

**CANADA GAZETTE NOTICE NO. DGSO-002-18**

**CONSULTATION ON A NEW SET OF SERVICE AREAS FOR  
SPECTRUM LICENSING**

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**COMMENTS  
OF  
BELL MOBILITY INC.**

**19 FEBRUARY 2019**

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## 1.0 **EXECUTIVE SUMMARY**

1. In accordance with the procedure set out by Innovation, Science and Economic Development Canada (the Department or ISED) in Notice No. DGSO-002-18, *Consultation on a New Set of Service Areas for Spectrum Licensing*, dated 27 November 2018 (the Consultation), we are providing our Comments on the proposal to create a new tier of smaller service areas for spectrum licensing (Tier 5) to complement ISED's existing suite of four spectrum licensing tiers.

2. The Department does not need to create a smaller tier size to achieve their stated goals. The creation of Tier 5 service areas will lead to significant interference challenges, inefficient deployment, and an unnecessarily complex auction process. Thus, we do not recommend that the Department create a new set of smaller service areas for spectrum licensing and, at a minimum, urge the Department to refrain from employing such service areas in the low-to-mid band spectrum range.

3. The current framework of four service area tiers has successfully enabled the extensive deployment of networks in rural areas. For example, our LTE network covers 99% of Canada's population while our LTE Advanced (LTE-A) network provides coverage to 91% of Canadians and we continue to invest in serving rural and remote communities. We are also deploying wireless-to-the-home (WTTH) fixed wireless broadband Internet service to rural and underserved communities. This service uses 5G-capable technology and 3500 MHz spectrum to deliver high-speed broadband Internet service to smaller towns and rural communities. WTTH is available in 28 rural communities in Ontario and Quebec, and we expect the service to reach about 200,000 households in 138 communities in 2019.

4. Interference is already a significant issue for wireless operators, and dividing licences up into even smaller areas would exacerbate the problem. Creating smaller licence areas would increase the number of borders that operators will need to coordinate with one another. The necessary interference mitigation practices would prevent licensees from using their spectrum to its fullest extent. In an environment of steadily growing demand for commercial mobile spectrum, which requires operators to maximize the use of this limited resource, a licensing system based on Tier 5 areas would impede this goal by promoting spectral inefficiency.

5. If, despite our objections, the Department creates Tier 5 service areas, then the proposed design principles are reasonable but incomplete. Specifically, we recommend the addition of the following design principle to those proposed by the Department: ensure Tier 5 service areas do not nest within each other. Having Tier 5 service areas within other Tier 5 service areas would lead to circumstances in which wireless operators have holes within their network territory. As a result, wireless providers may end up with non-contiguous network deployment within a single licence area. This could be particularly problematic for wireless operators deploying network along major transportation corridors. For example, the network will be deployed along one stretch of highway, followed by a gap because the highway crosses into another operator's licence area, and then continues on the other side when the highway once again enters into the original operator's licence area.

6. If the Department chooses to allocate spectrum using Tier 5 service areas, it is imperative that they only do so for a limited portion of the spectrum band. The remaining spectrum should be auctioned using larger service areas (i.e., Tier 2 and Tier 3). We note that such a model would not necessitate the use of a set-aside and can be implemented within existing auction frameworks. For example, in the Advanced Wireless Services (AWS)-1 auction, certain blocks were auctioned on a Tier 2 basis, while others were auctioned on a Tier 3 basis.

7. Of the two options set out in the Consultation, Option 1 is preferred to Option 2 as it is better aligned with the design principles and minimizes the number of occurrences where a Tier 5 service area is nested within another Tier 5 service area. However, using census subdivisions (CSDs) as proposed in Option 1 will create 5,162 service areas. This is 30 times more than the number of Tier 4 service areas and, as a result, fraught with operational problems for the industry. Thus, the number of proposed service areas must be drastically reduced in the interest of interference mitigation as well as administrative feasibility.

8. Currently the Department has four service area tiers that can be used for the competitive licensing of spectrum.<sup>1</sup> There are 59 Tier 3 service areas which is four times more than the 14 Tier 2 service areas. There are also 172 Tier 4 service areas which is three times more than the number of Tier 3 service areas. Continuing this trend implies that the number of Tier 5 service areas should be two times the number of Tier 4 service areas and should certainly not exceed three times the number of Tier 4 service areas. As a result, a maximum of 300 to 500

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<sup>1</sup> The Consultation, paragraph 6.

Tier 5 service areas would be far more reasonable than the more than 5,000 service areas that would result if CSDs are used. To reach this target, census divisions would be a more appropriate choice.

9. Census divisions are "intermediate geographic areas between the province/territory level and the municipality (census subdivision)."<sup>2</sup> There are currently 293 census divisions in Canada. Similar to CSDs, census divisions are well defined areas that are used for statistical purposes. Since they are the intermediate geographic area between a province/territory and a census subdivision, their borders may be easily aligned with existing Tier 4 service areas (which were created using CSDs) and Tier 2 service areas (which are similar to the geographic areas of provinces and territories). Moreover, census divisions consider the geographic differences between urban and rural areas and have well defined borders and population characteristics to better understand the commercial viability of the area. Therefore, census divisions satisfy the proposed design principles and represent a more appropriate construct for defining Tier 5 service areas.

10. If the Department does not adopt census divisions, then we recommend reducing the proposed number of Tier 5 service areas by amalgamating CSDs into larger groupings. Reducing the number of Tier 5 service areas, e.g., to a level closer to 500, can be facilitated by using an amalgamation process similar to the following:

- Step 1: Amalgamate CSDs that are contained within another CSD such that there will be no Tier 5 service area contained within another Tier 5 service area;
- Step 2: Amalgamate CSDs until they approximately replicate the area of a large population centre;
- Step 3: Amalgamate contiguous CSDs with a population of less than 30,000 until the combined population is approximately 30,000, or to a maximum of the population of the corresponding Tier 4 service area. CSDs with a population over 30,000 do not need to be amalgamated; and
- Step 4: Ensure that Tier 5 service areas are contained within a Tier 4 service area such that a Tier 5 service area is not included in more than one Tier 4 service area.

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<sup>2</sup> Statistics Canada, see <https://www150.statcan.gc.ca/n1/pub/92-195-x/2011001/geo/cd-dr/def-eng.htm>.

11. Following the above process will significantly reduce the number of Tier 5 service areas from over 5,000 to approximately 500. In addition, we see no reason why either of our proposed changes to Option 1 would be unsuitable for northern and rural areas.

## **2.0 EXISTING TIER SIZES ARE APPROPRIATE FOR ISED'S GOALS**

12. The Department suggests that creating a new tier of smaller service areas (Tier 5) will help meet future wireless needs, encourage rural access to spectrum, and support new technologies and emerging use cases.<sup>3</sup> However, smaller service areas are not necessary to achieve these goals. Moreover, the creation of Tier 5 service areas will lead to significant interference challenges, inefficient deployment, and an unnecessarily complex auction process. Thus, we do not recommend that the Department create a new set of smaller service areas for spectrum licensing and, at a minimum, urge the Department to refrain from employing such service areas in the low-to-mid band spectrum range.

### **2.1 Deployment Occurs With Larger Tier Sizes**

13. Although the Consultation suggests that licensing smaller service areas "may further facilitate access to spectrum for all service providers, particularly in rural areas"<sup>4</sup>, the absence of service areas smaller than Tier 4 has not prevented the deployment of networks in rural areas. Our LTE network reaches 99% of Canadians while our LTE-A network provides coverage to 91% of Canadians and we continue to invest in serving rural and remote communities. For example, in September 2018, we announced the latest expansion of our LTE-A wireless coverage in Manitoba, extending wireless service for the first time to the Southeastern communities of Stuartburn, Woodridge and Zhoda. We are also trialing LTE wireless service in Iqaluit and Rankin Inlet and have plans to connect 13 more Nunavut communities.<sup>5</sup> By the end of 2019, we expect our LTE-A network will reach 94% of Canadians.

14. We are also deploying our WTTH fixed wireless broadband Internet service to rural and underserved communities. WTTH uses 5G-capable technology and 3500 MHz spectrum to deliver high-speed broadband Internet service to smaller towns and rural communities. It is available in 28 rural communities in Ontario and Quebec, and we expect the service to reach

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<sup>3</sup> The Consultation, paragraph 1.

<sup>4</sup> The Consultation, paragraph 12.

<sup>5</sup> BCE News Release, "BCE reports third quarter 2018 results", available at <http://www.bce.ca/investors/financial-reporting/2018-Q3/2018-q3-press-release.pdf>.

about 200,000 households in 138 communities in 2019. Our WTTH rollout plan is to ultimately reach 1.2 million rural households.<sup>6</sup>

15. While the Department suggests that the anticipated use of higher frequency bands to support 5G technologies will be "well-suited" to licensing through smaller service areas, smaller service areas are not required to facilitate the deployment of 5G technologies. 5G technologies and small cell networks will be deployed where there is sufficient demand to make it economically feasible to provide 5G services. Having smaller service areas will not increase or decrease the demand for 5G services but may decrease the viability of deploying 5G in a particular service area.

16. Existing service areas and licensing frameworks already provide opportunities for smaller providers to acquire spectrum licences that suit their business needs. If a smaller provider desires an even more localized spectrum licence than what can be purchased at auction, they can seek to acquire this through a transfer or subordination agreement with another licence holder. This is demonstrated by the fact that, of the 35 subordination agreements approved by the Department since January 2015, 15 (or 42%) have involved a national or regional carrier subordinating spectrum to a small (i.e., non-national, non-regional) carrier.<sup>7</sup> Small wireless providers are also able to subordinate spectrum licences for very small areas. For instance, in March 2018 the Department approved a subordination from Videotron to the Kativik Regional Government for two licences in the Broadband Radio Service bands which carved out a sub-Tier 4 service area in Quebec, north of the 55<sup>th</sup> parallel.<sup>8</sup> Similarly, in March 2015 the Department issued a subordinate licence to Ice Wireless for two small 30 km subdivisions of Rogers' cellular band licence.<sup>9</sup>

## **2.2 Smaller Licence Areas Lead to Unnecessary Inefficiency and Complexity**

17. Interference is already a significant issue for wireless operators, and dividing licences into even smaller areas would exacerbate the problem. Creating smaller service areas increases the number of borders that operators will need to coordinate with one another. This is

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<sup>6</sup> BCE News Release, "BCE reports 2018 Q4 and full-year results, announces 2019 financial targets - 5% dividend increase to \$3.17 per year", available at <http://www.bce.ca/news-and-media/releases/show/BCE-reports-2018-Q4-and-full-year-results-announces-2019-financial-targets-5-dividend-increase-to-3-17-per-year-1>.

<sup>7</sup> Internal study conducted February 2019.

<sup>8</sup> 8 March 2018, *Subordinate Spectrum Licences Held by Vidéotron Ltd. to the Kativik Regional Government*. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11378.html#aA>.

<sup>9</sup> 5 March 2015, *Subordinate Licence for Spectrum Licence Held by Rogers Communications Partnership to Ice Wireless Inc.* Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10949.html>.

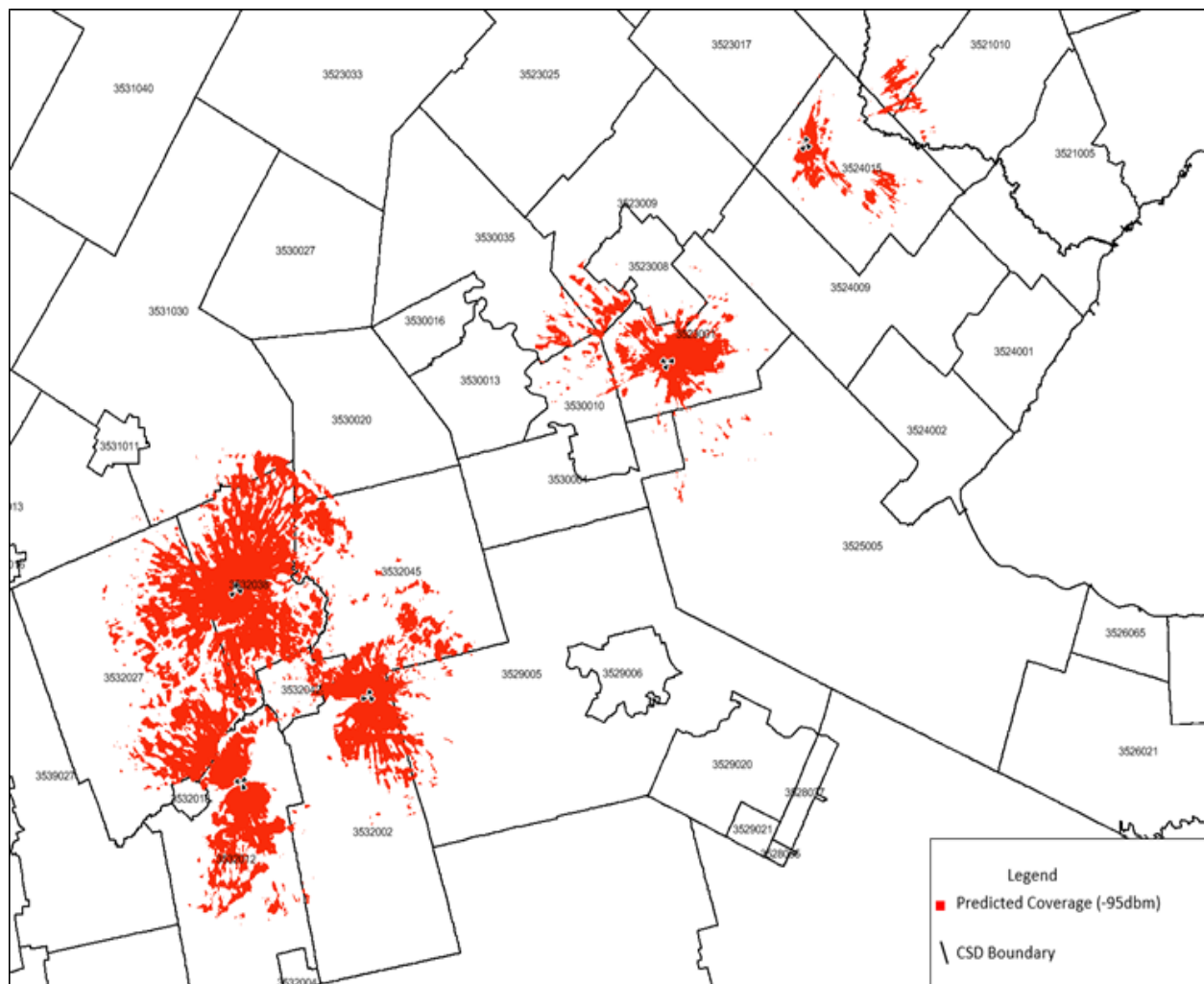
particularly challenging in bands where licence holders utilize different technologies that require coordination. In the 3500 MHz band, for example, time-division duplexing (TDD)-LTE and WiMax (802.16e) technologies can only be synchronized under a narrow set of parameters. A large number of adjacent operators who would be forced to coordinate with one another in a band licensed on a Tier 5 basis could potentially make synchronization unfeasible, or at the very least would add significant complexity to the use of that band.

18. Even when operators are using the same technology, such as TDD-LTE or TDD-5G, they still need to synchronize their stations with one another through the use of a common time source and frame configuration. For instance, if wireless operators are implementing different frame configurations with respect to the assignments between downlink and uplink, then they will be required to synchronize their stations to the lowest common denominator of adjacent operators in order to mitigate interference. For example, if an operator along one licence area border implements frame configurations with a higher ratio of downlink frames, while another operator uses a frame configuration with a higher ratio of uplink frames along another border, then both operators would be required to synchronize to a solution that has equal downlink and uplink frames as a compromise. As a result, the more advanced operator would not be able to take full advantage of its network's capabilities and customer performance would suffer.

19. There are also significant interference issues stemming from the propagation characteristics of low-to-mid band spectrum. Creating smaller licence areas increases the number of borders that operators will need to coordinate with one another mostly through attenuation efforts; otherwise radio frequency spillage outside a licenced CSD would be inevitable. For example, Figure 1 provides an example of 3500 MHz with antennas located in the CSDs of Halton Hills, ON (3524015), Guelph/Eramosa, ON (3523009), East Zorra-Tavistock, ON (3532038), Norwich, ON (3532002), and South-West Oxford, ON (3532012). It is clear that with 3500 MHz spectrum, the signal will easily extend past the border of smaller service areas such as those based on census subdivisions.



**Figure 1: Predicted Coverage of 3500 MHz Spectrum**



20. To manage interference issues the Department would need to establish some form of spectrum segregation rules or adjust the technical specifications. This could result in smaller channel bandwidths, which would reduce the amount of useable spectrum, or alternatively down tilting of antennae, which would reduce the available operating territory of an already constrained service area. Some of the proposed areas may be so small that interference issues would render them unusable, particularly for spectrum with larger propagation characteristics.

21. Regardless of the method, the necessary interference mitigation practices related to Tier 5 service areas would prevent licensees from using their spectrum to its fullest extent. In the context of growing demand for commercial mobile spectrum, the Department has acknowledged the need to "maximize" the use of an increasingly limited resource.<sup>10</sup> A licensing

<sup>10</sup> SLPB-003-18, *Spectrum Outlook 2018-2022*, paragraph 13.

system based on Tier 5 service areas would impede this goal by introducing spectral inefficiency.

22. The Consultation also states that smaller service areas would allow the Department to tailor deployment conditions to smaller individual areas.<sup>11</sup> Doing so, however, could lead to wireless operators being forced to deploy in areas where there is insufficient demand to justify building and operating a network. Deployments built for regulatory, rather than economic, reasons are an inefficient use of capital and divert investments from areas where real demand exists.

23. Finally, the current spectrum licensing and management system is already complex and smaller providers have raised concerns about auction complexity with Tier 2 and Tier 3 service areas.<sup>12</sup> Adding hundreds or thousands of additional service areas on which licences may be issued would add unnecessarily to the administrative burden of the Department and wireless operators. In addition, incorporating such a high number of licence areas into a spectrum auction would significantly complicate the auction process.

24. For example, consider a situation where there are five potential spectrum blocks for sale and the Tier 5 service area is based on CSDs. This could result in a bidder having to check 25,810 (or 5 x 5,162) different elements of their bid each round and then having to track those elements across multiple rounds. With this additional complexity, the potential for errors and inefficient bidding increases. Moreover, if there are seven bidders participating, then the Department may need to track over 180,000 different elements each round. Even if an auction process can incorporate a large number of service areas, it does not mean that it is the most efficient and cost effective way to proceed.

25. If the Department chooses to allocate spectrum using Tier 5 service areas, it is imperative to only do so for a limited portion of the spectrum band. The remaining spectrum should be auctioned using larger service areas (i.e., Tier 2 and Tier 3). This targeted approach will limit the harm caused by the complexities and inefficiencies of having so many service areas. We note that such a model would not necessitate the use of a set-aside and can be

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<sup>11</sup> The Consultation, paragraph 29.

<sup>12</sup> *Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band*, paragraphs 89, 93 and 96; *Licensing Framework for Broadband Radio Service (BRS) — 2500 MHz Band*, paragraph 42; and *Licensing Framework for Mobile Broadband Services (MBS) — 700 MHz Band*, paragraph 26.

implemented within existing auction frameworks. For example, in the AWS-1 auction, certain blocks were auctioned on a Tier 2 basis, while others were auctioned on a Tier 3 basis.

26. In summary, the creation of Tier 5 service areas could lead to significant interference challenges, inefficient deployment, and an unnecessarily complex auction process. Thus, we do not recommend that the Department create a new set of smaller service areas for spectrum licensing, and in particular urge the Department to refrain from employing such service areas in the low-to-mid band spectrum range.

### **3.0 RESPONSES TO QUESTIONS**

**Q1. A) ISED is seeking comments on the proposed design principles when providing responses, include supporting arguments for or against the proposed principles.**

**B) ISED is seeking any suggestions on additional design principles that should be considered.**

27. Despite our objection to Tier 5 service areas, if the Department intends to create such service areas, then the proposed design principles are reasonable but incomplete. When designing any new service area tier, the chosen methodology should take economic viability and population patterns into account, and ensure that borders run through unpopulated areas. All tiers should nest into one another to simplify spectrum management.

28. In addition, the Department should ensure that all Tier 5 service areas are mutually exclusive, both to align with the existing licensing structure and to prevent administrative and technical complications. Specifically, we recommend the addition of the following design principle to those proposed by the Department: ensure Tier 5 service areas do not nest within other Tier 5 service areas.

29. Both of the Department's proposed options result in Tier 5 service areas being nested within other Tier 5 service areas. For example, the Consultation shows that there are many CSDs located entirely within other CSDs. Several of these have been highlighted in Figure 2. Figure 3 shows a similar problem if the proposed Tier 5 service areas are based on population centres.

Figure 2: Nested CSDs in ISED's Option 1<sup>13</sup>

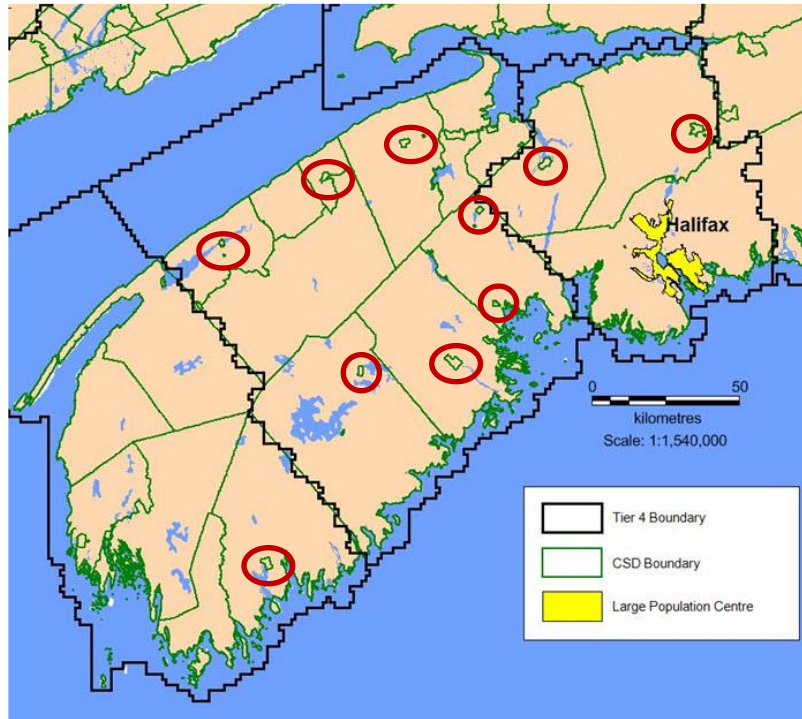
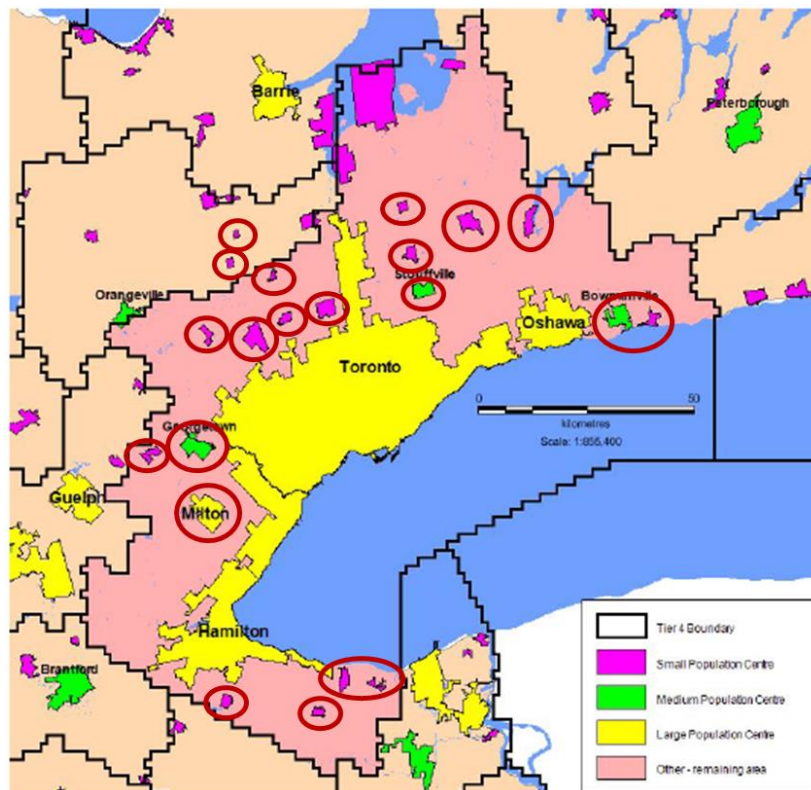


Figure 3: Nested Population Centres in ISED's Option 2<sup>14</sup>



<sup>13</sup> The Consultation, Figure 2, page 9. Notations in red added.

<sup>14</sup> The Consultation, Figure 3, page 12. Notations in red added.

30. If Tier 5 service areas are based on CSDs, then they should all be amalgamated to ensure that no Tier 5 service areas are nested within each other. Failure to do so would create an unnecessarily complicated set of service areas with serious interference management challenges. Having Tier 5 service areas nested within each other will result in a significant increase in the number of licence area borders that operators will be required to coordinate. In addition, some of the CSDs nested within other CSDs may be so small that preventing interference would be virtually impossible.

31. Having Tier 5 service areas within other Tier 5 service areas would also lead to circumstances in which carriers have holes within their network territory. As shown in Figure 3, this may be a significant problem if the Tier 5 service areas are based on population centres. As a result, wireless network providers may end up with non-contiguous network deployment within their licence area. This could be particularly problematic for wireless operators deploying network along major transportation corridors. For example, the network will be deployed along one stretch of highway, followed by a gap because the highway crosses into another operator's licence area, and then continues on the other side when the highway once again enters into the original operator's licence area. Moreover, it may not be possible to meaningfully amalgamate Tier 5 service areas if they are based on population centres. What would occur is that small and medium population centres would be amalgamated into the larger "other remaining areas", thus defeating the purpose of separating the areas based on population centres. Therefore, we recommend that the Department ensure that all Tier 5 service areas are mutually exclusive to avoid creating these problems.

**Q2. A) ISED is seeking comments on the suitability of Option 1 in addressing the proposed design principles.**

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

**C) 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.**

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

32. Of the two options set out in the Consultation, Option 1 is preferred to Option 2 as it is better aligned with the proposed design principles and minimizes the number of occurrences where a Tier 5 service area is nested within another Tier 5 service area. Basing the Tier 5

service areas on CSDs would ensure that they are reflective of the population distribution and unique characteristics of both urban and rural areas because CSDs are derived from existing municipal boundaries and therefore naturally align with population patterns.

33. However, using CSDs as proposed in Option 1 will create 5,162 service areas.<sup>15</sup> This is 30 times more than the number of Tier 4 service areas and, as a result, fraught with operational problems for the industry. For example, Saskatchewan has a population of about 1.2 million<sup>16</sup> but would have 950 service areas, which is excessive.<sup>17</sup> Thus, the number of proposed service areas must be drastically reduced in the interest of interference mitigation as well as administrative feasibility.

34. While the proposed Option 1 does not favour one technology over another, interference and coordination will be a significant issue for low- and mid-band frequencies, as the Department acknowledges.<sup>18</sup> Unless the Department significantly reduces the number of the proposed service areas, they will simply not be feasible for use when licensing low- and mid-band spectrum.

35. Currently the Department has four service area tiers that can be used for the competitive licensing of spectrum.<sup>19</sup> There are 59 Tier 3 service areas which is four times more than the 14 Tier 2 service areas. There are also 172 Tier 4 service areas which is three times more than the number of Tier 3 service areas. Continuing this trend implies that the number of Tier 5 service area should be two times the number of Tier 4 service areas and should certainly not exceed three times the number of Tier 4 service areas. As a result, a maximum of 300 to 500 Tier 5 service areas would be far more reasonable than the more than 5,000 service areas that would result if CSDs are used. To reach this target, census divisions would be a more appropriate choice.

36. Census divisions are "intermediate geographic areas between the province/territory level and the municipality (census subdivision)."<sup>20</sup> There are currently 293 census divisions in Canada. Similar to CSDs, census divisions are well defined areas that are used for statistical

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<sup>15</sup> The Consultation, paragraph 39.

<sup>16</sup> See <https://www.saskatchewan.ca/government/news-and-media/2018/december/20/population-stats>.

<sup>17</sup> See <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/search-recherche/ist/results-resultats.cfm?Lang=E&TABID=1&G=1&Geo1=&Code1=&Geo2=&Code2=&GEOCODE=47#>.

<sup>18</sup> The Consultation, paragraph 32.

<sup>19</sup> The Consultation, paragraph 6.

<sup>20</sup> Statistics Canada, see <https://www150.statcan.gc.ca/n1/pub/92-195-x/2011001/geo/cd-dr/def-eng.htm>.

purposes. Since they are the intermediate geographic area between a province/territory and a census subdivision, their borders may be easily aligned with existing Tier 4 service areas (which were created using CSDs) and Tier 2 service areas (which are similar to the geographic areas of provinces and territories).

37. In addition, as indicated above, there are 70% more census divisions than there are Tier 4 service areas, which will achieve the Department's objective of licensing smaller service areas. For example, there are 40 Tier 4 service areas and 97 census divisions in Quebec. Moreover, census divisions consider the geographic differences between urban and rural areas and have well defined borders and population characteristics to better understand the commercial viability of the area.

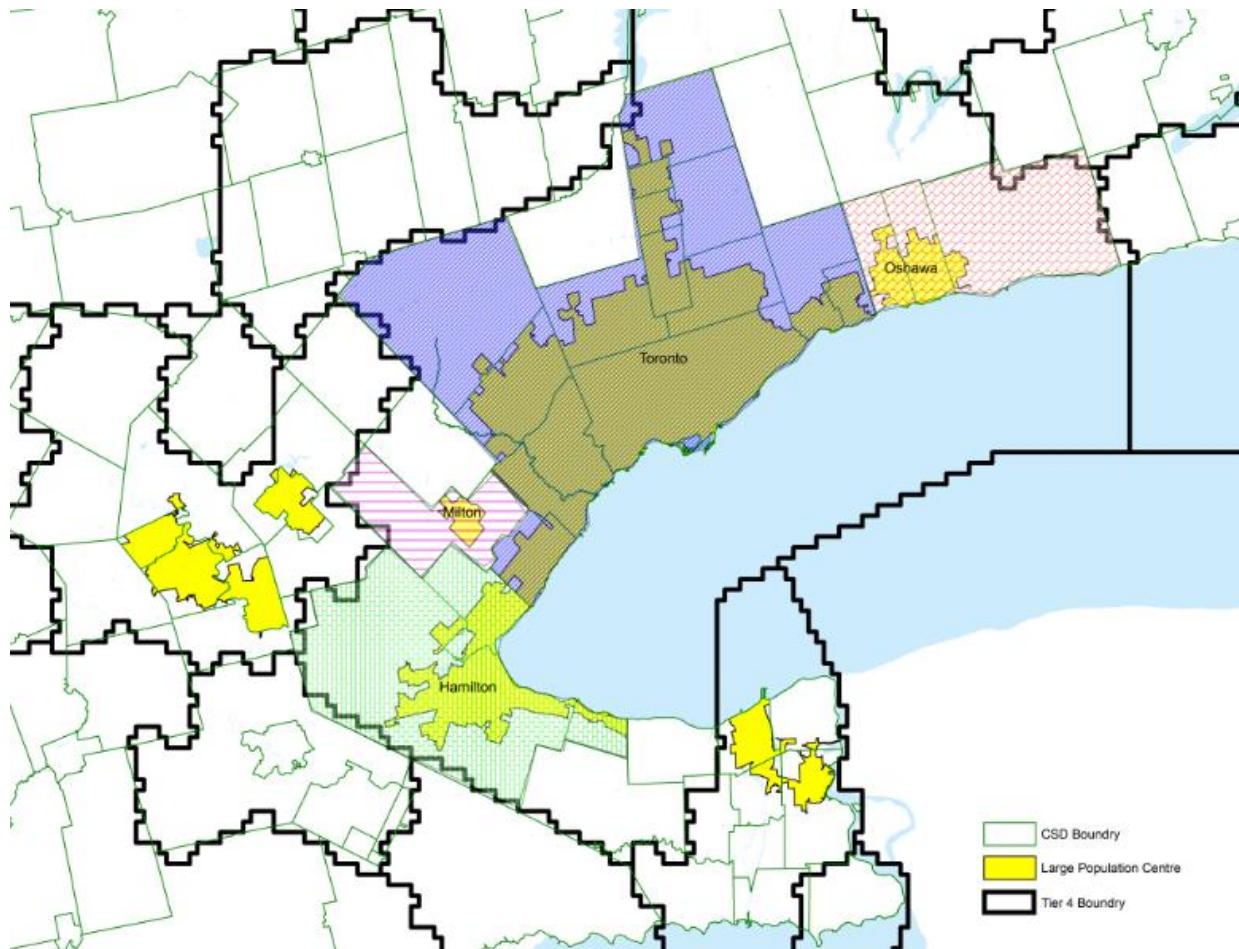
38. Census divisions also satisfy our additional proposed design principle that Tier 5 service areas do not nest within other Tier 5 service areas. As it did with Tier 4 service areas, the Department can slightly alter the boundaries of the census divisions to ensure that they go through less populated areas. Therefore, census divisions satisfy the proposed design principles, and represent a more appropriate construct for defining Tier 5 service areas.

39. However, if the Department does not adopt census divisions, then we recommend reducing the number of Tier 5 service areas by amalgamating CSDs into larger groupings. CSDs can serve as good building blocks for a service area and creating licence areas out of CSD amalgamations will enable the Department to easily place tier boundaries through lesser populated areas. We note Tier 4 service areas were also created from the amalgamation of CSDs, and therefore this method will be simple to align with the existing licence areas.

40. As shown in Figure 4, CSDs could be combined until they approximate the service area based on a large population centres and we therefore support the proposal to combine all urban CSDs into a single service area. In the case shown in Figure 4, the number of service areas would be reduced from 21 to 4. Without doing so, it would be extremely difficult for operators to limit signal interference while providing an adequate signal level for service, especially along the boundaries of the service area.



**Figure 4: Amalgamation of CSDs into a Large Population Centre**



41. We do not recommend that the Department use the size of the geographic area in question as the basis for reducing the number of CSD-based service areas. As noted above, geographic area is not a good proxy for determining the level of demand or the economic feasibility of deploying a network. Rather, we recommend that amalgamation be based on population. For example, contiguous CSDs with a population of less than 30,000 should be amalgamated until the combined population is approximately 30,000, or to a maximum of the population of the corresponding Tier 4 area.<sup>21</sup> A population size of 30,000 is consistent with the demarcation between small and medium population centres<sup>22</sup> and this amalgamation would result in greater uniformity of population for smaller Tier 5 service areas. CSDs with a population over 30,000 do not need to be amalgamated.

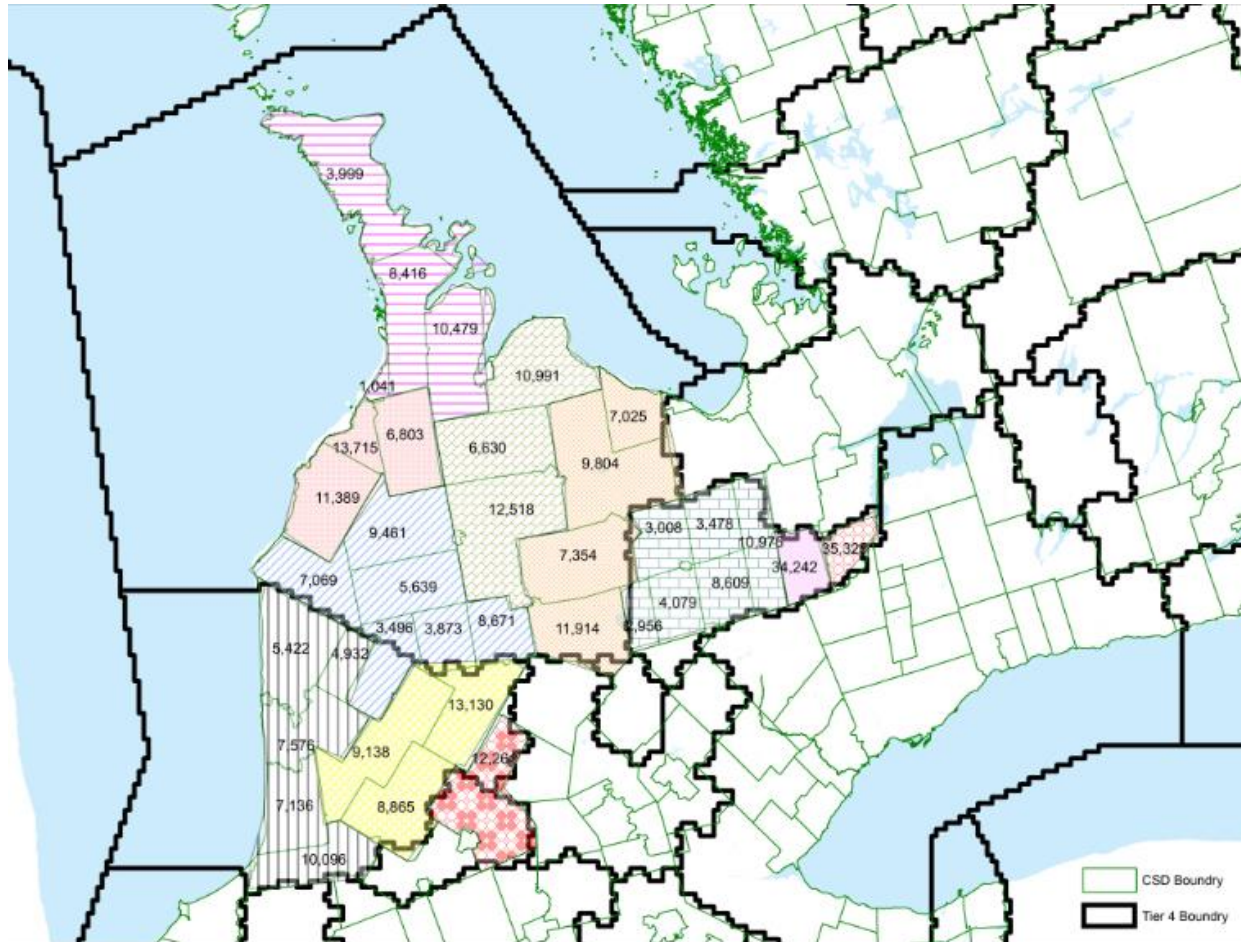
<sup>21</sup> For example, the population of Tier 4 area 4-036 La Tuque is only 16,396. Thus, in this situation the Tier 4 and Tier 5 area would be the same. In addition, given the variation in population for each CSD, it may not be possible to always achieve an amalgamation of 30,000. Thus, 30,000 should be treated as a guideline with amalgamations in some instances being closer to 25,000 and in others, closer to 35,000.

<sup>22</sup> The Consultation, paragraph 48.



42. Figure 5 shows what such an amalgamation would look like in Southern Ontario. While there are many different combinations possible, the example presented in Figure 5 shows that the number of potential licence areas would be reduced from 37 to 11. The result is even more dramatic for Saskatchewan which would see a reduction from 950 service areas to approximately 25 service areas.

**Figure 5: Example of Population-based Amalgamation in Southern Ontario**



43. Therefore, reducing the proposed number of Tier 5 service areas, e.g., to a level closer to 500, can be facilitated by using an amalgamation process similar to the following:

- Step 1: Amalgamate CSDs that are contained within another CSD such that there will be no Tier 5 service area contained within another Tier 5 service area;
- Step 2: Amalgamate CSDs until they approximately replicate the area of a large population centre;
- Step 3: Amalgamate contiguous CSDs with a population of less than 30,000 until the combined population is approximately 30,000, or to a maximum of the

population of the corresponding Tier 4 service area. CSDs with a population over 30,000 do not need to be amalgamated; and

Step 4: Ensure that Tier 5 service areas are contained within a Tier 4 service area such that a Tier 5 service area is not included in more than one Tier 4 service area.

44. Following this process will reduce the number of Tier 5 service areas to approximately 500. Finally, we see no reason why either of our proposed changes to Option 1 would be unsuitable for northern and rural areas.

**Q3. A) ISED is seeking comments on the suitability of Option 2 in addressing the proposed design principles.**

**B) 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.**

**C) 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).**

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

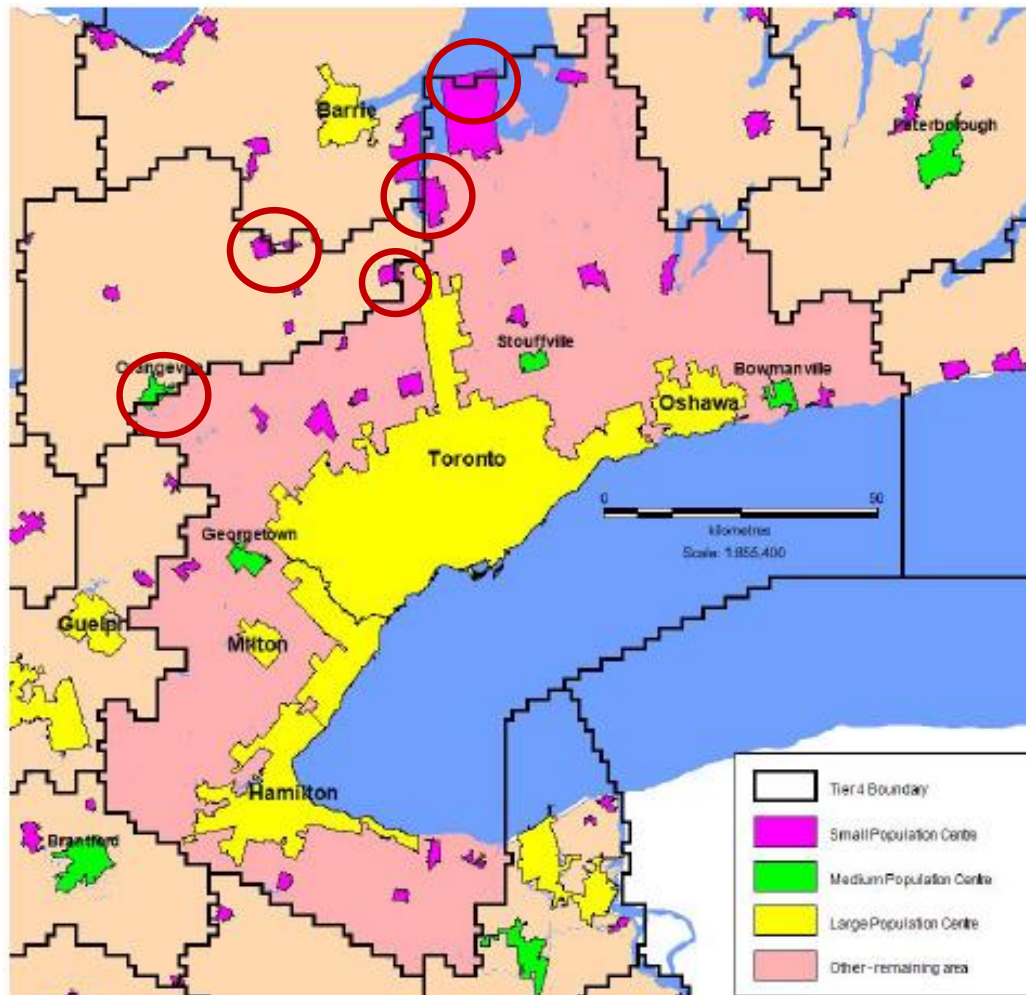
**E) ISED is seeking comments on whether population centres, which have adjacent boundaries, should be amalgamated to form a single service area.**

45. As noted above, we do not support the creation of smaller Tier 5 service areas, but if the Department decides to adopt a new Tier 5 service area then we recommend it be based on CSDs rather than population centres. Option 2, which is based on population centres, does not allow Tier 5 service areas to nest into Tier 4 service areas in a seamless fashion. In fact, Option 2 creates a number of instances where Tier 5 service areas will be nested within other Tier 5 service areas.

46. Since Tier 4 service areas were not derived by amalgamating census population centres, there will be a number of instances where the Tier 5 service area will not nest within a Tier 4 service area. Figure 6 shows a number of instances where this is the case in the Greater Toronto Area. As a result, Tier 5 service areas based on CSDs are better aligned with the

Department's proposed design principle that "Tier 5 areas should nest within the current Tier 4 areas."<sup>23</sup>

**Figure 6: Tier 5 Areas Based on Population Centres Do Not Nest Into Tier 4 Areas<sup>24</sup>**



47. As noted above in response to question 1, it is not clear how Tier 5 service areas could be amalgamated to alleviate this problem. What would occur is that small and medium population centres would be amalgamated into the larger "other remaining areas", thus defeating the purpose of separating the areas based on population centres. Moreover, changing the proposed minimum for small population centre service areas would not alleviate this problem. As a result, Tier 5 service areas based on CSDs better address our proposed design principle to ensure Tier 5 service areas do not nest within other Tier 5 service areas.

<sup>23</sup> The Consultation, paragraph 34.

<sup>24</sup> The Consultation, Figure 3, page 12. Notations in red added.

48. We do not recommend that the Department licence spectrum in "other service areas" differently such as on a shared or first-come first-served basis. Even though the population in "other service areas" is below 2,000, there will still be situations where operators will want to continue their network deployment into these areas. For example, major transportation corridors are likely to go through "other service areas". As a result, spectrum in areas with low population may still be valuable and should be efficiently allocated to those that value it the most.

49. As with the Department's proposed Option 1, there is no reason to believe that Option 2 could not be applied to northern areas. The main outcome is that for northern areas there will be large geographic areas that will be defined as "other" service areas.

**Q4. 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.***

50. Our alternative proposals for smaller services areas are provided in the sections above.

#### **4.0 CONCLUSION**

51. The Department does not need to create a smaller tier size to achieve their stated goals. The current framework of four service area tiers has successfully enabled the extensive deployment of networks in rural areas. The creation of Tier 5 service areas could lead to significant interference challenges, inefficient network deployment, and an unnecessarily complex auction process. Thus, we do not recommend that the Department create a new set of smaller service areas for spectrum licensing and, at a minimum, urge the Department to refrain from employing such service areas in the low-to-mid band spectrum range.

52. If despite our objections, the Department chooses to allocate spectrum using Tier 5 service areas, it is imperative that they only do so for a limited portion of the spectrum band. The remaining spectrum should be auctioned using larger service areas (i.e., Tier 2 and Tier 3). We note that such a model would not necessitate the use of a set-aside and can be implemented within existing auction frameworks.

53. Of the two options set out in the Consultation, Option 1 is preferred to Option 2 as it is better aligned with the design principles and minimizes the number of occurrences where a Tier 5 service area is nested within another Tier 5 service area. However, using CSDs as proposed in Option 1 will create 5,162 licence areas. This is 30 times more than the number of Tier 4 service areas and, as a result, fraught with operational problems for the industry. Thus, the number of proposed service areas must be drastically reduced in the interest of interference mitigation as well as administrative feasibility. A maximum of 300 to 500 Tier 5 service areas would be far more reasonable than the more than 5,000 service areas that would result if CSDs are used. To reach this target, census divisions would be a more appropriate choice.

54. There are currently 293 census divisions in Canada and similar to CSDs, census divisions are well defined areas that are used for statistical purposes. Census divisions also satisfy the Department's design principles, and have defined maps that are consistent with CSDs and provincial/territorial boundaries. Therefore, if the Department adopts Tier 5 service areas, census divisions represent a more appropriate construct.

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