ECOTEL's primary mission is to design, deploy and operate highly secured private LTE cellular networks targeted to mission critical and specialized industrial applications for the Oil, Mining and Utilities markets.
12. Sogetel is a Quebec-based company providing a complete range of telephone, television, Internet and mobile telecommunications services to residential and business customers in rural territories in the regions of Chaudière-Appalaches, the Mauricie, the Montérégie and the Centre-du-Québec.<sup>2</sup>
13. SSI specializes in the design, deployment and operation of innovative and cost-effective communications networks to support the needs of communities with little to no terrestrial access to the outside world. SSI has deployed advanced satellite networks and local wireless facilities that deliver communications services throughout Nunavut under the "QINIQ" brand, and in communities of the Northwest Territories, an area spanning over three million square kilometres. SSI is now completing major investments into 4G-LTE and 2G-GSM last-mile technologies. These have allowed SSI to launch mobile voice and broadband data into all 25 Nunavut communities and communities in the Northwest Territories. SSI Mobile is the first-ever cellular service for sixteen of those communities.
14. Together, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI represent over 200 operators providing services to Canadians from coast to coast.

## **Summary of Joint Submission**

15. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI welcome this initiative by ISED to establish a new set of smaller service areas for use in competitive licensing processes. Indeed, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI have advocated for this in a number of prior ISED proceedings, House of Commons Standing Committee studies and other fora. If properly designed, new "Tier 5" service areas may help improve access by

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<sup>2</sup> Sogetel is also a member of ITPA.

smaller, rural, remote area and regional operators to critical spectrum resources in the areas they serve. This in turn allows those operators to deploy high quality wireless networks and innovative broadband services to Canadians in rural and remote areas.

16. In the Consultation Document, ISED proposes a set of design principles to guide the creation of a new set of service areas. ISED then sets out two proposals for new, smaller service areas based on those principles: an “Option 1” which would base the Tier 5 service area boundaries on the boundaries of Statistics Canada’s 2016 census subdivisions (CSDs) and an “Option 2” which would base the Tier 5 service area boundaries on Statistics Canada’s 2016 census population centres.
17. In this Joint Submission, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI will first comment on ISED’s proposed design principles for new service areas and will then review in turn the strengths and shortcomings of both Option 1 and Option 2. The fourth section of the Joint Submission will outline our Joint Proposal for the definition of Tier 5 service areas and the fifth will review several initiatives by regulators in other countries addressing similar issues to design spectrum service areas.
18. The final section of the Joint Submission will describe the other actions and initiatives that ISED must undertake if it is to achieve its stated policy objectives to:
  - *Improve access to spectrum, furthering more efficient usage across Canada*
  - *Address the unique geographical distribution of Canada’s population, allowing for greater flexibility in the design of licensing frameworks*
  - *Better address new and different services, technologies, applications and use cases* (Consultation Document, par. 26)
19. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI agree with these policy objectives and consider that establishing new smaller service areas is a critical first step. However, ISED cannot stop there as new service areas will not achieve the policy objectives by themselves.

## **Design Principles**

### **Question 1: Design principles**

**Q1A—ISED is seeking comments on the proposed design principles when providing responses, include supporting arguments for or against the proposed principles.**

**Q1B—ISED is seeking any suggestions on additional design principles that should be considered.**

20. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi urge ISED to adopt policies that promote equitable access to spectrum in all regions of Canada. In this regard, we are encouraged by ISED's stated commitment to *"developing licensing policies that consider ongoing service provision in rural areas ensuring that Canadians in all areas of the country have access to the latest technologies, including 5G"* (Consultation Document, par. 9).
21. In support of this commitment, ISED proposes to follow six principles for the design of spectrum licence service areas:
- *Recognize geographic differences: consider the unique characteristics of urban and rural areas in Canada*
  - *Foster demand: areas should have either a population base or some economic value to support commercial viability*
  - *Maintain technological and competitive neutrality: not favouring or discriminating against one technology or group of stakeholders over another*
  - *Ensure boundaries are in low population areas to minimize potential interference issues.*
  - *Ensure areas nest within the existing Tier 4 service areas to maintain continuity with ISED's existing licensing structure.*
  - *Use the ISED's existing grid cells as constituent building blocks* (Consultation Document, par. 36).
22. To the extent that these design principles will facilitate the assignment of spectrum in all regions of Canada to operators who will use it, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi support them in general, with some clarifications as discussed below.
23. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi believe it is important to express these principles as precisely and thoroughly as possible. Therefore, we recommend the following changes:
- Add an explicit reference to "remote" areas to the first design principle;

- Replace “maintain technological and competitive neutrality” in the second design principle with “ensure technological neutrality and encourage competition”; and
  - Qualify the fifth design principle by prefacing it with the words “When it does not conflict with another principle,” so as to recognize that the objective of nesting Tier 5 service areas within existing Tier 4 areas is subject to adjustment if the consequences violate other principles by, for example, bisecting population centres or other communities of interest.
24. However, it is also our strong view that ISED’s design principles must be supplemented if they are to achieve ISED’s objectives. In particular, it is essential to consider two additional design principles if ISED is to establish an effective set of new service areas.

### **Adapt Design Rules to the Reality of the Area to Which They Apply**

25. The first of these additional design principles is:
- *Favour design rules which result in service areas that will be adapted to the reality of their environment*
26. There is no reason why ISED should not adopt criteria that are different in urban, rural and in remote areas to help facilitate achieving its policy objective of maximizing the economic and social benefits that Canadians derive from the use of the radio frequency spectrum, including in rural and remote regions, as noted in paragraph 22 of the Consultation Document. In other words, ISED should not try to adopt a one-size-fits-all approach that will work in one type of area, say rural, but will limit the potential in other types such as urban or remote.
27. For instance, creating Tier 5 areas around population centres of 2,000 people or more might make sense in most rural areas of Canada given the population density, the number of service areas that would be generated by this threshold and the affordability of spectrum licences that would result in the creation of service areas just the right size for operators serving the area, but it would bring little benefit to operators investing in remote areas where most population centres are smaller than 2,000 people.
28. Adapting the service areas to the reality of the environment also means considering the geography of the area, not just the population density. Service areas will need to take into consideration topography and radio propagation characteristics rather than solely rely on Statistics Canada administrative boundaries. For instance, dividing a mountainous area in British Columbia along the river that runs at the bottom of the valley might make sense from a census

administration perspective, but radio waves will not stop at the river, resulting in increased coordination requirements across the boundary. The requirement to consider topography is discussed further in the next section of this submission.

29. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI also urge ISED to recognize that Statistics Canada census geographies - whether Census Divisions (CD), Census Consolidated Subdivisions (CCS), Census Subdivisions (CSD), or Census Aggregated Dissemination Areas (ADA) - do not necessarily follow the same underlying principles across Canada. For instance, the use of CSDs in New Brunswick, Quebec and PEI would result in an unreasonably high number of service areas compared to Nova Scotia, Ontario or Saskatchewan. Using CDs instead in the case of New Brunswick, however, would cause some of its major population centres such as Fredericton, Moncton and Saint John to be unnecessarily divided by Tier 5 boundaries.
30. Additionally, service areas adapted to the reality of their environment need to take into consideration the peripheral area around population centres whose growth rates are higher. For example, the creation of a Tier 5 service area around Milton, Ontario would necessarily need to consider the growth in population experienced by the city. Otherwise, the new Tier 5 area risks excluding new suburban developments in a few years. A possible solution in cases like these would be for ISED to smooth out population centres boundaries by adding a few grid cells outside of the current limits of slow growth population centres and increase the number of grid cells beyond that figure for population centres with growth rates above a certain threshold.
31. In addition to solving issues generated by the use of a one-size-fits-all approach, a decision to use service areas adapted to the reality of their environment will afford ISED the maximum flexibility possible as it designs licensing frameworks in the future, as it does not prevent operators from acquiring spectrum licences for larger serving territories by aggregating adjacent service areas where necessary for their business plan. ISED can also choose on case-by-case basis to combine smaller service areas into larger areas for a specific auction process where it might make sense for a given spectrum band, without necessarily being limited to using existing higher Tier service areas.
32. In its *Spectrum Outlook 2018 to 2022*,<sup>3</sup> ISED anticipated releasing significant amounts of millimetre wave (mmWave) spectrum in the near- to medium-term. Smaller spectrum licence service areas are well suited to mmWave spectrum bands because of the propagation characteristics of that spectrum.

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<sup>3</sup> SLPB-003-18, 16 June 2018.

33. With the technological and network design changes noted by ISED which increase the ability of operators to coordinate systems in smaller areas, service areas adapted to the reality of their environment should also be used for the assignment of mid-band frequencies (i.e. not just mmWave bands).

*ISED recognizes that advancements in technology and network design will further the ability of service providers to coordinate in smaller service areas. For example, technologies such as Multiple Input, Multiple Output (MIMO) networks (with narrow, steerable beams) and Time Division Duplex (TDD) technology (with synchronization between systems) are expected to help minimize potential interference at service area boundaries.*

(Consultation Document, par. 21)

34. Development of these technologies is ongoing. Service areas adapted to the reality of their environment will therefore increasingly be an effective tool to help achieve ISED's third policy objective (better addressing new and different services, technologies, applications and use cases).
35. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI acknowledge that the use of service areas adapted to the reality of their environment could increase the complexity of licence assignment processes, as there would be more combinations of spectrum blocks and service areas to manage. However, this complexity can be managed through the proper design of service areas. Our Joint Proposal below results in a reasonable and manageable number of service areas while retaining the benefits noted above. ISED does not need to sacrifice flexibility in licensing framework design in exchange for a manageable number of service areas.
36. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI consider that the sizes of the service areas created by the Joint Proposal in each of the urban, rural and remote regions of Canada are appropriate. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI would not object to ISED adopting a methodology which results in smaller service areas but would not support one which would lead to larger service areas than proposed below.

### **Common Sense Should Prevail Over Design Rules**

37. The second of these two additional design principles is
- *Ensure the boundaries serve the needs of local communities.*
38. The establishment of new spectrum licence service areas is not an end in and of itself. Rather, it is a means to facilitate the assignment of spectrum resources to

operators who will use them to serve Canadians in all areas of the country. If the mechanical application of design principles and rules leads to results which do not best serve the affected communities, the new service areas will not achieve the desired objectives for those communities.

39. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi have identified the following types of situations where the application of design rules based on Statistics Canada census boundaries can lead to spectrum service area boundaries that do not adequately serve local communities or meet the legitimate needs of the operators who want to serve them. Those boundaries need to be adjusted so that the service areas are suited to the needs of the communities and operators, and support ISED's objectives:
- Boundaries that bisect population centres or other communities of interest;<sup>4</sup>
  - Boundaries that ignore local topography; and
  - Boundaries that separate existing transmission sites from the communities they serve.
40. In the first situation, the methodology for determining service area boundaries might result in certain population centres being bisected by those boundaries, or might exclude a neighborhood from a service area even though the neighborhood and the service area are contiguous and effectively part of the same community (see, for example, the list in Appendix A of population centres intersected by Tier 4 service area boundaries). In these circumstances, an operator in that community might either have to forego serving part of its community, potentially resulting in underserved areas, or acquire spectrum licences for more areas than it would otherwise have needed, potentially resulting in underutilized spectrum. The results of the methodology for determining service area boundaries would therefore not have best served that community.
41. While BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi support ISED's fifth design principle (areas nest within existing Tier 4 service areas), Tier 5 service areas must properly serve the needs of communities in Canada. If the application of two design rules should lead to conflicting results, we recommend that the design principle of "ensuring boundaries serve the needs of local communities" take precedence. However, an option to ensure all design

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<sup>4</sup> Such as First Nations reserves.



rules are respected would be to shift a Tier 4 boundary by a grid cell or two so that communities are no longer divided by the Tier 4 boundary.<sup>5</sup>

42. In the case of the second situation, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI note that boundaries developed by Statistics Canada for its own purposes might not be suitable in all cases for the purposes of spectrum licence service areas. For example, the boundaries of a number of CSDs run down the bottom of river valleys or along major highways through areas where a population resides. A valley bottom or a highway might be a useful boundary for census purposes but it may be unsuitable as a boundary for a spectrum serving area if it divides a populated area. Further depending upon the topography of the region, it might not be practical for one operator to serve one side of the area and another operator to serve the other (for example, a narrow valley). In these circumstances, it may be appropriate to shift the boundary of the Tier 5 service area away from the boundary generated by Statistics Canada to the ridge on one side or the other of the valley or further away from the highway so that the boundary can fall within an unpopulated or less-populated area (see Appendix B for some examples). This would be consistent with ISED's fourth design principle (ensure boundaries minimize instances of interference).
43. Boundaries along highways present an additional difficulty. Residents in those remote and rural areas that are served by highways have emphasized to the Canadian Radio-television and Telecommunications Commission and other bodies the importance they attach to mobile service along highways for safety, security and commercial purposes. Establishing boundaries on highways could, paradoxically, delay the deployment of services that meet this need, if the licensee in one Tier 5 area must always coordinate with adjacent licensees to avoid interference in exactly the portion of the service area – the highway – that drives the business case for service.
44. With respect to the third situation, existing wireless networks have been deployed to conform to ISED's current spectrum service area boundaries, among other requirements. In short, transmission sites have been located where they can best serve a community and have generally not taken into account Statistics Canada census boundaries.
45. Because of this, these sites are not always within the census population centre or CSD boundaries of the community being served. If Tier 5 service area boundaries were established mechanically along those Statistics Canada boundaries, an operator might find its optimal transmission site located outside the licence area for the community it wishes to serve. That operator would be

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<sup>5</sup> Alternatively, ISED could relax the application of the fifth design principle.

forced either to forgo serving the community (to the clear detriment of that community), to locate its equipment at a suboptimal site, or to acquire the licence for the service area in which the transmission site is located (which might not be the most efficient use of that spectrum). None of these outcomes are in the best interests of Canadian consumers or businesses.

46. Our Joint Proposal is designed to minimize such occurrences. However, they can occur. It is necessary, therefore, to review the proposed service area boundaries which are generated by the methodology ultimately chosen by ISED and to adjust them manually if and when necessary.
47. Further, while BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI have identified a number of problematic situations and listed them in the appendices to this Joint Submission, those appendices are by no means exhaustive. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI invite other respondents to the Consultation Document to contact our representative, Marc Carrier, at [marc.carrier@cogeco.com](mailto:marc.carrier@cogeco.com) or 514-764-4600 ext. 4360, if they are aware of other places where Statistics Canada population centre or CSD boundaries would not serve well the local communities as Tier 5 service area boundaries. Updated appendices would be provided with our reply comments.
48. In addition, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI strongly believe that ISED should not merely publish a decision on the design principles and rules that it will adopt for setting new service area boundaries. ISED must also publish maps of these preliminary service area boundaries and must afford stakeholders an opportunity to review them and to propose necessary changes to address any other boundary issues that have not yet been identified. This is a critical step in ensuring proposed Tier 5 service area boundaries best serve all Canadians.

## **Review of Option 1**

### **Question 2: Option 1 - Boundaries based on Statistics Canada 2016 census subdivisions**

**Q2A—ISED is seeking comments on the suitability of Option 1 in addressing the proposed design principles.**

**Q2B—ISED is seeking comments on whether adjacent urban CSDs should be combined into a single service area.**

**Q2C—ISED is seeking comments on whether there should be a minimum or maximum size for the service areas and if very small CSDs should be amalgamated into the larger surrounding or adjacent CSD.**

**Q2D—ISED is seeking comments to gauge if this option is suitable for northern and rural areas.**

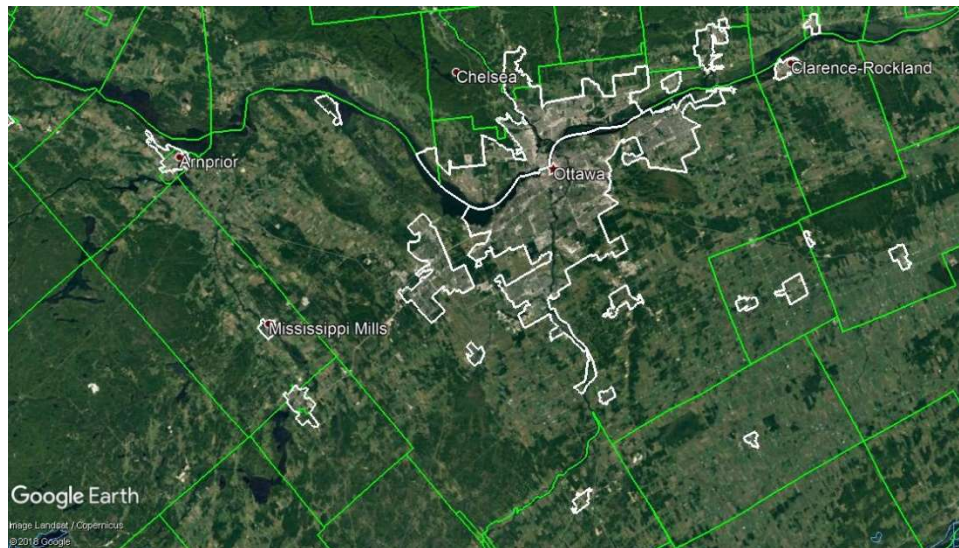
49. ISED's Option 1 proposes to base the boundaries for new Tier 5 service areas on the boundaries of Statistics Canada's census subdivisions (CSDs). CSDs are themselves based upon provincially-defined municipal political boundaries or the equivalent.<sup>6</sup>
50. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that CSDs are aggregated by Statistics Canada to form, among other things, Census Divisions (CDs).<sup>7</sup> ISED's Tier 4 service areas are based on the boundaries of the CDs used for the 1996 Census. New spectrum service areas based on CSDs will, by definition, "nest" into ISED's Tier 4 service areas and, therefore, address quite well the fifth design principle proposed by ISED.
51. However, new service areas based on CSDs might not address as effectively the other design principles. For instance, a CSD could include extensive rural areas in addition to an urban core. The CSDs for the City of Ottawa and the City of Abbotsford, for example, both include an urban core and an extensive rural zone surrounding the city (in the images below, the urban core is represented by the Statistics Canada population centre boundaries).<sup>8</sup> Service areas based on these CSDs would therefore not adequately recognize the unique characteristics of

<sup>6</sup> See "Census Subdivision (CSD)" in Statistics Canada, *Dictionary, Census of Population 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo012-eng.cfm>

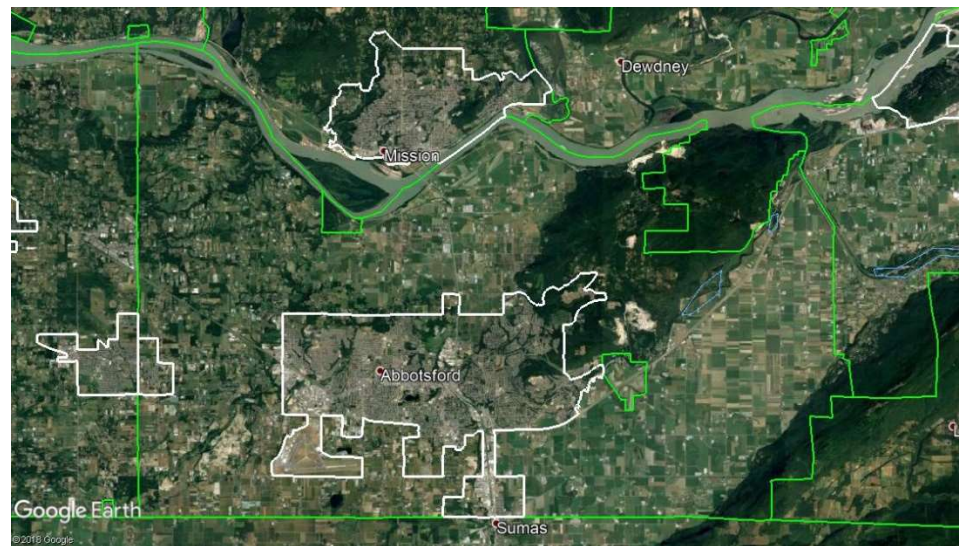
<sup>7</sup> See "Census Division (CD)" in Statistics Canada, *Dictionary, Census of Population 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo008-eng.cfm>.

<sup>8</sup> Population centre boundaries are indicated in white and CSD boundaries are indicated in green.

urban and rural areas in Canada, which is a requirement of the first design principle.<sup>9</sup>



Ottawa CSD



Abbotsford CSD

52. There is also a great variation in sizes of geographic areas of CSDs across the country, ranging from 0.02 square kilometres to 988,300 square kilometres. As mentioned in the previous section, they tend to be smaller in Southern and Eastern Quebec and PEI, and extremely large in the northern Territories, and the northern parts of Manitoba, Ontario, Quebec. Similarly, population counts within CSDs vary quite widely across the country, ranging from 0 to 2,731,571.

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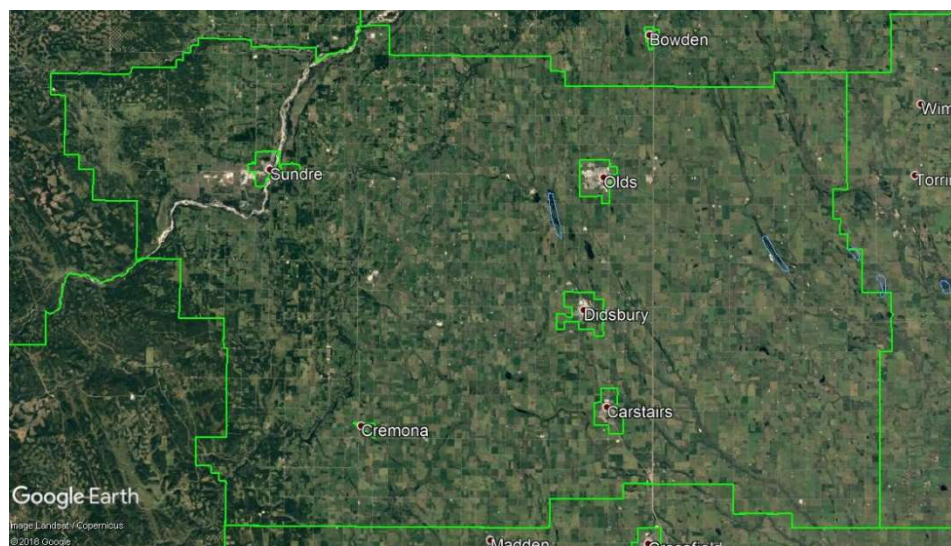
<sup>9</sup> Although CSD-based Tier 5 service areas would in any event better satisfy the first design principle than the existing Tier 4 service areas.



53. Many of the smaller CSDs, measured either by population or by geography, are embedded within larger CSDs. While there are many examples across the country, two illustrative examples are the several small Indian reserves (census subdivision type “IRI”) embedded within the Alnwick/Haldimand CSD northeast of Coburg, Ontario, and the five smaller CSDs (Sundre, Olds, Didsbury, Carstairs, Cremona) embedded within the larger Mountain View County CSD in Alberta (see images below).<sup>10</sup> Tier 5 service areas based on these “donut holes” might not make sense as spectrum licence serving areas, as some may be inappropriately small.



Alnwick/Haldimand CSD



Mountain View County CSDs

<sup>10</sup> CSD boundaries indicated in green.

54. Because of the great variation among CSDs from one province to the next, CSDs do not result in Tier 5 service areas which are reasonably coherent or consistent across the country. However, setting a minimum threshold for the land area or for the population within a Tier 5 area is not an effective solution as it can lead to unacceptable or impractical results across the country: because of the variety of sizes, a threshold that might make sense for CSDs in one province or territory might not in another.
55. Instead of setting a minimum population threshold, a solution may be to use Statistics Canada's Aggregate Dissemination Areas (ADAs)<sup>11</sup> to divide very large CSDs, and to use Statistics Canada's Census Consolidated Subdivisions (CCSs)<sup>12</sup> to merge small CSDs into adjacent CSDs. Population and dwelling counts of the resulting Tier 5 service areas could easily be determined while the range of Tier 5 service areas would be more consistent and coherent. This is discussed in greater detail below at paragraphs 110 and following in the section detailing the Joint Proposal.
56. This approach however may be less effective in the north at achieving ISED's objectives, given that ADAs are often the same as CSDs and as CCSs, and often are very large. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI believe that remote areas of the country with extremely low population density must be addressed separately from rural areas, and this is a feature of our Joint Proposal below.
57. ISED suggests at paragraph 44<sup>13</sup> of the Consultation Document that a variation of Option 1 might be to combine adjacent urban CSDs to form a larger Tier 5 service area. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI could not favour this approach unless ISED agreed to recognize the requirement to adapt the design of the Tier 5 layer to the reality of urban, rural and remote regions of Canada. Urban CSDs are often already quite large and do not need to be merged with adjacent CSDs. Further, operators interested in serving an entire urban area can acquire the adjoining Tier 5 service areas necessary to do so – it is not necessary for ISED to combine them in order to facilitate the use of the spectrum in urban areas.

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<sup>11</sup> See "Aggregate Dissemination Area (ADA)" in Statistics Canada, *Dictionary, Census of Population: 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo053-eng.cfm>

<sup>12</sup> See "Census Consolidated Subdivision (CCS)" in Statistics Canada, *Dictionary, Census of Population: 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo007-eng.cfm>

<sup>13</sup> And includes in question Q2B.

58. In the event ISED does determine to combine urban CSDs, however, there are natural limits to such mergers. A CSD which is a secondary core<sup>14</sup> of a CMA in a different CD, for example, should remain in a separate Tier 5 service area as it is a separate political and economic centre.
59. In addition, the maximum size for a Tier 5 service area outside urban areas should be a CD (although it should be noted that a CD is too large to be an appropriate basis for a Tier 5 service area in many cases).
60. Further, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that, because they are based on political boundaries,<sup>15</sup> small CSDs may not reflect the topography of a community or the challenges of establishing a wireless network to serve the area. For example, the best site to serve a small town might be located outside the town. Similarly, the best site to serve an area outside a town might be located within the town. If the serving area is limited to a small CSD, this might preclude an operator from siting its equipment in the optimal location.
61. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider, therefore, that while Option 1 has a few advantages and satisfies some of the design principles, it would need to be modified in order to better serve as the basis of Tier 5 service areas.
- Option 1 does not adequately distinguish between urban and rural areas.
  - The sizes of CSDs range from the impractically small to the unacceptably large.
  - Option 1 does not reflect how local conditions may affect network design.
62. The shortcomings of Option 1 could be mitigated if urban CSDs were combined to no more than the level of CDs, if some rural CSDs were divided by ADAs or combined by CCSs (whichever results in Tier 5 service areas with a target population range of 5,000 to 15,000) and if remote areas of the country are considered separately from rural areas. However, none of these modifications to Option 1 satisfactorily address the need to clearly distinguish urban from rural from remote areas. The BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi Joint Proposal addresses this issue.

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<sup>14</sup> For concept of “secondary core”, see “Core, fringe and rural area” in Statistics Canada, *Dictionary, Census of Population 2016* –<https://www150.statcan.gc.ca/n1/pub/92-195-x/2011001/geo/rur/rur-eng.htm>

<sup>15</sup> And not necessarily geographic or population boundaries.

## **Review of Option 2**

### **Question 3: Option 2- Boundaries based on population centres**

**Q3A—ISED is seeking comments on the suitability of Option 2 in addressing the proposed design principles.**

**Q3B—ISED is seeking comments on the proposed minimum population for small population centre service areas. A rationale should be provided if a different population is proposed.**

**Q3C—ISED is seeking comments on whether the “other” service areas (remainder areas in each Tier 4) should be licensed differently (e.g. on a shared or first-come, first-served basis).**

**Q3D—ISED is seeking comments on whether this option is suitable for northern or rural areas.**

**Q3E—ISED is seeking comments on whether population centres, which have adjacent boundaries, should be amalgamated to form a single service area.**

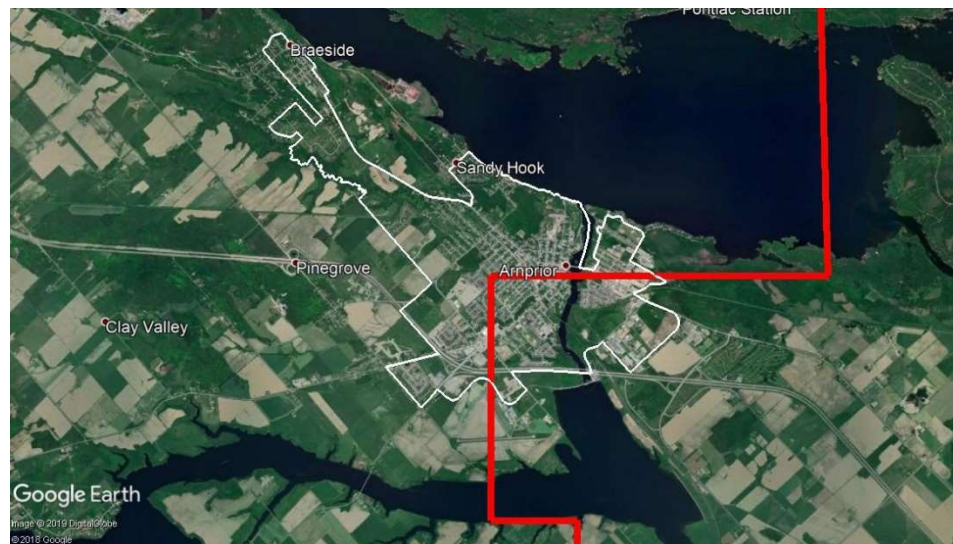
63. ISED’s Option 2 proposes to base the boundaries for new Tier 5 service areas on the boundaries of Statistics Canada census population centres. These are areas with a population of at least 1,000 and a population density of 400 persons or more per square kilometre.<sup>16</sup> Under ISED’s proposal, population centres of at least 2,000 persons would be carved out from the relevant Tier 4 service area to form individual Tier 5 service areas, while the rest of the Tier 4 service area (referred to by ISED in paragraph 50 of the Consultation Document as the “other area”) is proposed to be a Tier 5 service area of its own.
64. The effect of this approach would be to emphasize ISED’s first design principle (recognize geographic differences, in particular urban versus rural areas) because the key criterion would be urbanization as measured by population density.
65. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that the fifth design principle (nesting within existing Tier 4 service areas) would also be addressed to some degree, as the new Tier 5 service areas would either be carved out of a Tier 4 service area or would be the “remainder” of the Tier 4 service area in question. However, Option 2 would not meet the fifth design principle equally well in all cases.

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<sup>16</sup> See “Population centre (POPCTR)” in Statistics Canada, *Dictionary, Census of Population 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo049a-eng.cfm>



66. This is because some Statistics Canada census population centres are bisected by existing Tier 4 service area boundaries. In order to accommodate fully the fifth design principle, the population centre would have to be split in two, but the resulting Tier 5 service areas (i.e. one on either side of the Tier 4 service area boundary) might not make practical sense. The population centre for the town of Arnprior, Ontario, for example, is currently divided by the boundary between the 4-055 Ottawa/Outaouais and the 4-057 Renfrew/Arnprior Tier 4 service areas and their corresponding Tier 3 areas. Strict adherence to the “nesting” design principle would mean the town of 10,426 persons and 12.12 square kilometres<sup>17</sup> would be served by two Tier 5 service areas. It is in situations like these that the need for the design principle focused on serving the needs of local communities as proposed by BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi becomes very apparent.



Arnprior Population Centre<sup>18</sup>

67. It is clear that being able to acquire spectrum in one or two smaller Tier 5 service areas would be an improvement over the current situation where an operator seeking to serve the town would need to acquire a licence covering the entire 4-055 Ottawa/Outaouais service area just in order to serve the eastern part of the town, in addition to a licence for 4-057 Renfrew/Arnprior.
68. However, the objective of BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi is to develop Tier 5 service areas which make sense for a

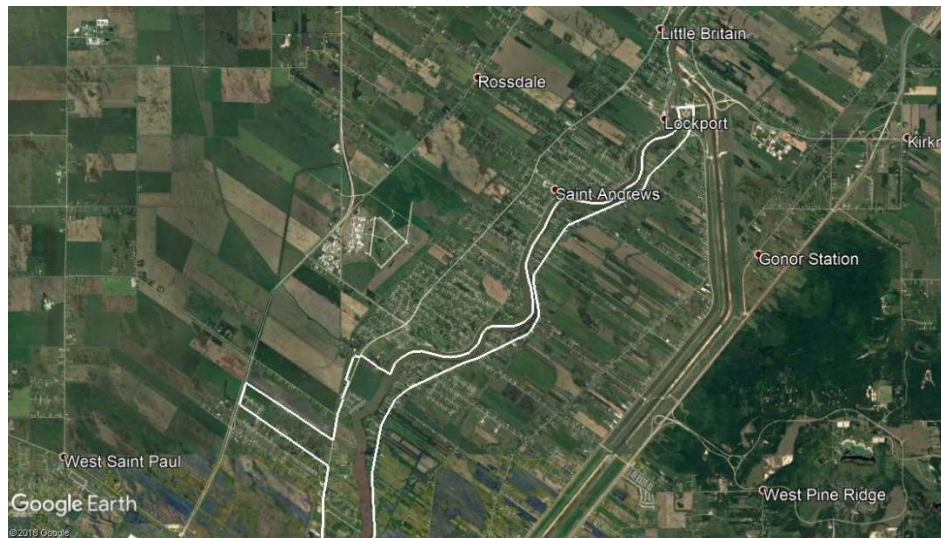
<sup>17</sup> From Statistics Canada, *Population and dwelling counts, for Canada, provinces and territories, and population centres, 2016 and 2011 censuses* –

<https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Table.cfm?Lang=Eng&T=801&S=47&O=A>

<sup>18</sup> Population centre boundaries are indicated in white, Tier 4 boundaries are indicated in red.

community and the operators seeking to serve it. The preferred solution here is to create a single Tier 5 service area covering the entire population centre, as this would facilitate participation by those operators who wish to serve just that area. This could be accomplished by moving a couple of grid cells from one Tier 4 service area to the other, to ensure the Tier 5 service area nests within a single Tier 4 service area.<sup>19</sup> A list of other cases where communities across Canada are divided by Tier 4 service area boundaries is included in Appendix A to the Joint Submission.

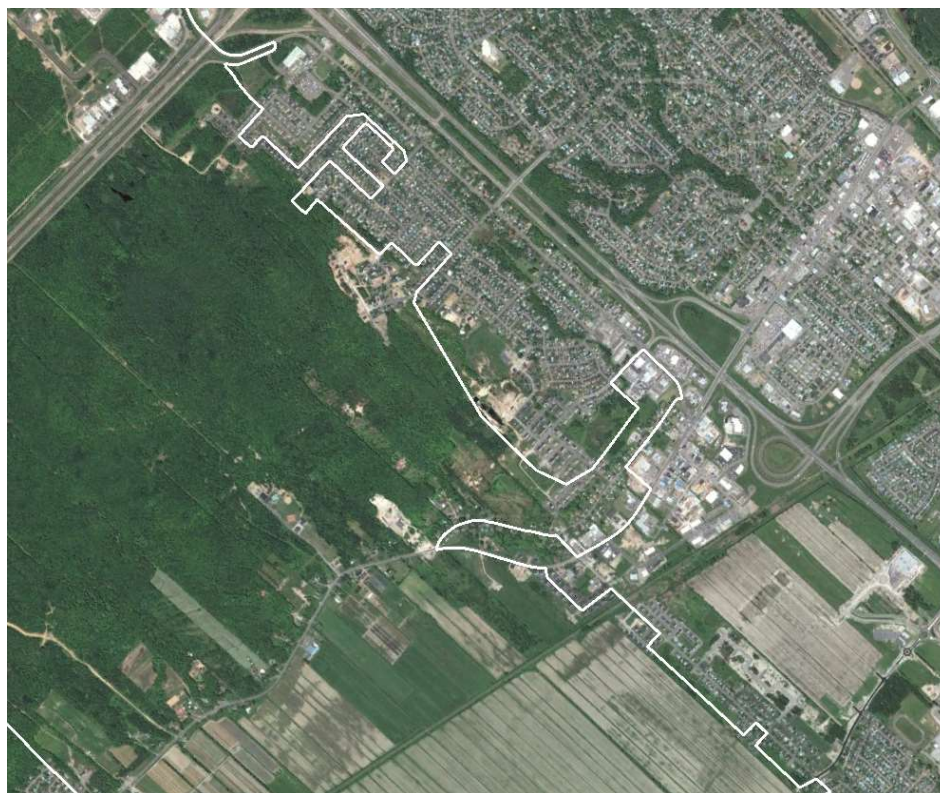
69. In addition to the issue of split communities described above, it is not clear how well Option 2 would address ISED's other design principles. Population centres may in many cases exclude adjacent neighbourhoods which are clearly part of the community covered by the Statistics Canada population centre, simply because they did not meet Statistics Canada's population density criterion. In extreme cases, dwellings on one side of a street might be included while dwellings on the other side are not. Examples of this include the area north of Winnipeg, MB, where a developed area to the east of the Saint Andrews Airport is excluded from the long extension of the Winnipeg population centre, and an F-shaped area on the western edge of the city of Trois-Rivières which is excluded from the Trois-Rivières population centre (see images below).<sup>20</sup>



Winnipeg Population Centre (part)

<sup>19</sup> Alternatively, ISED could retain a single Tier 5 service area serving the entire population centre and relax its design principle favouring strict nesting of service areas. Extremely small Tier 5 service areas, such as one represented by the portion of the Arnprior population centre falling within the 4-055 Ottawa/Outaouais area, are not likely to be practical.

<sup>20</sup> Population centre boundaries indicated in white.



Trois-Rivières Population Centre (part)

70. Further, in many cases, population centre boundaries are not particularly suitable for spectrum serving areas because they include odd shapes or narrow strips (see, for example, the extension of the Winnipeg population centre to the north of the city in the image above). This is likely due to Statistics Canada's decision for the 2016 census to extend population centres to Dissemination Blocks with density of 200 people per square kilometres.<sup>21</sup> This will cause blocks to be added as in the case of Winnipeg and blocks to be completely missed as illustrated for Trois-Rivières. Mapping the census population centre boundary to square grid cells using the grid cell centroid as the criterion<sup>22</sup> will smooth some of these anomalies but accentuate others. For example, the following figure illustrates the square grid cell mapping for the same Trois-Rivières area. We can see that the issue of the "F" is resolved but, further south, an entire neighborhood is excluded because of the centroid approach.

<sup>21</sup> See delineation rule #2 in the definition of "Population centre (POPCTR)" in Statistics Canada, *Dictionary, Census of Population 2016* –

<https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo049a-eng.cfm>

<sup>22</sup> I.e., ISSED's proposal to assign a grid cell to a service area if the centre of the grid cell falls within the Statistics Canada population centre boundary.





Trois-Rivières Population Centre (part) Mapped to Grid Cells using Centroid

71. The next example is for the town of Nicolet, Quebec with a population of 5,669. The mapping of the census population centre boundary to square grid cells using the centroid of the grid cell as the criterion would result in only two grid cells being included in the Tier 5 service area and the majority of the population centre would be excluded. Using the centroid grid cell approach is clearly unacceptable when mapping boundaries to grid cells in populated areas.

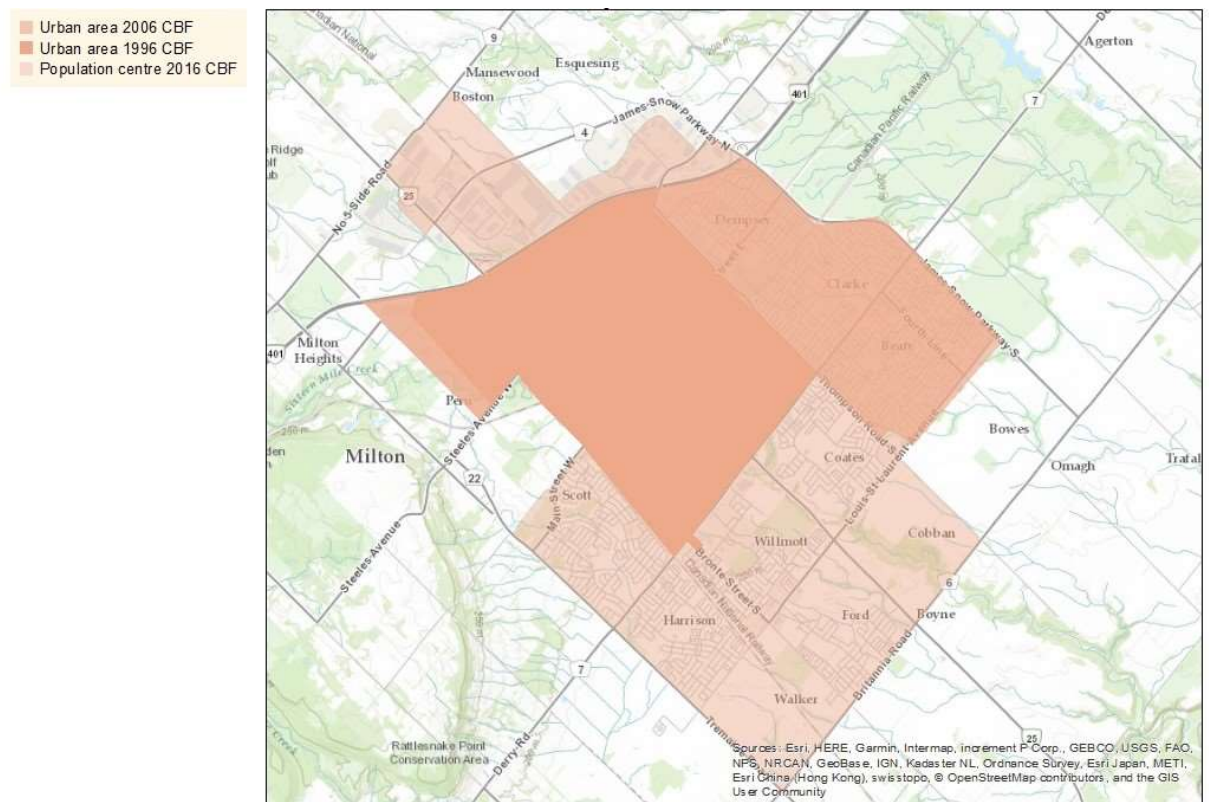


City of Nicolet, Quebec Population Centre Mapped to Grid Cell using Centroid

72. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI also note that the “other area” Tier 5 (i.e. the Tier 4 service area after the population centres have been extracted to form their own individual Tier 5 service areas) under ISED’s proposed Option 2 can be large and unwieldy. This “other” Tier 5 service area is potentially very challenging to serve. Where the population is large and dispersed or the communities of interest are very diverse, this “other” Tier 5 area may still be out of reach of smaller regional or rural operators. In other words, the creation of a single Tier 5 service area for this “other area” will not improve the availability of spectrum to smaller regional or rural operators, or promote the deployment of networks and services in rural and remote areas.
73. The “other area” Tier 5 component of ISED’s proposed Option 2 also poses particular risks in Canada’s northern territories. In Nunavut, for instance, only four of the twenty-five communities would qualify for their own Tier 5 service areas on the basis of ISED’s proposed 2,000-person cut-off: the city of Iqaluit (population 7,740 according to the 2016 Census) and the hamlets of Arviat (2,657), Rankin Inlet (2,842), and Baker Lake (2,069). All the rest of the territory would become an “other area” Tier 5 service area. One easily foreseeable result of such a division would be to permit an operator to limit service to only one or more of the larger communities and to make it uneconomic to offer service in the “other area”. Such an outcome would not offer any improvement over the current situation where an operator wishing to serve a population centre within a Tier 4

area bids for and acquires a licence for the full area and then cannot be effectively encouraged or required to offer service across the entire area once the census population centre is served.

74. In addition, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI are concerned that the urban areas which form the basis of Statistics Canada's population centres change over time. As a result, the boundaries of the population centre can shift as populations grow and shift, and Tier 5 service areas based on 2016 census population centres might no longer be appropriate in 10 or 20 years' time, if the objective is to separate urban areas from rural areas. For example, the urban areas of Milton, Ontario have expanded considerably from 1996 to 2016 as illustrated in the image below (1996 census urban area – dark red area; 2006 census urban area – mid-red area; 2016 census population centre – light red area).<sup>23</sup> The design of the boundaries for Tier 5 service areas should take this potential growth into account.



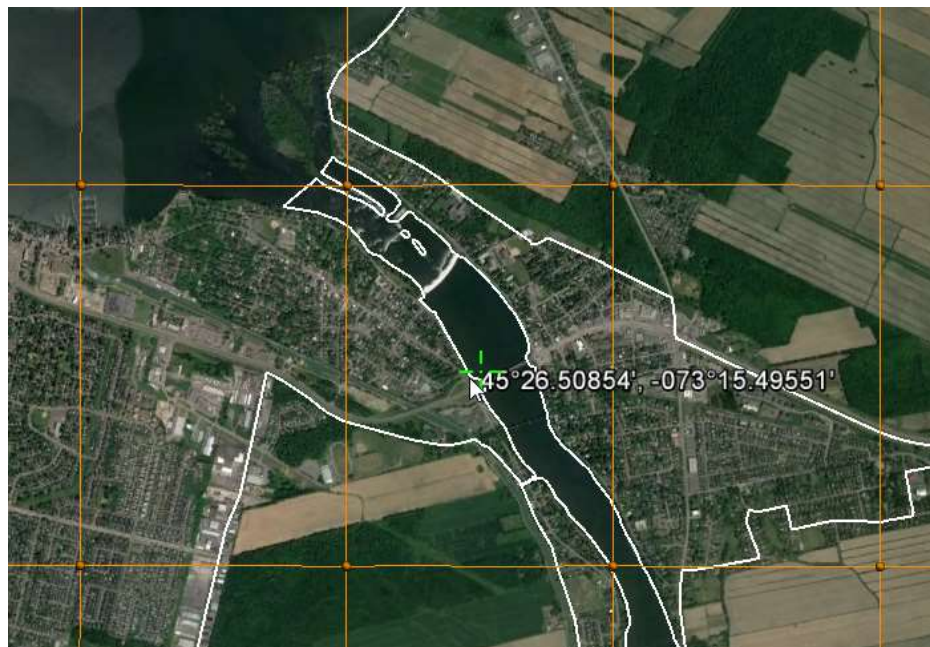
75. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI also recommend that ISED change the basis it uses for presenting Option 2. The map

<sup>23</sup> Map created using data and tools at <http://geo1.scholarsportal.info/>.



layer files that ISED provides (Consultation Document, par. 46) appear to be Statistics Canada's *cartographic* boundary files. These present the major land mass of Canada and its coastal islands. However, some bodies of water are excluded.<sup>24</sup> This can lead to issues when trying to place grid cells whose centres fall within such bodies of water. Using Statistics Canada's *digital* boundary files resolves this issue as rivers, small lakes and other bodies of water within population centres, and the grid cells whose centres fall within them, will be included.<sup>25</sup>

76. An example where this is a concern is illustrated below along the Richelieu River between the two cities of Chambly and Richelieu in Quebec, both part of the population centre of Montreal. The centroid of the grid cell at the centre of the image falls in the middle of the river. Because the cartographic boundary file excludes the Richelieu River from the population centre on either side, that grid cell would be excluded from the Tier 5 service area. Using the digital boundary files from Statistics Canada resolves this issue.



Cartographic Population Centre Boundaries along Chambly and Richelieu, Quebec

77. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider, therefore, that ISED's Option 2 addresses quite well ISED's first design principle

<sup>24</sup> See "Cartographic boundary files (CBFs)" in Statistics Canada, *Dictionary, Census of Population 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo004-eng.cfm>

<sup>25</sup> See "Digital boundary files (DBFs)" in Statistics Canada, *Dictionary, Census of Population 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo019-eng.cfm>

(recognize geographic differences) insofar as it very clearly differentiates urban from rural areas. However, Option 2 is not very effective at meeting the other design principles, and it would need to be revised extensively in order to serve as an appropriate basis for new Tier 5 service areas. In particular:

- It divides a large number of communities along Tier 4 service area boundaries.
- It results in oddly-shaped Tier 5 service areas and excludes parts of some communities from the Tier 5 which serves it when using square grid cell centroid mapping.
- The “other area” Tier 5 service area is too large for smaller regional or rural operators.
- Carving out population centres of more than 2,000 inhabitants and relegating the remaining portion of a Tier 4 service area to a new “other area” Tier 5 service area will facilitate cream-skimming in areas, such as the Northern Territories, whose populations are unevenly divided between a very small number of qualifying population centre(s) and a large number of very small, very remote locations whose populations fall well below this threshold.
- It does not adapt to growth of population centres.

## **Joint Proposal**

### **Question 4: Alternative proposals**

**ISED invites interested parties to submit alternative proposals for smaller service areas. All alternative service area proposals must be applicable to all of Canada and promote the federal government’s policy objectives.**

**Submissions should include a rationale for the proposal, an explanation of how it satisfies ISED’s policy objectives and how it meets each of the proposed design principles, and any other relevant information. One or more maps should also be included, preferably including one which covers all of Canada. Maps should be in a format that is readily accessible by ISED (e.g. in ArcGIS or MapInfo format, or publically available on the Internet with a link provided). Submissions should adhere to the requirements listed above in order to allow other stakeholders sufficient information to provide informed comments.**



78. The goal of BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI is to establish a set of well-differentiated urban and non-urban Tier 5 service areas that are of a reasonable size in terms of population and area, that are practical in terms of both administration by ISED and coordination among operators, and that make sense for the communities located within them. Such Tier 5 service areas will be an important addition to the tools available to ISED to achieve its policy objective of maximizing the economic and social benefits that Canadians derive from the use of the radio frequency spectrum.
79. Significantly, however, the characteristics of the population in Canada vary materially across the country. As the figures in the table below demonstrate, Canadians live in one of three different categories of regions, the population densities of which differ by three orders of magnitude.

<b>Categories of population density<sup>26</sup></b>	<b>Population</b>	<b>% Cdn Pop</b>	<b>Land (sq. km)</b>	<b>Land (% of Cda)</b>	<b>Density (pop / sq. km)</b>	<b>Density order of magnitude</b>
<b>Dense/Urban (&gt;5K)</b>	27,163,830	77.28%	15,104	0.168%	1798.4551	10 <sup>3</sup>
<b>Light/Rural</b>	7,946,636	22.61%	2,161,684	24.11%	3.6761	10 <sup>0</sup>
<b>Sparse/Remote unorganized</b>	41,262	0.117%	6,788,801	75.72%	0.0061	10 <sup>-3</sup>
	<b>35,151,728</b>	<b>100.00%</b>	<b>8,965,589</b>	<b>100.00%</b>	3.9207	

80. It is immediately apparent that the vast majority of Canadians (77%) live in a very limited portion of the land mass of the country (less than 1%), while most of the land mass of the country is classified as remote (76%) and contains a very small portion of the population (less than 1%). Consistent with ISED's first design principle (recognize geographic differences), the methodology used to define Tier 5 service areas must take these stark differences into account and must differentiate not just between urban and rural areas, but remote areas as well. Because of the differences between the urban, rural and remote regions of Canada, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI note that a methodology to create Tier 5 service areas which might be appropriate for one region might not be appropriate for the others.

<sup>26</sup> The Dense/Urban category is defined here as census population centres with a population greater or equal to 5,000. The Sparse/Remote Unorganized category is defined as CSDs classified by Statistics Canada as Type NO (unorganised) with a population density equal to or lesser than 0.1, as well as the CSDs in service areas 4-005 Labrador, 4-023 Matane and 4-066 Chibougamau which are greater than 1,000 square kilometres which typically have a population density of zero. Population centres within those Tier 4 service areas are not included in the Sparse/Remote Unorganized category. The Light/Rural category consists of areas which are neither urban nor remote. The figures in the table reflect Statistics Canada census geographies. Applying Tier 5 geographic boundaries may result in different figures.

## **Focus on Rural and Remote Regions**

81. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi describe below a Joint Proposal which will apply to all regions of Canada with a view to achieving the goal identified in paragraph 78 above. ISED however should focus in particular on ensuring the goal is achieved in rural and remote areas. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi, as well as other smaller regional and rural operators across the country, have demonstrated that we are willing and able to invest in networks in these areas in order to compete and to serve communities in these areas, but we face particularly high barriers to obtaining the necessary spectrum to do so. Smaller Tier 5 service areas that serve local communities well will help reduce these barriers.
82. The fundamental issue to be addressed, therefore, is to determine the optimal characteristics of a set of spectrum licence service areas, in particular their size in terms of population or land area, which would deliver the benefits sought for Canadians living in these rural and remote areas and which would increase accessibility to spectrum for smaller regional and rural service providers.
83. For example, if rural Tier 5 service areas are too large, participation in auctions by smaller regional and rural providers will be foreclosed, because the opening bid prices will be too high for those operators, or because the large service areas will include urban populations which incumbents or large regional operators will be able to acquire at higher per-MHz-pop prices than small operators could afford. However, making rural Tier 5 service areas too small increases the risk that bidders would win at auction some, but not all, of the licences they need to achieve their business plan (exposure risk), as well as the administrative burden for ISED.
84. It is therefore essential that the size of Tier 5 service areas strike an appropriate balance which allows smaller regional and rural providers to improve their access to spectrum and also does not unduly increase complexity. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi propose below an approach to defining Tier 5 service areas which achieves this balance as well as achieving ISED's policy objectives and meeting each of the proposed design principles.
85. Once the optimal characteristics of the new service areas have been determined, the next issue to address is how to decide which CSDs to group together in order to reach those optimal characteristics or, alternatively, how to divide the "other area" Tier 5 service area, if the resulting proposed Tier 5 service areas do not meet the optimal characteristics. This issue is addressed in the Joint Proposal by applying the Statistics Canada census geographies with the attributes described below.

## Overall Approach

86. As noted in the preceding sections of this Joint Submission, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider that both Options proposed by ISED in the Consultation Document contain elements that are useful to achieving ISED's policy objectives and the goal of BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi.
87. For example, Option 1 has the advantage of effectively subdividing large rural areas into smaller ones. However, it can result in spectrum service areas which combine both urban and rural areas into the same Tier 5, and these are generally not accessible to smaller regional or rural operators. Option 1 also results in a very large number of service areas of a broad range of sizes.
88. Conversely, the advantage inherent in Option 2 is its focus on a clear demarcation between urban and rural areas. However, its weaknesses include the creation of boundaries which imperfectly capture the entire urban populated area and the creation of a residual Tier 5 service area which is too large to facilitate access by smaller regional or rural operators to spectrum in that area.
89. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi support the use of Statistics Canada census geographies as the basis for spectrum service areas because they enable the compilation of statistics relating to the people living in those areas. However, many of the issues with ISED's two Options that are identified above are directly related to the attributes of those census geographies, as they were created for purposes of the census and not spectrum licensing. For example, CSDs and CDs are mapped to municipal and regional municipal boundaries created by the provinces, the characteristics of which vary greatly from province to province. This wide variety suggests that the creation of a coherent and consistent set of Tier 5 service areas across the country is unlikely if ISED only applies a simple methodology involving one type of census geography.
90. The approach proposed by BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi below will combine elements of both of ISED's proposed Options, in order to leverage the advantages of each. Further, the advantages of one of ISED's Options can offset in part the weaknesses of the other. Where they don't, the approach proposed by BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi will use a broader set of Statistics Canada census geographies in order to address the weaknesses of both of ISED's proposed Options.
91. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi also consider it important to define three categories of Tier 5 service areas consistent with the

urban, rural and remote regions of Canada. Establishing the third set of “remote” service areas will give ISED additional flexibility in the design of its licensing frameworks in order to maximize the efficient use of spectrum, to minimize hoarding of spectrum by licensees, and to increase accessibility by smaller regional or rural operators to that spectrum for the benefit of all Canadians.

92. In developing our methodology for the design of Tier 5 service areas, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi have been guided by the following high-level principles:

1. Population centres should be separated into their own Tier 5 service areas using Census Population Centres boundaries, as this provides the best distinction between urban and rural areas.
2. Population centres below 5,000 in population should remain with their surrounding rural area because servicing these small communities often implies serving the adjacent rural areas at the same time.
3. For extremely large population centres above half a million in population, the Tier 5 service area should not span more than the Census Division, and separate Tier 5 service areas should be created for any part of the population centre that spans beyond the Census Division that itself has a population of 15,000 or more.
4. The target population of rural Tier 5 service areas should be 10,000, give or take 5,000 (i.e. a target range from 5,000 to 15,000). This implies grouping adjacent rural Census Subdivisions when the population is below this range or dividing large rural Census Subdivisions when the population is above it. This target population range is the optimal range for ISED to achieve its policy objectives of increasing accessibility to spectrum and enhancing service to rural Canadians.
5. In northern remote areas, Tier 5 service areas should be based on Census Division boundaries, and Census Population Centres or small Census Subdivisions should not be separated into distinct Tier 5 service areas.
6. The square grid cell centre can be used to define boundaries for rural and remote Tier 5 service areas, as these boundaries are in low population areas. However, where the Tier 5 service area boundary is near a population centre, any grid cell that overlaps the Census Population Centre should be included inside the Tier 5 service area boundary.
7. Tier 5 service areas should generally nest within existing Tier 4 service areas but, in those cases where Tier 4 service area boundaries bisect a

population centre, preserving the territorial integrity of the population centre must take precedence over strict application of the “nesting” rule.

## Detailed Methodology

93. In order to create Tier 5 service areas that recognize the geographic differences of different areas in the country, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI propose that ISED apply a three-step methodology.
1. First, remote Tier 5 service areas would be defined based primarily on Statistics Canada’s Type NO (unorganised) CSDs.
  2. Second, similar to ISED’s Option 2, urban Tier 5 service areas would be defined using Statistics Canada’s population centres (however, at a different population threshold as explained below).
  3. Third, rural Tier 5 service areas would be based on groupings of the remaining CSDs influenced by ISED’s Option 1.
94. The details of each step are set out below.

### Remote Tier 5 Service Areas

95. The first step would be to create remote Tier 5 service areas, based principally on CSDs that Statistics Canada has classified as Type NO (unorganised) with population densities equal to or less than 0.1 persons per square kilometre.
96. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI also propose that the CSDs within service areas 4-005 Labrador, 4-023 Matane and 4-066 Chibougamau whose surface areas exceed 1,000 square kilometres and whose population densities are zero (i.e., less than 0.1), should form the basis of remote Tier 5 service areas. While they are not classified as Type NO (they are Type SNO (subdivision of unorganised) in Labrador and Type MÉ (municipalité) in Chibougamau or Anticosti), they are effectively “remote” and very similar to the Type NO CSDs with population densities at or below 0.1.
97. In the northern Tier 4 service areas of 4-005 Labrador, 4-066 Chibougamau, 4-170 Yukon, 4-171 Nunavut, and 4-172 Northwest Territories, which consist primarily of Type NO CSDs whose population densities are equal to or below 0.1, remote Tier 5 service areas would be defined using the boundaries of the CDs within each Tier 4 service area (in other words, incorporating any census population centres in those CDs). The communities within these CDs are typically very small and the larger ones which qualify as census population centres play an essential role in supporting the economy of the region. A Tier 5 service area based on a remote CD without those populated areas (i.e. if they formed a separate Tier 5 service area) would not be commercially viable. This

would not meet ISED's second design principle (foster demand), and the development of the area would be put at significant risk given the limited market incentive to serve it.

98. For the remaining remote CSDs (typically in the southern areas of the country), BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi propose that all such CSDs within the same Tier 4 service area be combined into a single Tier 5 service area if the combined area is less than 75,000 square kilometres. If the combined area is more than 75,000 square kilometres, the CSDs would form individual Tier 5 service areas and be combined with other CSDs sharing the same Census Consolidated Subdivision (CCS) which do not otherwise qualify as a population centre Tier 5 service area. These CSDs are located closer to more densely populated areas of the country, which means they are less central to the economic development of the region and combining them would foster demand for the resulting Tier 5 service area.
99. Note that the CD or CSD boundaries, as applicable, would be converted to Tier 5 service area boundaries using the "centroid grid cell rule," where those grid cells whose centres fall within the CD or CSD are assigned to the Tier 5 service area.
100. For clarity, Type NO CSDs with population densities greater than 0.1 persons per square kilometre would not form the basis of remote Tier 5 service areas. These CSDs typically include major roads and some population along those roads, and are more appropriately the basis for rural Tier 5 service areas. Other Type SNO and MÉ CSDs across the country would also not qualify as remote, as their population densities would be equal to or greater than 0.1 persons per square kilometre and would similarly be more appropriately the basis for rural Tier 5 service areas.
101. Creating a set of remote Tier 5 service areas would be consistent with ISED's design principles. In particular, it would clearly satisfy the first principle (recognize the geographic differences of those types of areas). It would also satisfy the second principle as, even though there might not be a population base, there would be another economic value (such as resource extraction) to support commercial viability in those areas.
102. Further, creating remote Tier 5 service areas separate from urban and rural Tier 5 service areas would give ISED the flexibility to determine whether a different assignment method might be more effective in those areas at achieving its policy objectives in any given case. For example, while an auction might be the appropriate method of assigning a given spectrum band in urban Tier 5 service areas, a first-come first-served (FCFS) or site licensing approach might be more effective in remote areas at ensuring spectrum resources are put to productive use.

103. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi would emphasize, however, that the efficient allocation of spectrum will be greatly facilitated if licensing frameworks include strong obligations to subordinate spectrum upon request, as discussed in further detail in the last section of this Joint Submission. Where these obligations apply, ISED would have more flexibility in the design of Tier 5 service areas while still achieving its policy objectives listed in paragraph 26 of the Consultation Document.

#### Urban Tier 5 Service Areas

104. As noted above, the second step of the Joint Proposal is to create the urban Tier 5 service areas. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi propose that these be based upon Statistics Canada's census population centres. Like ISED's Option 2, the strength of this approach is to clearly differentiate urban from non-urban areas. This satisfies in particular ISED's first design principle (recognizing geographic differences).
105. Unlike in Option 2, though, grid cells which overlap any portion of the population centre would be assigned to the Tier 5 service area (the "all grid cell rule"), instead of only those grid cells whose centres fall within the population centre (the "centroid grid cell rule"). This "all grid cell rule" would expand slightly the resulting service area compared to ISED's centre-based approach. However, consistent with the first design principle, it would also include within the Tier 5 service area more of the urbanised areas that happen to fall outside of the population centre as a result of Statistics Canada's population density criterion but which are clearly associated with the adjacent urban community (see the earlier discussion on this issue). As an exception, a grid cell would be assigned to a population centre based on the grid cell centroid if it overlaps two or more population centres.
106. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi agree with ISED's proposal of three categories of population centres based on size (Consultation Document, par. 48) where these are located outside of remote areas. However, the population base for small population centres should be 5,000 to 29,999 people (instead of 2,000 to 29,999). In our view, population centres of 2,000 to 5,000 people typically have small geographic areas and it would be difficult to serve the urban area separately from the immediately adjacent suburban and rural areas. In these situations, it is more practical to keep the adjacent areas in a single Tier 5 service area. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider that this 5,000-person threshold is more in line with the first and fourth design principles than the 2,000-person threshold.

107. In some cases, a population centre is situated within a CSD which is not much larger than the population centre itself. After the population centre is converted into its own Tier 5 service area, the remainder of the CSD would form a narrow peripheral ring around the urban Tier 5 service area. This would be impractical as a spectrum service area and would likely not best serve the needs of the community, contrary to the design principle proposed by BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI. To address this issue, the peripheral CSD is merged into the urban Tier 5 if the surface area of the periphery is less than 30 square kilometres. This approach would avoid fractioning CSDs into service areas that are impractical and would provide an additional area around the population centre to accommodate population growth within the urban Tier 5 service area. Peripheral ADAs are also merged into the urban Tier 5 if the surface area of the periphery is less than 30 square kilometres.
108. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI also propose that very large population centres which span multiple cities be subdivided. Where a Statistics Canada population centre has more than 500,000 people and spans multiple CDs, and where the population centre's population in the fringe CDs is greater than 15,000, the urban Tier 5 should be divided along the boundaries of the CDs. The 500,000-person threshold would ensure only the largest population centres are subdivided. The 15,000 population criterion subdivides very large population centres along provincial or municipal boundaries (e.g. the Ottawa–Gatineau population centre would be divided into separate Tier 5 service areas for the cities of Ottawa and Gatineau), but does not subdivide very large population centres that have simply overgrown their CD (e.g. Winnipeg). The large population centres that are divided in this way along CD boundaries are Quebec, Montreal, Ottawa, Toronto and Hamilton.

#### Rural Tier 5 Service Areas

109. After urban and remote Tier 5 service areas are defined, all remaining areas of the country would be considered rural Tier 5 service areas. However, unlike in Option 2, the remainder of the Tier 4 service area (after the population centres have been removed to form Tier 5 service areas) would not form a single "other area" Tier 5 service area (Consultation Document, par. 50). As noted earlier, this "other area" would be very challenging to serve, and might not actually improve the availability of spectrum to smaller regional or rural operators, or promote the deployment of networks and services in rural and remote areas as many of them would still be too large.
110. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI propose that the "other area" in each Tier 4 service area be subdivided instead into rural Tier 5 service areas using the boundaries of groups of CSDs, ADAs, or CCSs as described below.



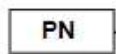
111. It is first important to understand the characteristics of the other census geographies. A Census Consolidated Subdivision (CCS) is a group of adjacent CSDs within the same CD and was defined by Statistics Canada to aggregate agricultural areas into units to report agricultural statistics. Larger CSDs (land area greater than 20 square kilometres or population of 100,000 or more) can form their own CCS.<sup>27</sup> A benefit of using CCS to define Tier 5 service areas is that it provides clear indication of how to merge very small CSDs.
112. An Aggregate Dissemination Area (ADA) is a geographic area which has, where possible, a population between 5,000 and 15,000 based on the previous census population counts and was initially defined through consultation by Statistics Canada. ADAs are created by aggregating existing Dissemination Areas (DA) which themselves are formed of groups of Dissemination Blocks (DBs). DBs are the basis of all CSDs and of census population centres, and respect provincial, territorial, CD, census metropolitan area (CMA) and census agglomeration (CA) with CT boundaries.<sup>28</sup> The relationship between the various Statistics Canada census geographies is shown in the chart below.<sup>29</sup>

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<sup>27</sup> See “Census Consolidated Subdivision (CCS)” in Statistics Canada, *Dictionary, Census of Population 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo007-eng.cfm>

<sup>28</sup> See “Aggregate Dissemination Area (ADA)” in Statistics Canada, *Dictionary, Census of Population: 2016* – <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo053-eng.cfm>

<sup>29</sup> Statistics Canada, *Hierarchy of standard geographic areas for dissemination, 2016 census*, available at – <https://geosuite.statcan.gc.ca/geosuite/en/index#self>



114. Although CDs were initially the basis for Tier 4 service areas, there are many exceptions and there are CSDs that span Tier 4 service areas such as the CSD of Chatham-Kent or that of Halifax. The internal ADA boundaries of these large CSDs actually map to the existing Tier 4 service areas. Using ADAs in the design

rules for new rural Tier 5 services areas is therefore an essential component to facilitate the nesting of Tier 5 service areas into existing Tier 4 service areas.

115. Using CCSs or ADAs to subdivide the “other area” results in a set of reasonably coherent and consistent rural Tier 5 service areas while limiting the total number of Tier 5 service areas to a manageable number, by merging CSDs that are impractically small and by aiming to create service areas with a population between 5,000 and 15,000. In addition, because they respect provincial, territorial and CD boundaries, they will result in Tier 5 service areas which generally nest within Tier 4 service areas.
116. The methodology of the Joint Proposal applies three aggregation rules to rural CSDs. First, when an ADA encompasses more than one CCS, a Tier 5 service area is created through the union of all the CSDs within these CCSs. This ensures that the population is within the target range for these service areas.
117. Second, a Tier 5 service area is created for each remaining CCS that has either:  
a) a single ADA for the entire CCS or b) a remaining population under 20,000 (i.e. subtracting the population of Tier 5 service areas obtained from population centres within the CCS) or c) a remaining land area under 1,000 square kilometres. The first two constraints ensure for these service areas that the population is within the target range while the last avoids creating rural service areas that are too small in geographic area.
118. Third, the remaining ADAs are formed into Tier 5 service areas by merging small ADAs that nest geographically within a larger one. This results in some Tier 5 service areas that are geographically small in area but these typically correspond to densely-populated communities which did not qualify themselves as Tier-5 service areas by virtue of being census population centers.
119. Note that the CSD, CCS or ADA boundaries would be converted to Tier 5 service area boundaries using the centroid grid cell rule as the boundary will generally be in low populated areas.

## **Output of Methodology**

120. The Joint Proposal results in 370 urban, 867 rural and 61 remote Tier 5 service areas for a total of 1,298. This falls between the up to 5,162 Tier 5 service areas created by ISED’s Option 1 using CSDs and the 863 Tier 5 service areas created by ISED’s Option 2 using population centres.

Category	Number of Tier 5 areas	Total			Average		
		Population	Dwellings	Sq. km	Population	Dwellings	Sq. km
<b>Population centre</b>	370	27,263,266	11,576,032	18,059	73,685	31,287	49
<b>Rural</b>	867	7,511,133	3,666,018	2,571,273	8,663	4,228	2,966
<b>Remote</b>	61	377,329	170,393	6,376,256	6,186	2,793	104,529

121. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi are submitting with this Joint Proposal an Excel spreadsheet attached as Appendix E listing the Tier 5 service areas along with their population and dwelling counts. A KMZ file containing the maps themselves is also being submitted as Appendix D for review by ISED and respondents to the Consultation Document.
122. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi invite other respondents to the Consultation Document to contact our representative, Marc Carrier, at [marc.carrier@cogeco.com](mailto:marc.carrier@cogeco.com) or 514-764-4600 ext. 4360, if they would like to suggest improvements that are in line with the additional principles stated in this Joint Submission or if they would like to add their support to the Joint Proposal. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi will provide updated maps in its reply comments.

### Consistent with Design Principles

123. In the Consultation Document, ISED proposed a number of design principles to guide the creation of a new set of service areas:
- *Recognize geographic differences: consider the unique characteristics of urban and rural areas in Canada*
  - *Foster demand: areas should have either a population base or some economic value to support commercial viability*
  - *Maintain technological and competitive neutrality: not favouring or discriminating against one technology or group of stakeholders over another*
  - *Ensure boundaries are in low population areas to minimize potential interference issues.*
  - *Ensure areas nest within the existing Tier 4 service areas to maintain continuity with ISED's existing licensing structure.*
  - *Use the ISED's existing grid cells as constituent building blocks (Consultation Document, par. 36).*
124. As noted earlier, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi endorse these principles with minor variations, but submit that two additional principles are required if ISED is to achieve its policy objectives:

- *Favor design rules which result in service areas that will be adapted to the reality of their environment.*
  - *Ensure the boundaries serve the needs of local communities.*
125. The Joint Proposal meets all eight design principles. It is specifically designed to reflect in detail the unique characteristics of urban, rural and remote areas in Canada by creating Tier 5 service areas tailored to each of them. Each Tier 5 service area created by the Joint Proposal is designed to have either a population base or an economic value that would support the commercial viability of the spectrum licence area. The Joint Proposal also supports technological and competitive neutrality, as the Tier 5 service areas are based on the characteristics of the population distribution and land mass in question, and not on the potential uses for or users of spectrum in those areas.
126. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that, to the greatest extent possible, the boundaries of the Tier 5 service areas created by the Joint Proposal are located in lower population areas. Indeed, a key step in the Joint Proposal methodology is to create the more densely populated urban Tier 5 service areas and to place the boundary further out from the population centres through the “all grid cell rule”. Where boundaries run through populated areas, they do so because of the application of other design rules.
127. The Joint Proposal is consistent with the design principles that the Tier 5 service areas “nest” within existing Tier 4 service areas and that existing grid cells be used as constituent building blocks. Where a proposed Tier 5 service area might be bisected by a Tier 4 boundary because of the location of the underlying population centre (see Appendix A), BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi recommend that the Tier 4 boundary be shifted by a grid cell or two to correct this issue.
128. The Joint Proposal also favours reasonably-sized service areas which are adapted to the reality of their environment. Through the use of CDs, CCSs and ADAs, the size of the Tier 5 service areas is reasonably coherent and consistent across the country, while reflecting the significant differences among urban, rural and remote areas.
129. Finally, but most importantly, the boundaries of the Tier 5 service areas created by the Joint Proposal are designed to best serve the communities in the service areas. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider it important not to lose sight of the fact that the creation of new service areas is only a means to an end, namely, the effective and efficient use of spectrum resources to support network deployment and the provision of services

to Canadians in all parts of Canada. For example, by slightly shifting Tier 4 service area boundaries where necessary<sup>30</sup> or by applying the all grid cell rule to slightly expand the population centres to avoid excluding parts of the communities covered by the Tier 5 service area, the Joint Proposal is intended to facilitate the provision of wireless services to Canadians in those communities.

## **Supports ISED Policy Objectives**

130. ISED's stated policy objectives for this consultation are to:

- *Improve access to spectrum, furthering more efficient usage across Canada*
- *Address the unique geographical distribution of Canada's population, allowing for greater flexibility in the design of licensing frameworks*
- *Better address new and different services, technologies, applications and use cases* (Consultation Document, par. 26)

131. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi believe that our Joint Proposal for creating a set of Tier 5 service areas will be more effective than either of the two Options proposed in the Consultation Document in enabling ISED to satisfy those objectives.

132. The Joint Proposal does so by creating service areas which closely reflect the geographic distribution of Canada's population. It combines the clear demarcation between Canada's urban and rural areas of Option 2 with the consistent division of rural territories of Option 1, while improving the consistency and coherence of that division by applying other census geographies in addition to CSDs and CDs. It also creates a new set of remote service areas not included in either Option 1 or 2 which reflects the unique characteristics of three-quarters of the land mass of Canada.

133. The Tier 5 service areas created by the Joint Proposal will help improve access by smaller regional and rural operators to spectrum resources, as those operators will more easily be able to acquire only that spectrum which is necessary for their businesses cases. In addition, large urban operators will be able to focus on spectrum in urban markets, which means smaller regional and rural operators will no longer need to compete with them for spectrum in rural and remote areas and risk being shut out of the market by operators with little

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<sup>30</sup> I.e., the urban Tier 5 service areas created by the Joint Proposal based on the 24 population centres listed in Appendix A with populations greater than 5,000 and bisected by Tier 4 boundaries. The preferred option is for ISED to shift the Tier 4 service area boundary to ensure the entire Tier 5 service area falls within the same Tier 4. However, ISED could choose to relax the application of the "nesting" design principle.

interest in serving that market. The distribution of spectrum resources will therefore be more closely aligned with the interest and ability of operators to use them, which will increase the efficiency of spectrum use in Canada and the efficacy of the deployment of networks and services to Canadian consumers and businesses.

134. The creation of three sets of Tier 5 service areas reflecting the division of the Canadian territory into urban, rural and remote regions, instead of the two sets proposed by the Consultation Document, will also provide ISED with greater flexibility in the design of licensing frameworks for different bands. ISED will be able to adapt, following consultation, for any given spectrum band and any given type of service area, the assignment method that most effectively transfers those spectrum resources into the hands of operators best able and willing to use them. The clear demarcation between the three types of Tier 5 service areas means that, where it is appropriate to do so, ISED will be able to adopt different assignment methods in different areas.
135. However, as BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI have noted earlier, irrespective of the methodology chosen by ISED, the creation of Tier 5 service areas will not be sufficient, by itself, to achieve ISED's policy objectives. The last section of this Joint Submission will review some of the other policy measures which will be required.

## **Review of Other Jurisdictions**

136. The issue of developing licensing policies to support the development of new technologies and the extension of services into unserved and underserved areas is not unique to Canada. As ISED notes, other countries are beginning to use smaller licensed service areas as tools to accomplish their policy objectives:

*Globally, countries including the United States, France, the United Kingdom, and Sweden are starting to use smaller service areas in certain bands as a licensing tool to actively support the development and adoption of 5G technologies and associated spectrum bands that harness the localized nature of millimetre wavelengths. As a natural extension, smaller service areas will result in the availability of more licences, particularly in rural areas.*

(Consultation Document, par. 15)

137. Work done by regulators in these other countries demonstrate that spectrum, including mid-band spectrum, can be assigned using a reasonable number of smaller licence service areas than have previously been used. ISED can select

from among the best ideas from these other jurisdictions around the world and adapt them to the needs of Canadian consumers, business and operators.

## United States

138. In the United States, for example, the Federal Communications Commission (FCC) adopted the Spectrum Access System (SAS) enabling the spectrum in the CBRS Band (150 MHz between 3550 MHz and 3700 MHz) to eventually be managed or assigned on a dynamic (or pseudo dynamic) basis across three tiers of access:

- Tier 1 is incumbent users such as the federal government (Department of Defense, US Naval Radars) and fixed satellite users.
- Tier 2 is Priority Access License (PAL) users – licensed wireless users who acquire spectrum through an auction. PAL users must protect incumbent Tier 1 users from harmful interference. FCC is planning to allow up to 70 MHz of contiguous CBRS spectrum to be licensed at the PAL level, including a spectrum aggregation limit of 40 MHz per PAL licensee.
- Tier 3 is General Authorized Access (GAA) users who will deploy “lightly-licensed” devices. GAA users must protect both Tier 1 incumbents and Tier 2 PAL users from harmful interference. This would leave between 80 and 150 MHz of CBRS spectrum available at the GAA level.

139. In its *Report and Order* from October 23rd, 2018,<sup>31</sup> the FCC adopted “counties” as the geographic licence area for PAL licensing. This represented a compromise between the census tracts the FCC originally proposed in 2015<sup>32</sup> and the Partial Economic Areas (PEAs) requested by the CTIA and T-Mobile in 2017, as there are approximately 3,200 counties, 74,000 census tracts and 416 PEAs. The FCC noted in particular in the 2018 *Report and Order*:

*... increasing the PAL license area slightly from census tracts to counties strikes a more appropriate balance and will more effectively support next generation mobile network deployments,*

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<sup>31</sup> *In the Matter of Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report and Order, FCC 18-149, adopted 23 October 2018 – <https://docs.fcc.gov/public/attachments/FCC-18-149A1.pdf>

<sup>32</sup> *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) – <https://docs.fcc.gov/public/attachments/FCC-15-47A1.pdf>



*while still retaining the ability to support small, targeted uses, included fixed uses. (par. 20)*

*... we find that counties will service the needs of rural communities and will allow new and innovative services to reach underserved and unserved communities, consistent with the Act's objectives. (par. 27)*

*Counties are sufficiently small to support the small cell deployments and localized types of service we anticipate will be an important part of this band. They are also small enough to allow licensees to target their deployments where they need capacity. At the same time, as the Commission and commenters have recognized, counties are the basic "building blocks" of many geographic areas, making them suitable for aggregation for licensees that wish to operate over larger areas. This flexibility makes counties an appropriate middle ground for this band, given that the characteristics of 3.5 GHz band spectrum are favorable to support both localized and wide-area deployments, and thus to entities wanting to provide a variety of innovative services—some more targeted than others—to the public. (par. 29)*

140. In other words, the FCC was specifically concerned to identify a spectrum licence service area that would be flexible enough to accommodate a wide variety of uses, users and technologies, and that would promote the deployment of services to rural areas. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI submit that addressing similar concerns in Canada support the number and size of Tier 5 service areas proposed in the Joint Proposal.<sup>33</sup>

## **Australia**

141. The Australian Communications and Media Authority (ACMA) licences spectrum by frequency blocks in specified geographic areas when authorized to do so by a spectrum reallocation declaration published by the Minister responsible for Communications. ACMA has noted that it favours an area-wide licensing approach over site-licensing arrangements where it expects demand to exceed supply and where there is interest in deploying dense wide-area networks. In other areas, site-based apparatus licences are considered suitable:

*The existing site-based apparatus licence arrangements in the 3.6 GHz band support use of the band by a number of different*

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<sup>33</sup> The auction of CBRs PAL licenses has not yet taken place in the US and auction dates are anticipated to be made public in the second half of 2019.

*services and licensees. Such arrangements are optimal when demand for access to spectrum does not exceed its supply. They allow any prospective operator to apply for licences in specific areas where spectrum is available. This allows spectrum to be assigned as required rather than as part of an area-based licence where services may not be deployed across the whole area or where there are no plans to roll out services in certain areas for some time.*

*Site-based apparatus licence arrangements are not considered optimal if demand for access to spectrum exceeds its supply and there is strong interest in deploying dense wide-area networks. ...<sup>34</sup>*

142. The Australian regulator consults with stakeholders on the definition of the geographic areas appropriate for each set of spectrum licences. In 2000, for example, ACMA's predecessor, the Australian Communications Authority, determined, following a consultative process and a spectrum re-allocation declaration from the relevant Minister, to make the 3.4 GHz band<sup>35</sup> available in 19 geographic areas corresponding to 14 major cities and towns and 5 larger "regions".<sup>36</sup> Of particular note is that these geographic licence areas are located in the southern and eastern edges of the country where most of the population resides. A significant portion of the land mass of the country, corresponding to the less-densely populated northwest, was excluded even though it includes population centres<sup>37</sup> (see map below).

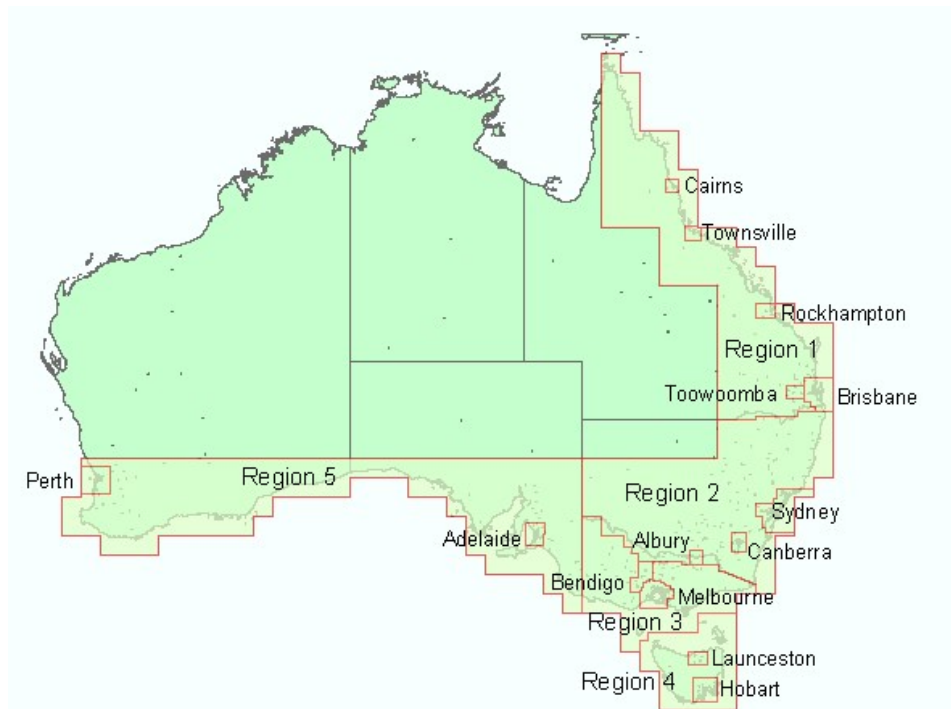
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<sup>34</sup> ACMA, *Future Use of the 3.6 GHz Band – Options Paper*, June 2017, pages 17-18, available at – <https://www.acma.gov.au/theACMA/future-approach-to-the-3-6-ghz-band> .

<sup>35</sup> 3425 – 3475 MHz, 3475 – 4392.5 MHz and 3542,5 – 3575 MHz.

<sup>36</sup> Australian Communications Authority, *Radiocommunications Spectrum Marketing Plan (3.4 GHz Bands) 2000*, 17 July 2000, Schedule 1.

<sup>37</sup> For example, Darwin.



Australian 3.4 GHz licence areas in 2000<sup>38</sup>

143. This same geographic division of the country was reprised for ACMA's auction of residual 3.4 GHz licences during the December 2017 multi-band residual lots auction.<sup>39</sup>
144. ACMA adopted a similar approach for the 3.6 GHz band<sup>40</sup> in 2018. Prior to 2018, use of this band was authorised via site-based apparatus licences for fixed point-to-point links, C-band fixed satellite services and, after 2008, broadband wireless access services in regional and remote areas. ACMA noted, however, that the band was considered under WRC-15 agenda 1.1, resulting in the 3600 – 3700 MHz band being identified for international mobile telecommunications (IMT) in a number of countries. ACMA further noted that the 3.6 GHz band also

<sup>38</sup> Map of 3.4 GHz licence areas from ACMA, *Draft spectrum reallocation recommendation for the 3.6 GHz band – Metropolitan and regional areas of Australia*, October 2017, page 32, available at – <https://www.acma.gov.au/theACMA/spectrum-reallocation-for-the-3-6-ghz-band>

<sup>39</sup> This auction included a 3.4 GHz spectrum lots which had not been sold in 2000 as well as lots not renewed in 2015 when the original 3.4 GHz licences expired. The auction also included residual lots in the 1800 MHz, 2 GHz, and 2.3 GHz bands. See <https://www.acma.gov.au/Industry/Spectrum/Spectrum-projects/Multi-band-auction>

<sup>40</sup> 3575 – 3700 MHz.

forms a subset of the 3300 – 3800 MHz band, which is being touted internationally since 2016 as a pioneer band for 5G services.<sup>41</sup>

145. In light of this, ACMA conducted a series of consultations<sup>42</sup> and, in May 2018, combined the technical frameworks of the 3.4 GHz and the 3.6 GHz bands into one, noting that the bands are directly adjacent to each other and considered substitutable.<sup>43</sup>
146. ACMA had originally proposed to use 6 extended metropolitan licence areas (i.e. larger than those used for the 3.4 GHz band) and a single regional licence area covering the rest of the south and eastern portions of the country for this band.<sup>44</sup> Industry submissions, however, opposed this proposal on the grounds that alignment with the boundaries used for the 3.4 GHz band would facilitate future spectrum trading and defragmentation of the entire 3.4 – 3.8 GHz band. Other stakeholders “*recommended disaggregation of the single regional Australia lot, to enable smaller companies to purchase spectrum in targeted areas of interest.*”<sup>45</sup> In response to these submissions, ACMA subsequently adopted a configuration consisting of 6 metropolitan licence areas (aligned with the equivalent 3.4 GHz band metropolitan areas) and 8 regional areas (instead of one larger regional area), and auctioned the 3.6 GHz band in November and December 2018 using 5 MHz unpaired blocks in those 14 geographic areas.<sup>46</sup>
147. It is worth noting that, as in the case of the 3.4 GHz band, while the 3.6 GHz licence geographic areas cover the vast majority of the Australian population, a significant portion of the territory in the centre and northwest of the country is excluded from the auction (the grey area in the map below). ACMA continues to apply a site-based apparatus licensing regime in that remote area.

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<sup>41</sup> ACMA, *Draft allocation instruments for 3.6 GHz band (3575–3700 MHz) metropolitan and regional lots auction - Consultation paper* – May 2018, page 5, available at – [https://www.acma.gov.au/theACMA/3\\_6-ghz-band-legislative-instruments-consultation](https://www.acma.gov.au/theACMA/3_6-ghz-band-legislative-instruments-consultation).

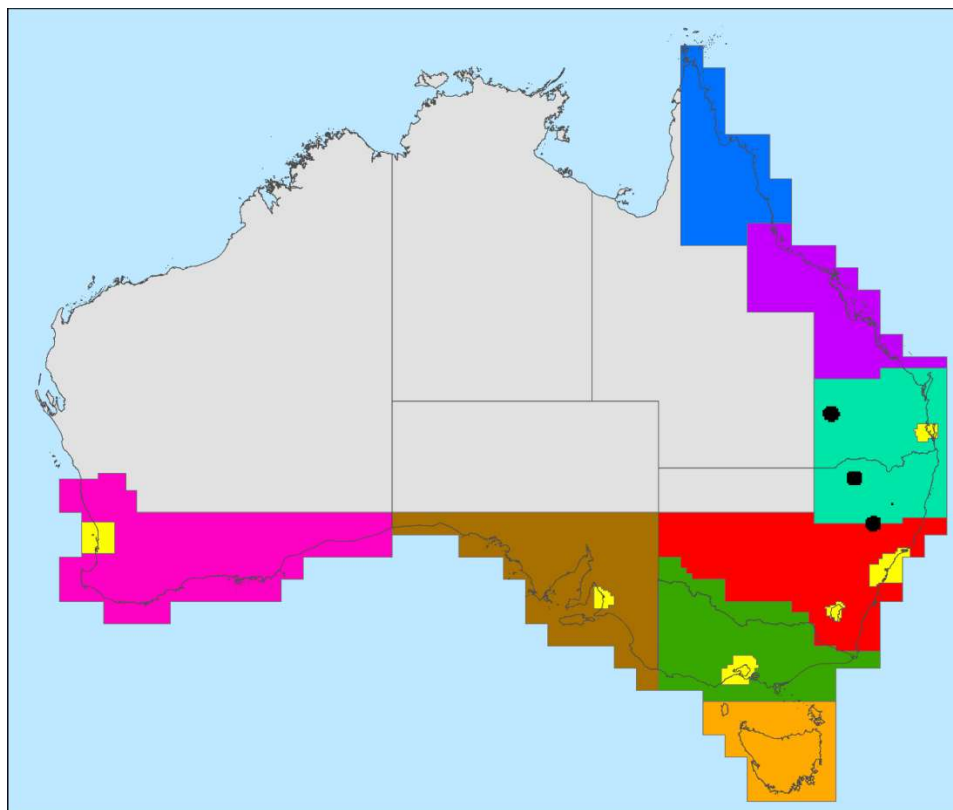
<sup>42</sup> *Ibid*, page 6.

<sup>43</sup> ACMA, *3.4 GHz and 3.6 GHz band spectrum licence technical framework – Consultation paper*, May 2018, page 9, available at – [https://www.acma.gov.au/theACMA/3\\_6-ghz-band-legislative-instruments-consultation](https://www.acma.gov.au/theACMA/3_6-ghz-band-legislative-instruments-consultation).

<sup>44</sup> ACMA, *Draft spectrum reallocation recommendation for the 3.6 GHz band – Metropolitan and regional areas of Australia*, October 2017, page 35, available at – <https://www.acma.gov.au/theACMA/spectrum-reallocation-for-the-3-6-ghz-band>

<sup>45</sup> ACMA, *Draft allocation instruments for 3.6 GHz band (3575–3700 MHz) metropolitan and regional lots auction – Consultation paper*, May 2018, page 19, available at – [https://www.acma.gov.au/theACMA/3\\_6-ghz-band-legislative-instruments-consultation](https://www.acma.gov.au/theACMA/3_6-ghz-band-legislative-instruments-consultation).

<sup>46</sup> *Ibid*, page 23,



Australian 3.6 GHz licence areas in 2018<sup>47</sup>

KEY:			
Black	Excised areas	Moree, NSW	Quirindi, NSW
		Roma, QLD	Uralla, NSW
Yellow	Metro areas	Adelaide	Melbourne
		Brisbane	Sydney
		Canberra	Perth
Blue	Regional areas	North Queensland	
Purple		Central Queensland	
Turquoise		Regional Northern NSW/Southern Queensland	
Red		Regional Southern/Western NSW	
Green		Regional Victoria	
Orange		Tasmania	
Brown		Regional South Australia	
Pink		Regional Western Australia	

<sup>47</sup> Map and key derived from ACMA, *3.6 GHz band auction, November 2018 – Auction guide*, August 2018, page 20, available at – <https://www.acma.gov.au/theACMA/applicant-information-package-3-6-ghz-band-auction>

148. The term of the 3.6 GHz licences auctioned in 2018 was set to expire at the same time as the 3.4 GHz licences auctioned in 2000 (and renewed in 2015) and auctioned in 2017.
149. ACMA, therefore, adopted a spectrum licence area model for the 3.4 and 3.6 GHz bands that would separate urban from rural areas, in recognition of the different demand characteristics for those areas, as well as facilitate access to spectrum by smaller operators in rural areas. Area licensing was not applied in remote, sparsely-populated regions of the country, where a site-based licensing approach would be more effective at facilitating service providers. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI recommend that ISED take similar considerations into account when determining its Tier 5 licence area model and licensing frameworks. In particular, ISED's Tier 5 service area model should recognize the distinctive nature of Canada's urban, rural and remote areas, not only the differences between urban and rural regions.

## **Ireland**

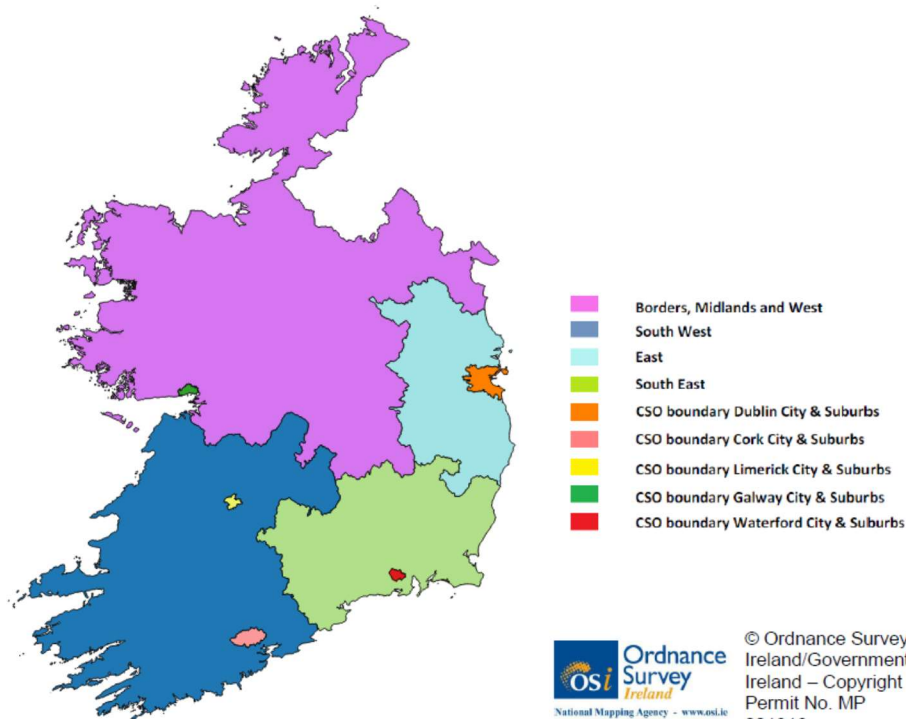
150. In 2017, the Commission for Communications Regulation (ComReg) in Ireland auctioned spectrum in the 3.6 GHz band<sup>48</sup> in nine geographic areas.<sup>49</sup> These areas are the five Cities and their Suburbs, and four Regions composed of various Counties (but excluding the areas of the five Cities and Suburbs). Boundaries for the Cities and Counties are defined by law while the boundaries of the Suburbs are defined by the Central Statistics Office based on the density of occupied dwellings in proximity to the legal City boundaries.<sup>50</sup> Given the potential for the 3.6 GHz band to be used for fixed wireless access, the Regions were also designed to align with the equivalent regions of the National Broadband Plan.

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<sup>48</sup> 3410 – 3800 MHz.

<sup>49</sup> Other spectrum bands, such as the 800, 900 and 1800 MHz bands appear to have been awarded on a national basis.

<sup>50</sup> See *Census 2011 – Population Classified by Area*, Appendix 1, page 152, available at – [https://www.cso.ie/en/media/csoie/census/documents/census2011vol1andprofile1/Volume1\\_Appendices.pdf](https://www.cso.ie/en/media/csoie/census/documents/census2011vol1andprofile1/Volume1_Appendices.pdf)



3.6 GHz Licence Areas in Ireland<sup>51</sup>

151. In coming to this decision, ComReg considered the different uses of the spectrum that might occur in urban versus rural areas, the impact on the complexity of the auction and the desirability of giving operators the flexibility to acquire only the spectrum they require. In particular, ComReg considered the possibility of issuing national licences but chose not to do so.

4.63 *Considering this and taking into account the responses to Document 14/101, it seems that interested parties may wish to obtain national licences or regional licences containing either, urban and rural locations or just rural locations.*

4.64 *Accordingly, it would seem appropriate and prudent for the award to allow flexibility and scalability for different types of operators to compete for the appropriate geographic footprint suited to their business case, be it national or regional.*

<sup>51</sup> Map and key derived from *Response to Consultation and Decision on Proposed 3.6 GHz Band Spectrum Award*, ComReg Document 16/57, published on 11 July 2016, page 76, available at – <https://www.comreg.ie/publication/response-to-consultation-decision-on-proposed-3-6-ghz-band-spectrum-award/>



4.65 *If ComReg was to offer national licences in the 3.6 GHz band exclusively it seems that this might create the possibility of spectrum being less than optimally assigned. ...*

...

4.114 *In that regard, ComReg notes that there may be smaller operators who may wish to obtain licences to operate solely in certain regions of the State (e.g. rural areas). There may, equally, be other operators wishing to acquire spectrum rights in this band in more densely populated areas, such as the cities. Indeed, there may also be many variations of the footprints that operators may adopt including a full national presence.<sup>52</sup>*

152. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi submit that, while the scale of the country and number of licence areas are different, similar considerations apply here in Canada. The boundaries of the urban and rural spectrum licence areas should be designed to facilitate participation by smaller operators and to provide operators with the flexibility to acquire rural or urban licences depending on their specific requirements.

## **Policies for Canada**

153. In response to the issue of supporting the development of new technologies and the extension of services into unserved and underserved areas, regulators in other jurisdictions have designed spectrum licence service areas:
- which are flexible enough to accommodate a wide variety of uses, users and technologies, and to promote the deployment of service to rural areas;
  - which differentiate between urban, rural and remote areas in line with the different demand expected for spectrum in these areas, and facilitate access to spectrum to operators in these areas; and
  - whose boundaries are designed to allow for flexibility and scalability so that different types of operators can compete for the appropriate geographic footprint.

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<sup>52</sup> *Consultation on Proposed 3.6 GHz Band Spectrum Award*, ComReg Document 15/70, published 10 July 2015, pages 76-77 and 88 (footnotes omitted), available at – <https://www.comreg.ie/csv/downloads/ComReg1570.pdf>.



154. These issues and solutions are also relevant to the situation in this country and BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi have reflected them in the Joint Proposal. By adopting the Joint Proposal, ISED would be aligning its policies with the best ideas from around the world.

## **Additional Measures Necessary to Achieve Policy Objectives**

155. The overriding objective of BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi is to ensure that spectrum resources are assigned to operators willing and able to use them to provide services to Canadians, particularly those living and working in rural and remote areas of the country. We welcome therefore ISED's statement regarding:

*... its long-term commitment to encourage affordable telecom services to help bridge the digital divide, foster inclusivity, and support an innovative economy. ISED will continue to develop policies that encourage service to rural areas to ensure that all Canadians benefit from high-quality services, ubiquitous coverage, and affordable prices.*

(Consultation Document, par. 11)

156. However, while the creation of new, smaller service areas will facilitate this, it will not be sufficient in the absence of other supporting policy measures by ISED. Simply put, smaller service areas make possible a more flexible and effective assignment of spectrum across the country, but they do not prevent operators from attempting to hoard spectrum and they do not ensure the same licensing framework is suitable for all bands in all places. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that, given the scope of its question Q3C in this consultation, ISED appears to be already aware of this.

157. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi therefore urge ISED, when it issues a decision on new service areas following this consultation, to commit to supporting a broader:

*... focus on the scope of licences, pricing, and effective use of allocated spectrum, including ensuring that small providers, non-*

*profit providers, and non-incumbent providers have reasonable access to spectrum for broadband deployment.*<sup>53</sup>

158. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI anticipate that ISED will address these matters when it consults on licensing frameworks for individual bands. However, we are strongly of the view that these measures must be considered and implemented.

### **Spectrum Set-Aside**

159. Spectrum set-asides continue to be necessary. While smaller service areas facilitate a more granular assignment of spectrum licences, they do not prevent large incumbents from overbidding small or non-incumbent providers and thereby excluding them from the market. Setting aside a portion of a band for smaller regional or rural operators or for new entrants, continues to be a necessary and appropriate policy measure to promote deployment of and competition between networks.

### **Stronger Subordination Obligations**

160. ISED must also consider strengthened conditions of licence, such as an obligation to provide other carriers with reasonable and timely access to spectrum subordination agreements upon request. If a small operator is willing and able to serve a rural or remote area that a large operator has not prioritized or is not prepared to serve, and requests subordination of the spectrum licence of the larger operator, the onus should be on the licence holder to show why the licence should not be subordinated. It would not be in the public interest to allow the licence holder to refuse subordination without justification and to continue to hold on to the spectrum in question.
161. The FCC has acknowledged this by incorporating the principle of “use it or share it” into the design of its CBRS Band spectrum licensing arrangements. While incumbent users may have priority over PAL users, who in turn may have priority over GAA users, spectrum that is not being used must be made available to all users. No licensee in any tier can prevent others from accessing spectrum that is not being used.
162. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI are not advocating here for or against the adoption of a similar Spectrum Access System

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<sup>53</sup> Canada, Parliament, House of Commons, Standing Committee on Industry, Science and Technology, *Broadband Connectivity in Rural Canada: Overcoming the Digital Divide*, 11th report, 42nd Parliament, 1st session (17 April 2018) (Dan Ruimy M.P., chair), Recommendation 6, page 23-24.

here in Canada. However, we strongly urge ISED to adopt the principle of “use it or share it” and to design its licensing frameworks accordingly.

163. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that ISED currently has a framework in RP-019 – albeit dating from 1998 – for the transfer of spectrum to persons willing and able to use licensed spectrum that is otherwise fallow. This policy addresses the rights, interests and legitimate expectations of licensees, as well as the interests of third parties in accessing spectrum for the deployment of networks and services. However, the scope of policy RP-019 is limited to the cellular band and to spectrum transfers, rather than other instruments such as subordination of licences.
164. We also note that ISED subsequently developed policy DGSO 003-13, the “Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licences for Commercial Mobile Spectrum”. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi strongly recommend that ISED review, update, and extend that policy framework beyond “commercial mobile spectrum.” The policy could be improved by establishing more formal timelines and procedures for licensees to respond to subordination requests and commit ISED to their timely evaluation. These arrangements, subject to timely and active supervision and approval by ISED, would enable the Department to harness market forces to ensure that spectrum is effectively and efficiently used across the country.

### **Alternative Assignment Methods**

165. In the event a licence has not been sold at auction, even at the reserve price, ISED should consider making the spectrum in that area available on a non-auction basis. For example, it might be made available on a first-come, first-served basis, or licensed on a station-by-station basis. This would facilitate the provision of service to Canadians living in the area, even though the licence was not deemed sufficiently attractive by auction participants.

### **Alternative Auction Formats**

166. ISED should consider the use of auction formats that facilitate participation by small or non-incumbent entities, for example, the use of SMRA instead of CCA auction formats. Operators who are able and willing to use spectrum to provide services to Canadians should not be prevented from doing so due to barriers raised by the auction process itself.
167. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note, for example, comments filed by Eastlink in October 2017:

*Eastlink reiterates our comments under previous auctions that the CCA format generally discriminates against smaller, regional service providers as the package bidding and winner determination features inherently favour larger national service providers. We submit that the SMRA format is more appropriate for Canada where regional service providers are critical to sustainable competition, particularly in rural areas, and where such providers may value regional licences more than large national service providers. CCA allows large national providers to include regional licences they may not need or particularly value in their larger bids at a fraction of the cost that a regional provider would pay for the licence, due to the CCA's predisposition to favour larger packages rather than maximizing the value for each licence included in the package. In fact, the CCA format encourages national bidders to do so in order to increase the size of their package to ensure they secure the licences they actually value.<sup>54</sup>*

168. This issue can be illustrated as follows. A regional Bidder A may be interested in serving only a smaller licence serving area, such as 4-031 Trois-Rivières with a 2016 population of 265,152. Under CCA rules, however, Bidder A is unlikely to prevail over a larger Bidder B who bids on package of multiple licence areas, for example both 4-031 Trois-Rivières and 4-051 Montréal (2016 population: 4,352,037), as the value of the bid on the combined package will almost always exceed the value of the bid on the separate smaller licence area combined with the ISED reserve bid.<sup>55</sup> Bidder A would prevail only if there was a third Bidder C who was interested only in 4-051 Montréal and the combined values of Bidder A's bid on 4-031 Trois-Rivières and of Bidder C's bid on 4-051 Montréal exceed the value of Bidder B's bid on the combined areas of 4-031 Trois-Rivières and 4-051 Montréal. This is unlikely to occur and becomes more unlikely as Bidder B adds licence serving areas to its packages (bidding, for example, on a package of 4-030 Québec, 4-031 Trois-Rivières and 4-051 Montréal in competition with Bidder A's bid on 4-031 Trois-Rivières alone). Bidder A could also prevail if

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<sup>54</sup> Bragg Communications Inc. carrying on business as Eastlink, Comments filed on 2 October 2017 in ISED *Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band*, SLPB-005-17, 19 August 2017, par. 57.

<sup>55</sup> BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that this is not an issue exclusive to Canada. Ofcom in the UK has noted "... individual providers with localised spectrum demand are unlikely to be able to bid successfully against operators who value a national licence (or would pay a high price for a national licence relative to their expected revenues)." Ofcom, *Award of the 700 MHz and 3.6 – 3.8 GHz spectrum band: Consultation*, Annex 5, par. A5.26, published 18 December 2018, available at – [https://www.ofcom.org.uk/data/assets/pdf\\_file/0019/130726/Award-of-the-700-MHz-and-3.6-3.8-GHz-spectrum-bands.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0019/130726/Award-of-the-700-MHz-and-3.6-3.8-GHz-spectrum-bands.pdf). Ofcom's proposed solution to the local licensing issue appears to be "to create a process for new, local licences for third parties who wish to exploit unused mobile spectrum" but the details of this solution have not yet been published. See par. A5.61 in the same document.

Bidder B also submitted in supplementary round a 2<sup>nd</sup> bid for 4-051 Montréal only, but this too is unlikely to occur.

169. The creation of new, smaller Tier 5 service areas will make it easier for rural and regional operators to choose only the spectrum licences they need for their specific business plans. However, these new service areas will not, by themselves, fully solve the problem of barriers to access to spectrum by smaller regional and rural operators created by the auction format itself.

## **Spectrum Use Requirements**

170. Finally, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSI encourage ISED to consider deployment requirements for Tier 5 service areas which require actual commercial use of the spectrum being deployed, and not merely the installation of a few transmitters to cover an area nominally. The policy objective in the Spectrum Policy Framework for Canada “*to maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum resource*” can only be achieved if the spectrum is being used to provide commercial services to Canadians.
171. This approach of requiring of licensees more than nominal coverage is not novel. Where it does not impose a specific construction requirement, for example, the FCC imposes on licenses of many spectrum bands a deployment requirement of “substantial service” within the licence term. In the case of PAL users in the 3.5 GHz band, the FCC requires:

*... Priority Access Licensees to provide a bona fide communications service that meets a “substantial service” standard of performance, and we adopt two specific safe harbors to meet this standard, one for mobile or point-to-multipoint services and a second for point-to-point services.*<sup>56</sup>

172. “Substantial service” is defined as “*service which is sound, favorable and substantially above a level of mediocre service which just might minimally warrant renewal.*”<sup>57</sup> Failure by a licensee to meet this requirement results in forfeiture of the licence.<sup>58</sup>

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<sup>56</sup> *In the Matter of Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report and Order, FCC 18-149, 23 October 2018, paragraph 60, available at – <https://docs.fcc.gov/public/attachments/FCC-18-149A1.pdf>

<sup>57</sup> 47 CFR § 27.14(a).

<sup>58</sup> In the case of PAL users, the FCC specifically declined to allow delinquent licensees to retain a partial licence for the areas they are actually serving. See *In the Matter of Promoting Investment in the 3550-*

173. The FCC’s two “safe harbors” provide guidance to licensees on the construction requirements they must meet but allow them the flexibility to satisfy the “substantial service” obligation in other ways. However, it should be noted that the safe harbor for mobile service requires a PAL licensee to demonstrate that “*it provides reliable signal coverage and offers service over at least 50 percent of the population in the license area*” (emphasis added). Where the FCC has not established a safe harbor for a PAL service, for example low power IoT-type services, it requires a licensee to demonstrate that it “provided a bona fide communications service, either for unaffiliated customers or for private, internal use, that meets the standard of substantial service”<sup>59</sup> (emphasis added). Similarly, specific construction requirements imposed by the FCC on other bands generally require licensees to demonstrate that they “... *provide signal coverage and offer service ...*” (emphasis added).<sup>60</sup>
174. In other words, it is not sufficient that these licensees demonstrate compliance by providing mere coverage: they must also demonstrate that they are offering a service. By adopting similar requirements in its licensing frameworks, and by improving the effectiveness of the policy framework and process in DSGO-003-13 as suggested above, ISED can better ensure spectrum in Canada is put to productive use and will maximize the economic and social benefits to Canadians in all parts of the country.

## **Conclusion**

175. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi commend ISED for this initiative to establish a new set of smaller service areas for competitive spectrum licensing. Smaller service areas are a much-needed tool to help ensure spectrum is used as efficiently as possible in order to maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum resource.
176. The goal of BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi is to establish a set of well-differentiated urban and non-urban Tier 5 service areas that are of a reasonable size in terms of population and area, that are practical in terms of both administration by ISED and coordination among operators, and that make sense for the communities located within them. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi propose therefore that ISED adopt

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3700 MHz Band, GN Docket No. 17-258, Report and Order, FCC 18-149, 23 October 2018, paragraph 73.

<sup>59</sup> *Ibid*, par. 69.

<sup>60</sup> 47 CFR § 27.14.

their Joint Proposal for the design of Tier 5 service areas, instead of either Option 1 or Option 2.

177. The Joint Proposal recognizes the existence in Canada of very different urban, rural and remote areas, and applies a three-step process to define service areas in each. Remote Tier 5 service areas are based on unorganised CSDs with population densities of 0.1 persons per square kilometre or less. Urban Tier 5 service areas are based on Statistics Canada's population centres larger than 5,000 persons, with the largest population centres subdivided along CD boundaries. Rural Tier 5 service areas would be based on CSDs, CCSs or ADAs to create a reasonable number of service areas across the country.
178. In the event ISED does not adopt the Joint Proposal, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi note that ISED's Option 1 with certain critical modifications would most closely resemble the Joint Proposal. Urban CSDs would need to be combined to no more than the level of CDs (ensuring secondary core CSDs remain separate Tier 5 service areas), rural CSDs would need to be divided along ADA boundaries or combined by CCSs (whichever results in fewer Tier 5 service areas in a given Tier 4 service area) and remote areas of the country would need to be considered separately from rural areas. However, even with these modifications, Option 1 would not satisfactorily address the need to clearly distinguish urban from rural areas, or as a result adequately meet ISED's first design principle. For this reason, BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi consider the Joint Proposal to be more effective than either Option, and consider the modified Option 1 to be a second-best solution.
179. BCBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel and SSi also emphasize that this initiative is a necessary and critical first step to ensuring the efficient use of spectrum in Canada. It is, however, not sufficient by itself to achieve this objective. Additional licensing and policy measures, such as spectrum set-asides, strong subordination requirements, alternative assignment methods and auction formats, and effective spectrum use obligations, will also be required.



## Appendix A

### Population Centres Bisected by Tier 4 Boundaries

PCUID	Population Centre	Population 2016	Intersected Tiers	Intersected Tiers	Intersected Tiers
0002	Acton Vale	5399	4-044 Drummondville	4-047 Granby	
0005	Alençon	1562	4-049 Sorel	4-050 Joliette	
0008	Alliston	18809	4-078 Alliston	4-094 Barrie	
0021	Arnprior	10426	4-055 Ottawa	4-057 Arnprior/Renfrew	
0022	Arthur	2333	4-079 Guelph/Kitchener	4-080 Fergus	4-081 Kincardine
0031	Ayr	4171	4-079 Guelph/Kitchener	4-086 London/Woodstock/St. Thomas	
0063	Beloeil	50845	4-048 St-Hyacinthe	4-051 Montreal	
0089	Bradford	29862	4-077 Toronto	4-078 Alliston	
0115	Calgary	1237656	4-134 High River	4-136 Calgary	
0119	Campbell River	35138	4-156 Courtenay	4-157 Powell River	
0122	Campbellton	10716	4-022 Campbellton	4-023 Matane	
0125	Canmore	11764	4-134 High River	4-136 Calgary	
0167	Chatham	43550	4-089 Chatham	4-091 Wallaceburg	
0177	Chilliwack	73161	4-152 Vancouver	4-153 Hope	
0198	Collingwood	20102	4-081 Kincardine	4-094 Barrie	
0201	Contrecoeur	6236	4-049 Sorel	4-050 Joliette	
0209	Crabtree	3004	4-050 Joliette	4-051 Montreal	
0214	Dalhousie	2351	4-022 Campbellton	4-023 Matane	
0244	Dundalk	2046	4-078 Alliston	4-081 Kincardine	
0262	Enderby	2964	4-151 Kelowna	4-162 Salmon Arm	
0265	Erin	2647	4-077 Toronto	4-079 Guelph/Kitchener	
0267	Espanola	3693	4-099 Elliot Lake	4-100 Sudbury	
0346	Hagersville	2939	4-085 Haldimand/Dunnville	4-086 London/Woodstock/St. Thomas	4-087 Brantford
0353	Hantsport	1560	4-009 Bridgewater/Kentville	4-010 Halifax	
0447	Ladysmith	10637	4-154 Victoria	4-155 Nanaimo	
0478	Lloydminster	31400	4-127 Battleford	4-129 Lloydminster	
0480	London	383437	4-086 London/Woodstock/St. Thomas	4-093 Strathroy	
0489	Lucknow	1121	4-081 Kincardine	4-082 Listowel/Goderich	
0516	Mattawa	1786	4-059 Notre-Dame-du- Nord	4-097 North Bay	
0564	Notre-Dame-du- Bon-Conseil	1018	4-040 Victoriaville	4-044 Drummondville	

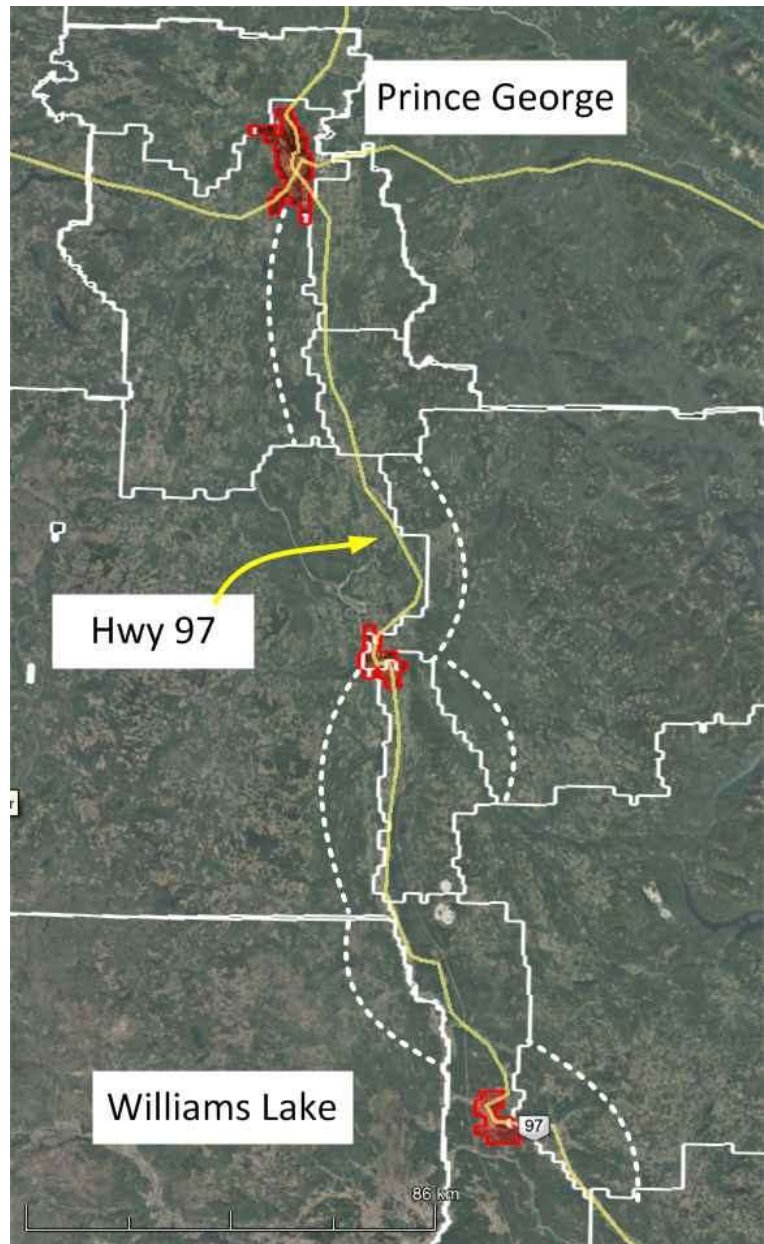
PCUID	Population Centre	Population 2016	Intersected Tiers	Intersected Tiers	Intersected Tiers
0572	Neepawa	3939	4-114 Brandon	4-116 Dauphin	
0580	New Richmond	1901	4-019 Miramichi/Bathurst	4-023 Matane	
0609	Orangeville	30734	4-077 Toronto	4-078 Alliston	
0661	Port Hawkesbury	3004	4-013 Antigonish/New Glasgow	4-014 Sydney	
0697	Redwater	1591	4-141 Edmonton	4-143 Bonnyville	
0770	Sorel	36088	4-049 Sorel	4-050 Joliette	
0811	Saint-Césaire	3815	4-046 Farnham	4-051 Montreal	
0846	Saint-Joseph-de- Lanoraie	2576	4-049 Sorel	4-050 Joliette	
0863	Saint-Sauveur-des- Monts	7849	4-051 Montreal	4-052 Sainte-Agathe- des-Monts	
0874	Sainte-Adèle	5786	4-051 Montreal	4-052 Sainte-Agathe- des-Monts	
0908	Sutton	7531	4-077 Toronto	4-094 Barrie	
0920	Témiscaming	1361	4-059 Notre-Dame-du- Nord	4-097 North Bay	
0938	Tilbury	4768	4-089 Chatham	4-090 Windsor/Leamington	
0968	Valcourt	1806	4-042 Sherbrooke	4-044 Drummondville	
0987	Victoriaville	44735	4-035 Plessisville	4-040 Victoriaville	
1017	Wheatley	2868	4-089 Chatham	4-090 Windsor/Leamington	
1034	Wingham	2934	4-081 Kincardine	4-082 Listowel/Goderich	
1061	Fermont	2288	4-005 Labrador	4-064 Baie-Comeau	
1067	Keswick - Elmhurst Beach	26757	4-077 Toronto	4-078 Alliston	4-094 Barrie
1133	Niverville	4083	4-110 Steinbach	4-111 Winnipeg	
1217	Lions Bay	1334	4-152 Vancouver	4-158 Squamish/Whistler	
1314	Cultus Lake	1053	4-152 Vancouver	4-153 Hope	
1330	Everett	1670	4-078 Alliston	4-094 Barrie	
1338	Betsiamites	2105	4-024 Mont-Joli	4-064 Baie-Comeau	
1469	Maria	1124	4-019 Miramichi/Bathurst	4-023 Matane	
1485	Saint-Jean-Baptiste	1703	4-048 St-Hyacinthe	4-051 Montreal	
1487	Saint-Michel-de- Bellechasse	1146	4-029 Montmagny	4-030 Quebec	
1515	Long Sault	1779	4-067 Cornwall	4-068 Brockville	
1520	Oro Station - Hawkestone	1691	4-077 Toronto	4-094 Barrie	
1529	Wendover	1785	4-053 Hawkesbury	4-055 Ottawa	
1547	Heritage Pointe	2075	4-134 High River	4-136 Calgary	
1566	Rosedale	1741	4-152 Vancouver	4-153 Hope	

## Appendix B

### CSD Boundaries that Ignore Local Conditions

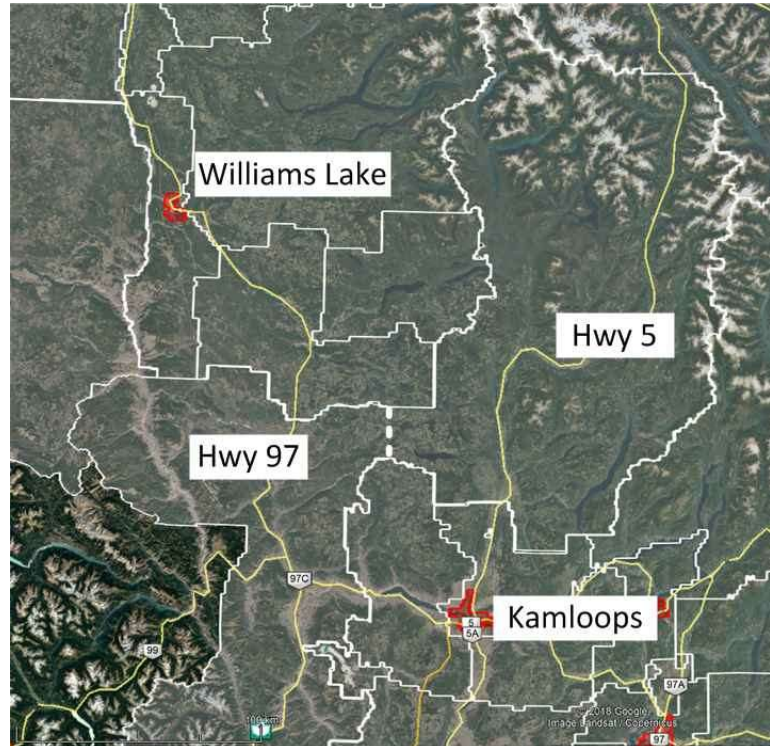
#### Highway 97 corridor, Central BC

Statistics Canada CSD, ADA and CCS boundaries all follow the middle of the Fraser River from Prince George to Gang Ranch south of Williams Lake. The map to the right shows the CSD boundaries with solid white lines. Appropriate boundaries, in low population areas along ridgetop, are shown with dotted white lines.



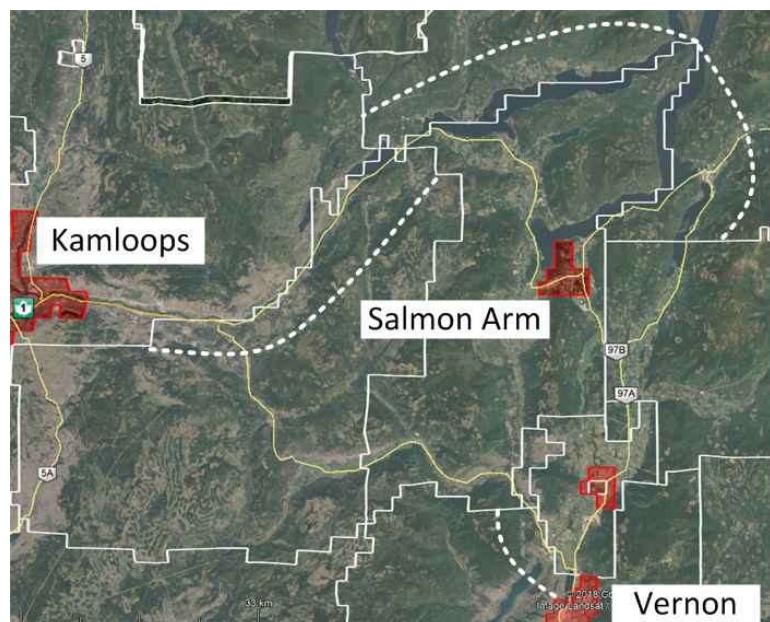
### North of Kamloops, BC

A single large Statistics Canada CSD encompasses two distinct service areas, one in the Bonaparte River Valley along Highway 97, and another in the North Thompson River Valley along Highway 5 (shown with solid white lines). These two regions should be separated, as shown in the dotted white line.



### Shuswap Lake and surrounding area, BC

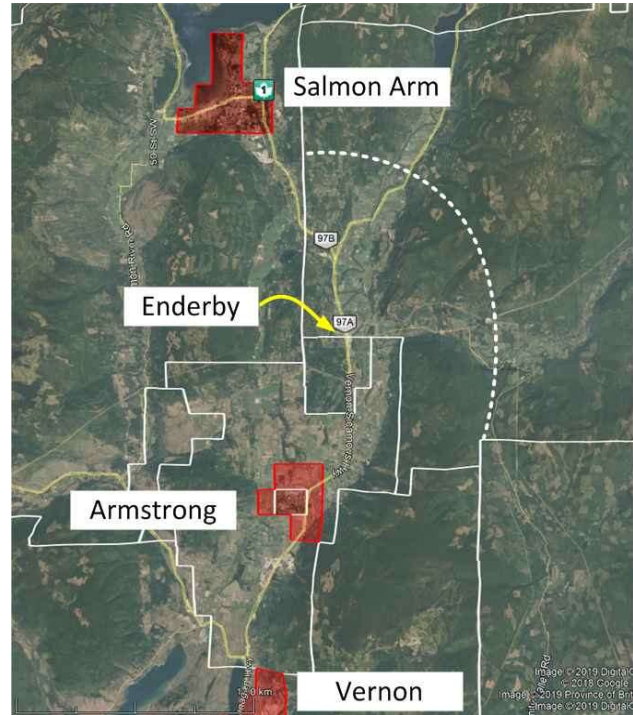
The Statistics Canada CSD boundaries in the region between Kamloops, Vernon, and Salmon Arm follow the lakes and valley bottoms, shown with solid white lines. Appropriate boundaries, in low population areas along ridgetop, are shown with dotted white lines.





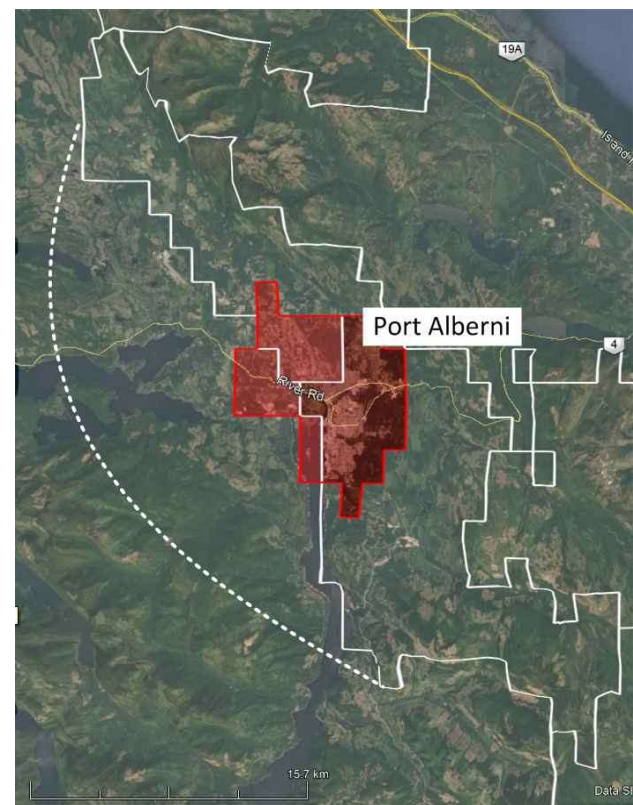
## Enderby, BC

The small community of Enderby is split by the CSD boundaries (white lines) and by the Tier-4 service area boundaries, and is separated from the ridgetop transmission sites that serve the community. The boundary should be shifted to encompass the transmission site and the entire community, in order to better serve the population.



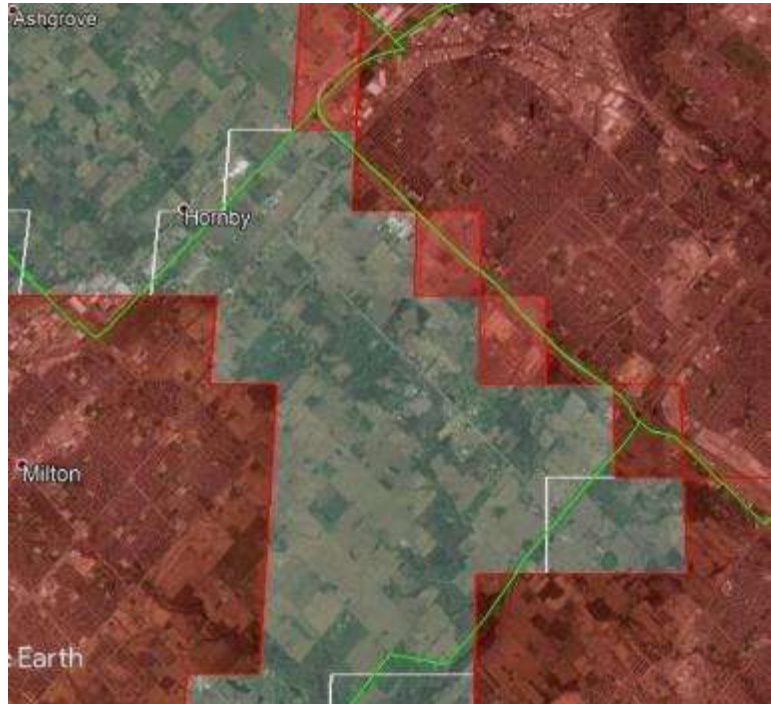
## Port Alberni, BC

The CSD boundary in the Port Alberni area runs through the settled area at the bottom of the Stamp River Valley (solid white lines). The boundary should be moved to the ridgetop on the other side of the valley (dotted white line).



### Milton, Mississauga and Oakville, ON

The CSD, ADA and CCS boundaries (in green) between Milton and Mississauga follow Highway 403. Shifting the boundary slightly to the southwest would allow the Tier 5 boundary to call within less densely populated areas.



Similarly, the CSD and CCS boundary east of Oakville along the Lake Ontario shore should be shifted slightly eastward to fall within an industrial area.

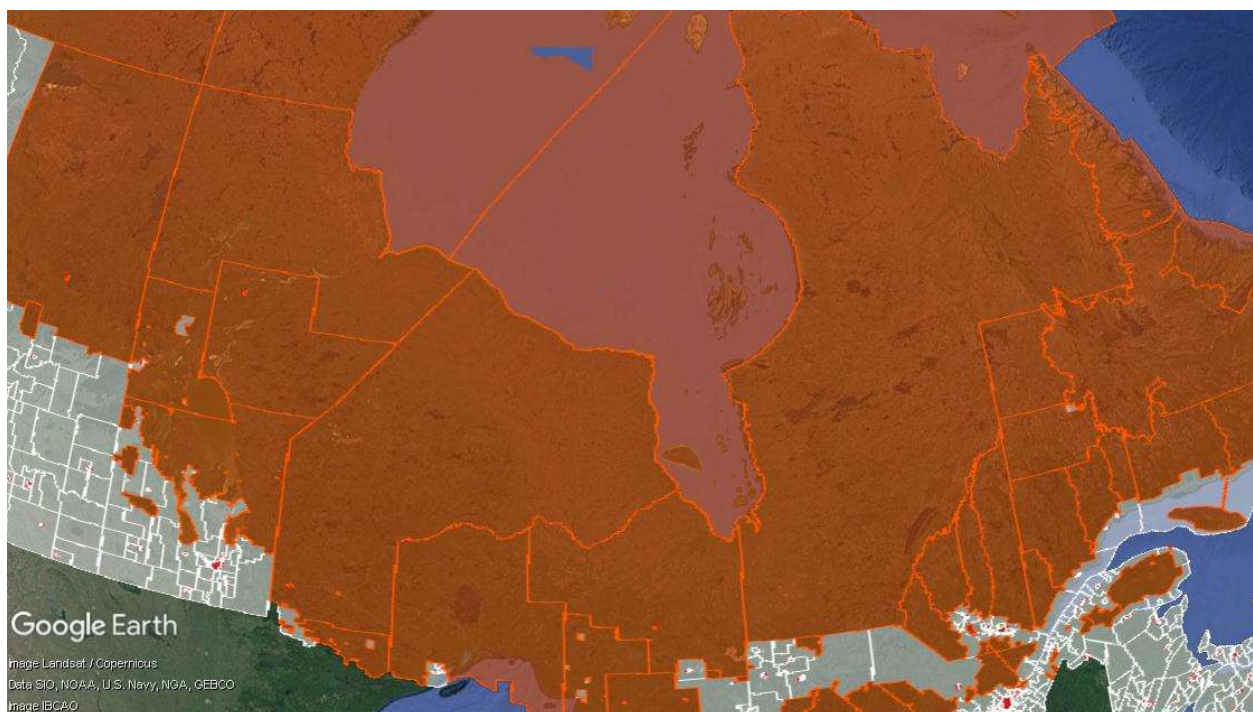




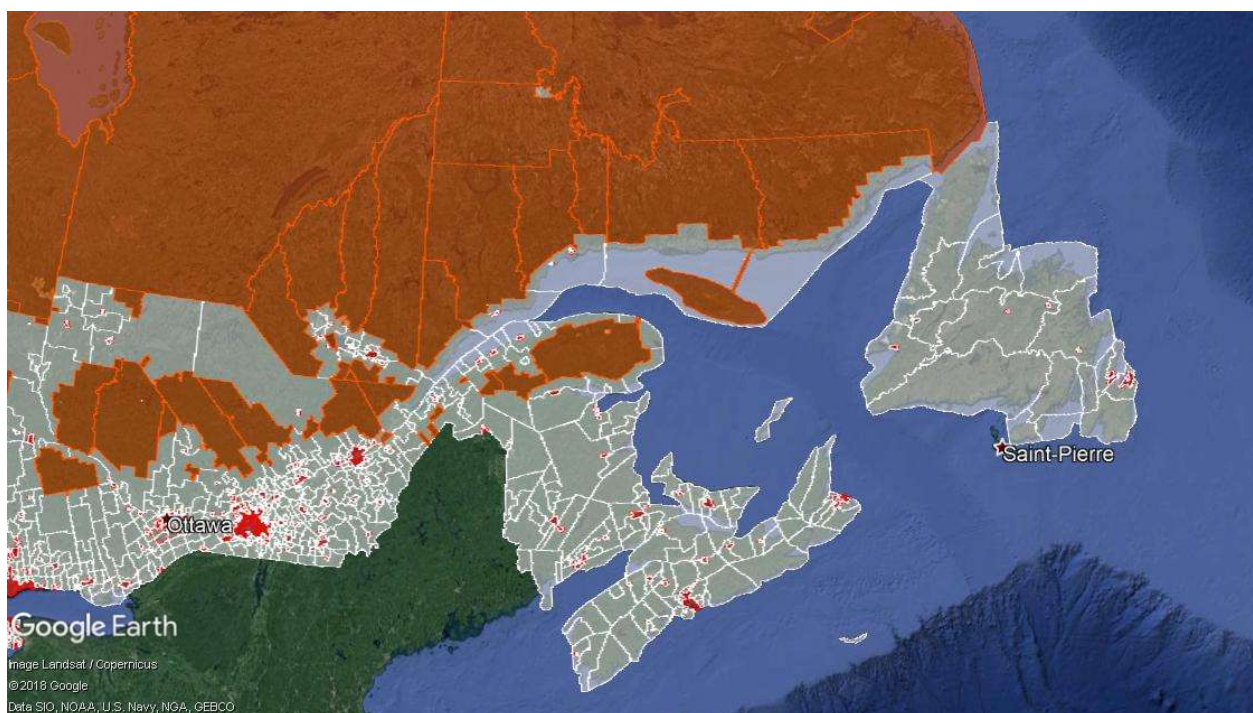
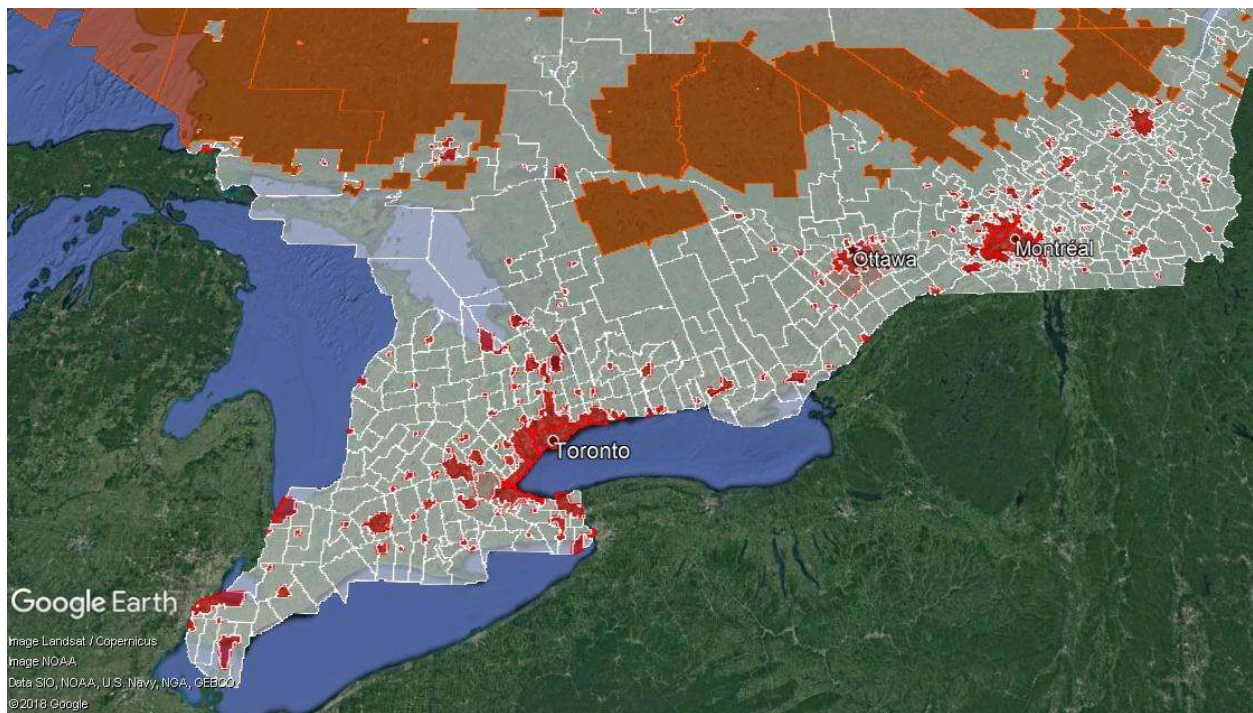
## Appendix C

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### Indicative Maps of Joint Proposal Tier 5 Service Areas









Note: urban Tier 5 service areas are indicated in red, rural Tier 5 service areas are indicated in white and remote Tier 5 service areas are indicated in orange.

## Appendix D

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### KMZ Map Files

KMZ file of boundaries of Tier 5 service areas generated by the methodology of the Joint Proposal, filed as a separate document.

- Joint Proposal Tier-5 Option 3 2019-02-19 b.kmz

## Appendix E

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### List of Tier 5 Service Areas

Excel spreadsheet of Tier 5 service areas and associated demographic information generated by the methodology of the Joint Proposal, filed as a separate document.

- Joint Proposal Tier-5 Option 3 2019-02-19.xlsx