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In Canada, the sub-bands 768-776 MHz and 798-806 MHz (16 MHz in total) have been designated for public safety narrowband and wideband. Although an additional 8 MHz has also been designated for public safety in the sub-bands 764-768 MHz and 794-798 MHz, its use has yet to be defined. In Canada, in the 700 MHz band, there is currently no spectrum designated for public safety broadband. Furthermore, the sub-bands 758-764 MHz and 788-794 MHz, which correspond to the U.S. D Block plus an extra 1 MHz (763-764 MHz and 793-794 MHz), have not been subject to consultation.

**5-6. Notwithstanding your responses to questions 5-3 to 5-5, the Department seeks comments on whether public safety broadband needs can be met by using commercial systems with priority access rights for public safety, at commercial rates.**

- (a) Your views and comments are invited on priority access rights, including pre-emption, and on the feasibility of such a system.**
- (b) What public safety technical and operational requirements cannot be met by commercial systems, from either a public safety or commercial operator point of view?**
- (c) What specific rules, if any, should be mandated by the Department to make such a system viable?**

**5-7. Comments are sought on the need for regional (local, provincial, etc.) dedicated broadband networks to provide access to all public safety agencies, and the institutional<sup>22</sup> feasibility of implementing such a system.**

**5-8. Is there a need for a dedicated national interoperable broadband network to provide access to all public safety agencies? The Department seeks comments on the institutional feasibility of implementing such a system.**

**Provide supporting arguments for your responses to the above questions.**

## **700 MHz Band Plan Architecture for Public Safety Systems**

The current Canadian spectrum designation to public safety of 4 + 4 MHz does not align with the United States, would complicate cross-border interoperability and may require unique equipment to be developed. Therefore, it is not being considered as a practical band plan configuration.

In preparation for the auction of the 700 MHz commercial spectrum, Industry Canada is considering the following three options with respect to designating spectrum for broadband public safety and/or commercial systems use in the sub-bands 758-768 MHz and 788-798 MHz:

- **Option 1** designates 5 + 5 MHz to public safety systems and 5 + 5 MHz to commercial systems;

<sup>22</sup> Governance, licensing structure, financing, technical and operational, etc.

- **Option 2** designates the entire 10 + 10 MHz of spectrum for commercial systems, with possible provisions for priority access for public safety systems;
- **Option 3** designates the entire 10 + 10 MHz of spectrum for public safety systems.

Options 1 and 3 assume that public safety agencies will deploy private broadband networks dedicated to public safety agencies, including radio access and backhaul networks. One of the considerations to be addressed is how to ensure that all public safety services (firefighters, paramedics and police) have access to the public safety broadband network.

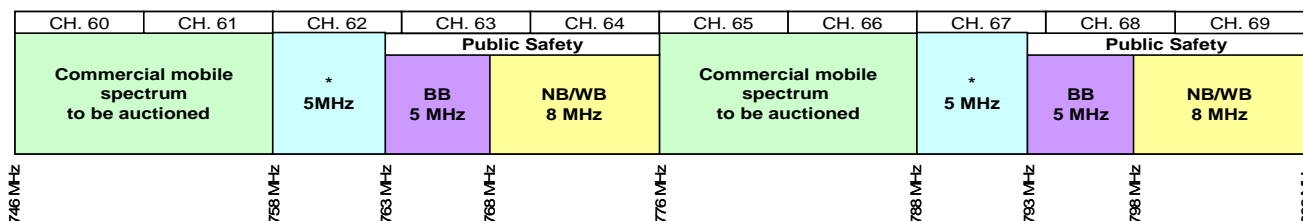
Considering that the sub-band 758-763 MHz/788-793 MHz (referred to as the “D Block”) is still under discussion in the United States regarding whether or not it will be attributed to public safety or if it will be auctioned, the Department may opt to wait until a decision is made in the United States before making a decision in Canada.

It should be noted that for all three options discussed below, no changes are proposed with respect to the sub-bands 768-776 MHz and 798-806 MHz that have already been designated for narrowband and wideband public safety use. It should be noted, however, that these 3 options would not be compatible with the APT band plan (Option 3 in Section 5.1).

**Option 1: 5 + 5 MHz designated for public safety, 5 + 5 MHz to auction**

Option 1 enables harmonization with the existing U.S. band plan by increasing the contiguous spectrum designated for public safety from 4 MHz + 4 MHz to 5 MHz + 5 MHz. With this option, the sub-bands 763-768 MHz and 793-798 MHz are designated for public safety broadband, whereas the remaining upper 700 MHz spectrum, including the spectrum that constitutes the “D Block” in the United States, is to be auctioned for commercial use, as shown in Figure 5.8. In addition, public safety agencies may be granted priority access rights over commercial systems in the sub-bands 758-763 MHz and 788-793 MHz.

**Figure 5.8 - 700 MHz Public Safety Spectrum – Option 1**



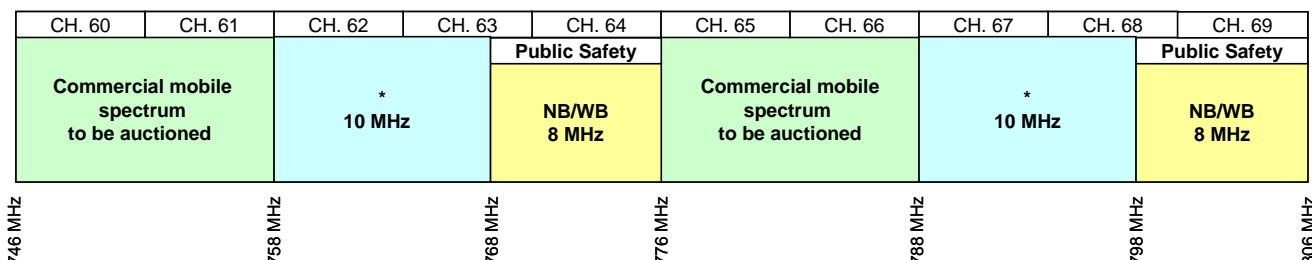
\* This block refers to the D Block, as defined in the United States.

**Option 2: 10 + 10 MHz to auction**

Option 2 reassigns the spectrum previously designated for public safety in the sub-bands 764-768 MHz and 794-798 MHz for commercial use, as shown in Figure 5.9. This spectrum provides for 10 MHz +10 MHz of contiguous spectrum for commercial operations. With Option 2, there is no 700 MHz broadband spectrum specifically dedicated for use by public safety agencies. Instead, the two blocks of spectrum (10 + 10 MHz) will be auctioned to commercial operators with possible provisions giving priority access rights to public safety agencies, such as pre-emption, and ensuring that both the

technical and interoperability (national and international) requirements specific to public safety are met. To meet these requirements, a Tier 1 (national) licensing area may be applicable for this band plan option or licensees may be obliged to agree to a single common technology standard.

**Figure 5.9 - 700 MHz Public Safety Spectrum – Option 2**

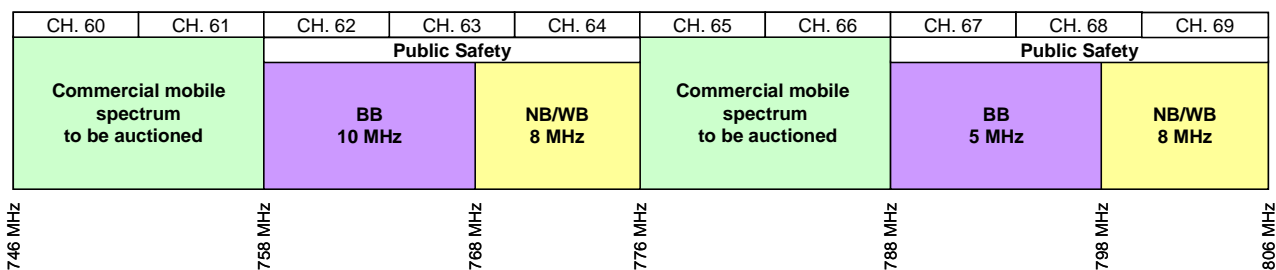


\* This block includes the D Block commercial spectrum.

**Option 3: 10 + 10 MHz designated for public safety**

Option 3 designates the spectrum that comprises the “D Block” in the United States plus the extra 1 MHz in the sub-bands 763-764 MHz and 793-794 MHz for public safety broadband use, as shown in Figure 5.10. This spectrum, combined with the already designated public safety spectrum in the sub-bands 764-768 MHz and 794-798 MHz, provides for 10 MHz +10 MHz of contiguous spectrum, i.e. 758-768 MHz and 788-798 MHz, for public safety broadband operations.

**Figure 5.10 - 700 MHz Public Safety Spectrum – Option 3**



- 5-9. If band plan Option 1, 2a, or 2b in Section 5.1 is chosen, which one of the three options described above should be adopted and why is this option preferred over the other options? Provide supporting rationale.**
- 5-10. If commercial operators are mandated to support public safety services, what tier size should be applied in order to ensure adequate public safety coverage?**
- 5-11. If the APT band plan (See Option 3 in Section 5.1) is adopted:**
- (a) **Given that the APT band plan requires a 55 MHz duplexing separation, can Canadian public safety services operate their current narrowband systems in this band plan configuration? If not, what are possible alternatives to address public safety needs?**

**(b) Should spectrum be designated for dedicated public safety broadband systems, and how much?**

**You are also invited to comment on any related aspects that are not addressed above, including whether the decision should be delayed until the U.S. situation is known.**

### **5.3 Tier Sizes for 700 MHz Auction of Commercial Spectrum**

The licences for the 700 MHz band will be established in accordance with *The Service Areas for Competitive Licensing* document,<sup>23</sup> which outlines the general service areas that are proposed for an auction. The defined geographic areas have been categorized under “service area tiers” that are based on Statistics Canada’s Census Divisions and Subdivisions. The definition of the service areas within these tiers and accompanying maps and data tables are available on Industry Canada’s website. As different wireless services and applications are best suited to different service areas, four tiers of service areas have been established. Tier 1 is a single national service area. Tier 2 consists of 14 large service areas covering all of Canada. There are eight Tier 2 service areas that have provincial/territorial boundaries, and six that are within Ontario and Quebec. Tier 3 contains 59 smaller regional service areas and Tier 4 comprises 172 localized service areas. The population associated with each service area is based on Statistics Canada census information.

In general, Tier 1 and Tier 2 licences have typically been used for mobile services, whereas Tier 3 and 4 have typically been used for licensing fixed services.

AWS spectrum was auctioned using a mixture of Tier 2 and Tier 3 areas. As was shown in Figure 5.1, the 700 MHz band was auctioned in the United States as a mix of service areas to enable deployment under a variety of business models. The smallest area used by the FCC was the Cellular Market Area (CMA), which, population-wise, is roughly equivalent to the Tier 3 service areas in Canada.

The propagation characteristics of the 700 MHz band are most conducive to high mobility applications due to low over-the-air propagation losses and feasibility of small size antennas enabling the development of personal portable communication devices.

Licensing this spectrum based on larger geographic areas would result in fewer neighbouring service providers, translating into less coordination between licensees and more effective use of radio spectrum. Moreover, large service areas could foster regional mobile services, which could reduce the number of roaming arrangements between licensees.

Larger geographic service areas would also enable efficient large-scale networks due to economies of scale. Wireless mobile networks are capital-intensive. Considerable capital and operational costs are required for items not directly related to the provision of wireless coverage in the field (research and development, network interconnection(s), operation and support systems, marketing, etc.). These costs need to be supported from services marketed to a sufficiently large subscriber base. Furthermore, a large or national footprint may be an asset when marketing high mobility services.

<sup>23</sup> Service Areas for Competitive Licensing: [http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf01627.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01627.html)

Licensing based on smaller tier sizes provides additional flexibility to bidders, who can concentrate on the geographic markets of most interest, or aggregate smaller service areas into larger regions corresponding to their business needs. This may result in potential lower costs for bidders, if the smaller markets (rural and remote areas) are unbundled from the high-density, high-revenue areas. It may also enable smaller local service providers to afford the less expensive licences and provide services in their communities.

As part of this consultation, the Department seeks comments on which tier size or combination of tier sizes should be used for auctioning the 700 MHz band.

The questions below seek comments on tier sizes specifically in relation to a respondent's preferred band plan. Comments pertaining to tier sizes as they relate to the promotion of service deployment in remote and rural areas are not considered below and should be addressed within the responses to Section 8 of this consultation.

**5-12. The Department seeks comments on whether the auction of 700 MHz commercial spectrum should be based on uniform tier sizes across all spectrum blocks, or a mixture of tier sizes.**

**5-13. Based on your answer above, what tier size(s) should be adopted?**

**Provide supporting arguments for your responses to the above questions.**

#### **5.4 Treatment of Existing Spectrum Users**

Besides over-the-air TV broadcasting, low-power devices, including wireless microphones, are currently licensed in the 700 MHz band. Full power TV broadcasting will be transitioned out of the band and new mobile broadband services will be deployed in the 700 MHz range. No decision has been made with regard to the treatment of low-power TV broadcasting which may continue to operate in the above bands following the DTV transition. Furthermore, no firm date has been established after which the use of low-power wireless devices, including wireless microphones, will be prohibited in the bands 698-764 MHz and 776-794 MHz.

The Department seeks comments on the options for the treatment of these existing users currently operating in the 698-764 MHz and 776-794 MHz bands.

#### **Low-Power Television (LPTV) Broadcasting**

In March 2010, the CRTC released *Broadcasting Regulatory Policy 2010-167* to announce its decision with regard to the analog-to-digital television broadcasting conversion. In this policy, the CRTC confirmed the deadline of August 31, 2011, for the transition of full-power analog transmitters operating in the 31 identified mandatory markets and for those operating on channels 52-69 outside the mandatory markets. The broadcasters outside the mandatory markets who choose not to convert to digital must either move their service(s) to a channel outside the 52 to 69 range or must cease operation of their analog transmitter(s).



In its decision, the CRTC did not make any provisions specific to LPTV broadcasting operations. Industry Canada is responsible for establishing the policy to accommodate these installations in the vacated TV spectrum. Following the DTV post-transition plan, approximately 60 LPTV stations will remain in the 700 MHz band, specifically in the 52-69 channel range.

Consistent with a letter sent to the CRTC in 2000,<sup>24</sup> Industry Canada indicated that, with respect to the DTV transition, “unless there are extraordinary circumstances, it will not issue broadcasting certificates for low-power TV stations in channels 60-69.” This moratorium on new broadcasting certificates for low-power TV stations remains in effect. In addition, effective immediately, no new broadcasting certificates will be issued for low power TV stations in TV channels 52-59 (698-746 MHz).

As indicated in Broadcasting Procedures and Rules Part 4 (BPR-4), *Application Procedures and Rules for Television Broadcasting Undertakings*, LPTV stations are considered as secondary assignments, on a no-interference, no-protection basis to TV stations operating on allotted channels and to other radio services. LPTV stations are only entitled to protection from other low-power stations authorized at a later date and from very low-power television stations.

The Department proposes that a transition policy for the LPTV stations be implemented based on the displacement of incumbents on a “where necessary” basis. The continued operation of existing LPTV systems in remote and rural areas will be permitted if it does not prevent the deployment of new broadband mobile systems. LPTV station licensees would be afforded a notification period before displacement following the licensing of new services in the 700 MHz band.

**Effective immediately, no new broadcasting certificates will be issued for LPTV stations in TV channels 52-59 (698-746 MHz).**

**The Department proposes that the displacement of the incumbent LPTV stations be subject to a notification period of one year for LPTV stations located in urban areas<sup>25</sup> or in specific geographic areas, such as along highway corridors; and a period of two years for LPTV stations in all other areas. A displacement notification can be issued only after technical determination is made concluding that continued operation of the incumbent LPTV station would impede the deployment of new licensed systems in the 700 MHz band.**

**5-14. The Department seeks comments on the transition policy proposed above.**

### **Low-power licensed devices, including wireless microphones**

The band 698-806 MHz has been widely used by low-power licensed radiocommunication devices, including wireless microphones, subject to licensing on a no-protection, no-interference basis. In

<sup>24</sup> Public Notice CRTC 2000-127 — Call for Comments on a Licensing Framework for Low-power Community Television Undertakings in Urban Areas, and in Other Markets Not Covered by Existing Policy (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08086.html>)

<sup>25</sup> As defined by Statistics Canada.

Spectrum Advisory Bulletin SAB-001-10,<sup>26</sup> released in January 2010, Industry Canada announced that no new licences for low-power licensed radiocommunication devices will be issued nor will the Department accept applications for certification of such devices in the band 698-806 MHz. In bands other than 764-776 MHz and 794-806 MHz, which are dedicated to public safety systems, wireless microphones were allowed to continue to operate, as per SAB-001-10.

Allowing low-power devices, including wireless microphones, to continue to operate in this band may cause interference to new commercial and possible future public safety deployments planned for this band. In the United States, the FCC is prohibiting the manufacturing, importation and sale of wireless microphones and other low-power auxiliary stations intended for use in the 700 MHz band in order to ensure that both public safety and commercial mobile licensees can operate interference-free in this band.<sup>27</sup> In Canada, implementing a similar ban on wireless microphones in the 700 MHz band will also limit the number of wireless microphones entering the country.

In addition, Radio Standards Specifications RSS-123, *Low Power Licensed Radiocommunication Devices*, and Client Procedure Circular CPC-2-1-11, *Low-power Licensed Radiocommunication Devices*, are currently under review and will be updated accordingly in order to revise the applicable equipment standards and licensing of these devices.

RSS-123 and CPC-2-1-11 will also be modified to include stopping the manufacturing, importation, distributing, leasing, offering for sale or selling of any equipment that does not comply with the applicable revised standards, in the band 698-806 MHz. This prohibition will also apply to all equipment, including equipment that has been certified to meet the former standards.

In accordance with SAB-001-10, these devices are permitted to operate in the public safety bands, 764-776 MHz and 794-806 MHz, only until March 31, 2011. The Department proposes to publish an additional Spectrum Advisory Bulletin to permit operation of these devices in the remaining bands (698-764 MHz and 776-794 MHz) only until March 31, 2012.

**5-15. The Department seeks comments regarding its proposal to permit low-power licensed devices, including wireless microphones, to operate in the band 698-764 MHz and 776-794 MHz only until March 31, 2012.**

## 6. Changes to Canadian Table of Frequency Allocations

At the 2007 World Radio Conference (WRC-07), the ITU identified additional spectrum for use by IMT systems within the 698-862 MHz UHF band and allocated this spectrum to the mobile service. More specifically, for each ITU Region,<sup>28</sup> IMT is now identified for use in:

<sup>26</sup> SAB-001-10, *Low-power Licensed Radiocommunication Devices, Including Wireless Microphones, in the Band 698-806 MHz*; (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09777.html>)

<sup>27</sup> R&O and FNPRM FCC 10-16 ([http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-10-16A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-16A1.pdf))

<sup>28</sup> Details regarding ITU regional structures are found on the ITU website (<http://www.itu.int>).

- Region 1: 790-960 MHz
- Region 2: 698-960 MHz
- Region 3: 790-960 MHz<sup>29</sup>

Internationally, portions of the UHF band are currently being used for television broadcasting in some countries. From a technical perspective, this band is of particular interest to the industry for mobile broadband services due to favourable propagation characteristics that allow for the deployment of cost-effective wide area networks and enhanced in-building coverage.

Frequency allocations are an important first step in developing spectrum utilization policies that foster the implementation of new radiocommunication services. Modifications to the *Canadian Table of Frequency Allocations* (herein referred to as the Canadian Table) are intended to reflect the public interest in introducing new wireless services that benefit Canadians and respond to marketplace demands. As a result, the Department is proposing several modifications to the Canadian Table to allow for the implementation of new mobile services in the 700 MHz band, including commercial mobile radio services.

Currently, the Canadian Table allows for the Broadcasting and Mobile services in certain portions of the 700 MHz band as follows:

**Table 5.6: Excerpt from the Canadian Table of Frequency Allocations, 2009 Edition**

614 - 746	BROADCASTING 5.293 C24
746 - 806	BROADCASTING MOBILE 5.317A C7 5.293 C22 C24

The footnotes in the Canadian Table are currently defined as follows:

**5.293** *Different category of service:* in Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-698 MHz to the mobile service is on a primary basis (see No. **5.33**), subject to agreement

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<sup>29</sup> Although 790-960 MHz was identified for IMT in Region 3, Bangladesh, China, Korea (Rep. of), India, New Zealand, Papua New Guinea, Philippines and Singapore also identified the band 698-790 MHz to align with Region 2. The frequency arrangements for the respective regions are found in the document ITU-R M.1036-2.

obtained under No. **9.21**. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. (**WRC-07**).

- 5.317A** Those parts of the band 698-960 MHz in Region 2 and the band 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). See Resolutions **224 (Rev. WRC-07)** and **749 (WRC-07)**. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (**WRC-07**).
- C7** (**CAN-09**) International Footnote **5.317A** provides administrations with the flexibility to implement International Mobile Telecommunications (IMT) in parts of the band 698-960 MHz that are allocated to the mobile service on a primary basis. For the time being, the application of **5.317A** is limited to the bands designated for cellular mobile telephony and trunked mobile systems. The bands 824-849 MHz and 869-894 MHz are designated for cellular telephony services and the bands 806-821 MHz, 851-866 MHz, 896-902 MHz and 935-941 MHz are designated for trunked mobile services and, as such, can evolve to accommodate IMT service capabilities.
- C22** (**CAN-04**) In the band 746-806 MHz, the gradual use of spectrum for the mobile service will be subject to the development of a series of spectrum utilization policies as the transition of digital television progresses.
- C24** (**CAN-04**) In the bands 470-512 MHz and 614-806 MHz, international footnote **5.293** has raised the fixed and mobile services to a co-primary status with the broadcasting service for Canada. To support broadcasting requirements during the transition to digital television, the Department is only allocating the mobile service in the band 746-806 MHz at this time. The Department will carry out public consultation in the future in order to adopt the other service allocation provisions of international footnote **5.293** in the frequency bands 470-512 MHz and 614-746 MHz.

The Department proposes to make the following changes to the Canadian Table in the band 614-806 MHz:

- modify the split between the bands 614-746 MHz and 746-806 MHz as follows: 614-698 MHz and 698-806 MHz;
- extend the co-primary mobile service allocation to include 698-746 MHz;
- add a co-primary fixed allocation for the 698-806 MHz range;
- suppress footnote C22 (**CAN-04**) given that spectrum utilization policies for this band will be developed as a result of this consultation;
- modify footnote C24 (**CAN-04**) to change the frequency range subject to a future consultation on adopting the other service provisions of **5.293** from 614-746 MHz to 614-698 MHz and to delete certain parts of the footnote pertaining to the transition to digital television; and
- extend the revised international footnote **5.317A** (Footnote C7), which allows administrations the flexibility to implement IMT in the band 698-746 MHz.

Taking into consideration the proposed changes to the band 698-806 MHz, the following modifications to the Canadian Table are proposed.

614 – <del>698</del> 746 BROADCASTING  5.293 MOD C24
<del>746-698</del> - 806 BROADCASTING <u>FIXED</u> MOBILE 5.317A MOD C7  5.293 <del>C22</del> <del>C24</del>

**SUP**

~~C22~~ (CAN-04) In the band 746-806 MHz, the gradual use of spectrum for the mobile service will be subject to the development of a series of spectrum utilization policies as the transition of digital television progresses.

**MOD**

C24 (CAN-04) In the bands 470-512 MHz and 614-806 MHz, international footnote **5.293** has raised the fixed and mobile services to a co-primary status with the broadcasting service for Canada. ~~To support broadcasting requirements during the transition to digital television, the Department is only allocating the mobile service in the band 746-806 MHz at this time.~~ The Department will carry out public consultation in the future in order to adopt the other service allocation provisions of international footnote **5.293** in the frequency bands 470-512 MHz and 614-698 MHz.

**MOD**

C7 (CAN-09) International Footnote **5.317A** provides administrations with the flexibility to implement International Mobile Telecommunications (IMT) in parts of the band 698-960 MHz that are allocated to the mobile service on a primary basis. For the time being, the application of **5.317A** is limited to the bands designated for cellular mobile radio systems ~~cellular mobile telephony and trunked mobile systems~~. The bands 698-764<sup>30</sup> MHz and 776-794<sup>29</sup> MHz, 824-849 MHz and 869-894 MHz are designated for cellular mobile radio systems ~~cellular telephony services~~ and the bands 806-821 MHz, 851-866 MHz, 896-902 MHz and 935-941 MHz are designated for trunked mobile services and, as such, can evolve to accommodate IMT service capabilities.

**6-1. The Department seeks comments on its proposed changes to the *Canadian Table of Frequency Allocations* for the band 698-806 MHz.**

<sup>30</sup> The frequencies 764 MHz and 794 MHz are subject to change pending decisions made in this consultation.

## **Spectrum Utilization Policy**

In RP-014, issued in 1995, Industry Canada clarified the definition of a cellular mobile radio service (CMRS), and placed no limitations on the types of mobile radio or personal communications applications to be deployed in the cellular mobile bands.

The Department proposes to refer to the commercial radio systems to be deployed in the 700 MHz band as Mobile Broadband Services (MBS). The MBS systems would be compliant with the RP-14 definition for CMRS. Subject to technical compatibility considerations, there will be no restrictions on the services to be offered by licensees under MBS. The 700 MHz band will be dedicated to MBS with the exception of any frequency ranges possibly designated for public safety.

**6-2. The Department seeks comments on the spectrum utilization policy proposed above.**

## **7. Promoting Competition**

### **7.1 Possible Need to Promote Competition**

As described in Section 4.1, until recently, the Canadian wireless market was comprised primarily of three large service providers, Bell, Rogers and TELUS, as well as a number of regional providers, e.g. SaskTel Mobility and of several Mobile Virtual Network Operators (MVNOs). The Department has acted to encourage a competitive telecommunications marketplace, as it believes that competition stimulates innovation and investment in the industry, which can lead to lower prices, better services and more choice for consumers and businesses.

In 2007, in pursuit of these objectives, the terms of the Advanced Wireless Services (AWS) auction included a spectrum set-aside exclusively for eligible bidders. A number of new entrants responded by acquiring this set-aside, and other spectrum. Some of these new entrants, Public Mobile, Mobilicity, Wind Mobile, Videotron and others have already launched service resulting in a more competitive wireless marketplace, but with unknown impact as of yet on consumer prices and services.

The following questions examine the need for possible measures to promote competition in the Canadian wireless services market(s).

**7-1. The Department seeks comments on the current state of competition and its anticipated evolution, including the impact on consumers in the Canadian wireless services market:**

- (a) in general;**
- (b) in terms of its contributions and interaction to the broader Canadian telecommunications service market;**
- (c) in comparison with the wireless markets of other jurisdictions.**

- 7-2. Provide views, and any supporting evidence, on the impacts of government measures adopted in the AWS auctions, including the impacts on consumers and on the state of competition. In particular, what has been the impact, if any, of such measures on industry concentration, barriers to entry or expansion of services, and the availability of new or improved service offerings and pricing plans?**
- 7-3. In light of the current conditions in the Canadian wireless service market(s), is there a need for specific measures in the 700 MHz and/or 2500 MHz auction to increase or sustain competition?**
- 7-4. The Government of Canada has undertaken a consultation on potential changes to the foreign investment restrictions<sup>31</sup> that apply to the telecommunications sector. How would the adoption of any of these proposed changes impact your responses to the questions above?**

**Provide supporting evidence and rationale for all responses.**

## **7.2 Specific Mechanisms Applicable to the 700 MHz and 2500 MHz Auctions**

Industry Canada will use an auction mechanism to award spectrum in both the 700 MHz and the 2500 MHz bands. Auctions are a transparent, fair and efficient spectrum assignment mechanism. The *Framework for Spectrum Auctions in Canada*<sup>32</sup> notes that there are various measures available in an auction to promote a competitive marketplace if required, notably spectrum caps and set-asides.

Developments in the 700 MHz and 2500 MHz bands demonstrate that both are suitable for the deployment of advanced mobile/broadband networks and services to meet growing consumer demands. In the recent consultation *DGSO-001-10 – Decisions on the Transition to Broadband Radio Service (BRS) in the Band 2500-2690 MHz and Consultation on Changes Related to the Band Plan*, it is noted that BRS comprises a wide range of applications, primarily data, multimedia, Internet Protocol (IP)-based applications and broadband Internet access using post third-generation (3G) technologies.

Those participating in the 700 MHz and 2500 MHz auctions may see a benefit in acquiring a combination of spectrum in both bands to complement existing networks and/or deploy new networks and services, whereas others may not. Consequently, the Department will consider the issue of promoting competition (discussed below) in the context of both bands. Measures involving spectrum in both the 700 MHz and 2500 MHz bands could be adopted either in a combined auction format or separately if the two auctions are conducted individually.

<sup>31</sup> For details, refer to *Opening Canada's Doors to Foreign Investment in Telecommunications: Options for Reform* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09919.html>).

<sup>32</sup> For details, refer to (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01626.html>).

## **Spectrum Aggregation Limits and Spectrum Set-Asides**

Recognizing that there are various mechanisms in an auction process that can be used to promote competition, the Department has intervened in the past by using mechanisms such as spectrum aggregation limits (spectrum caps) and spectrum set-asides to foster competition. The same options could be considered should the Department decide that specific measures are necessary to promote competition in the wireless service market.

### **Spectrum Aggregation Limits (Spectrum Caps)**

Spectrum aggregation limits (spectrum caps) restrict the amount of spectrum that any eligible bidder and its affiliates can purchase in a particular geographical region.

A spectrum cap was set for the 2001 PCS auction, effectively allowing for the entry of two new licensees. The cap had been applied to the combination of cellular (800 MHz), PCS (at 2 GHz) and other similar high-mobility radiotelephony services in the 800 MHz range, such as enhanced specialized mobile radio (ESMR), in order to ensure that new entrants had access to sufficient spectrum to effectively compete with the existing carriers. The cap was subsequently removed in 2004 due, in large part, to the opening of several other mobile bands and the convergence occurring with similar services and technologies.

Spectrum caps have also been used to prevent excessive concentration of spectrum at the time of opening new bands for competitive services. Such an aggregation limit was employed in the auction of the 2.3 GHz and 3.5 GHz bands and remained in effect for a period of two years following the close of the auction.

Setting the right cap amount is essential. If the limit is too low, there may not be enough spectrum to satisfy the business needs of some companies. If it is set too high, it might fail to fulfill the goal of preventing spectrum concentration. Another factor to be considered when applying a spectrum cap is how it should be applied, e.g. whether the cap should apply only to the spectrum being auctioned, to spectrum that is held across one or more bands, or whether it should apply differently across various bidders. How it is applied could limit the efficient allocation of the spectrum.

Possible options for implementation of a spectrum cap may include:

- (a) spectrum to be auctioned in individual bands (700 MHz separately from 2500 MHz);
- (b) a combination of spectrum to be auctioned in both bands (700 MHz and 2500 MHz); and
- (c) a combination of spectrum to be auctioned as well as existing spectrum holdings in all or a subset of bands available for commercial mobile systems (Cellular, PCS, AWS, BRS), e.g. spectrum holdings below 1 GHz.

Industry Canada recognizes that different licensed service areas for Cellular, PCS, AWS and BRS may create difficulties for the possible implementation of spectrum caps involving more than one spectrum band.



## **Spectrum Set-aside**

A spectrum set-aside occurs where eligibility to bid for a specific block is limited to entities that meet predefined criteria. A set-aside was used in the 2008 AWS auction where only new entrants, defined as participants holding less than 10% of the national wireless market, were permitted to bid on three (3) of the available eight (8) blocks of spectrum. Restrictions were also imposed to ensure that the set-aside spectrum would not be transferred to companies that did not meet the “new entrant” criterion for a period of five (5) years from the date of issuance.

A set-aside mechanism is established in the context of specific block(s) sizes and geographic dimension of the licences. Ideally, where there is more than one set-aside block, they should be side by side so that eligible bidders could acquire contiguous spectrum, both spectrally and geographically. Having a set-aside block(s) ensures that one or more designated entities will be assigned spectrum; however, qualified entities still have to bid competitively among themselves for the set-aside spectrum. The size of the set-aside is also a consideration in that it should be a sufficient amount of spectrum so that a designated entity could provide competitive services to Canadians. Restrictions on secondary market transactions and transferability on set-aside spectrum may need to be imposed for a specific time frame to limit opportunities for economic arbitrage of spectrum.

Should the Department decide to implement one of these measures, it will need to determine who should be subject to the spectrum aggregation limit or who will be eligible to access the set-aside spectrum during the auction, for example, solely the bidder, or also the bidders’ affiliates and associated entities.

The following questions seek comments as to which mechanisms could be used to promote competition. With regard to the 700 MHz band, the possible market measure decisions could be influenced by pending decisions on specific band plans (Section 5.1), on spectrum for public safety systems (see Section 5.2), tier sizes (Section 5.3) and open access requirements (Section 9).

**7-5. If the Department determines that there is a need for measures to promote competition, which of the above mechanisms would be most appropriate and why should this mechanism be considered over the other? Comments should also indicate if further restrictions should apply so that policy objectives are met, for example, over a given time period?**

**In light of your response above, and recognizing that pending decisions on the specific band plan, spectrum for public safety system, tier sizes and open access requirements could influence your response:**

- 7-6. (a) If the Department were to implement spectrum aggregation limits (caps):**
- (i) Should the cap apply to the 700 MHz band only or be broader?**
  - (ii) What should the size of the cap be?**
  - (iii) Should bidders and their affiliates or associates share the cap?**
  - (iv) How long should the cap remain in effect?**

- (b) If the Department were to implement a set-aside in the 700 MHz auction:**
- (i) Who should be entitled to bid in the set-aside block(s) and should the entitled bidders be restricted to bidding on the set-aside only?**
  - (ii) How much spectrum should be set-aside and which block(s) should be set-aside?**
  - (iii) If the set-aside were to include multiple blocks of spectrum, should they be contiguous?**
  - (iv) What restrictions should be put in place to ensure that policy objectives are met (for example, should trading of the set-aside spectrum be restricted for a given time period)?**

**7-7. Are there other mechanisms that should be considered and, if so, how should these be applied?**

**7-8. The Government of Canada has undertaken a consultation on potential changes to the foreign investment restrictions that apply to the telecommunications sector. How would the adoption of any of the proposed changes affect your responses to the questions above?**

**Provide supporting evidence and rationale for all responses.**

**Note: The possible implementation of a set-aside regarding the 2500 MHz spectrum to be auctioned will be dealt with in a separate consultation.**

## **8. Promoting Service Deployment in Rural Areas**

One of the objectives of the *Telecommunications Act* is to promote the availability of reliable and affordable telecommunications service to all regions of Canada. However, Canada's geography and widely dispersed population can render it difficult to make a business case for the deployment of advanced, innovative services in some rural and remote areas of the country. Consequently, some sparsely populated areas of the country may not have access to the advanced broadband services needed to prosper in today's digital economy.

Several government initiatives have been developed to promote and advance the availability of advanced services, or broadband connectivity in rural and remote areas.

As a component of *Canada's Economic Action Plan*, the Broadband Canada: Connecting Rural Canadians program aims to support the provision of essential broadband connectivity infrastructure to Canadians in remote and rural areas by providing an incentive to Internet service providers to extend

their networks. The program aims to extend broadband service to as many unserved and underserved Canadian households as possible. In addition, the CRTC recently approved the use of deferral accounts towards investments for deployments of broadband services in unserved communities.<sup>33</sup>

The recent *Consultation Paper on a Digital Economy Strategy for Canada* sought views on how the government can best ensure that rural and remote communities are not left behind in terms of access to advanced networks and on suggested priority areas for attention in these regions.

Industry Canada continues to seek advice and consider options for promoting deployment in rural, remote and low-density areas, both within specific auction processes, and within a broader policy context, noting that the challenges encountered in such areas can vary based on a number of factors, including geography, population density and the state of the marketplace.

Through other consultations initiated by Industry Canada, some respondents have identified access to spectrum as an impediment to the deployment of advanced services in rural areas. Since 1999, the Department has used auctions to assign spectrum in situations where spectrum demand exceeds supply. In addition to the auction process, there exist several options for stakeholders to access spectrum in rural or remote areas. For example, a spectrum licensee may apply to transfer its licence(s) in whole or in part (divisibility), in both the bandwidth and geographic dimensions. This creates an opportunity for those interested in providing service in rural areas to approach current licensees to discuss a mutually beneficial commercial arrangement for access to spectrum already licensed. There has been some secondary market activity in the PCS, 2500 and 3500 MHz bands, as well as in the 24 and 38 GHz bands in the past where the Department approved applications for licence transfers and divisions, as well as subordinate licence applications. Upon receipt of an application signed by both interested parties, the Department verifies that the licensee and transferee meet the eligibility criteria and all other conditions of licence, technical or otherwise, prior to consideration for ministerial approval. Upon approval, the necessary changes to the related licences are implemented.

Within an auction process, an opportunity exists where parties wishing to serve various rural or remote communities within a tier area can form a bidding consortium and enter the auction with the goal of obtaining a licence and then having each consortium member provide service to a portion of the licensed tier area.

In the *Consultation on the Revisions to the Framework for Spectrum Auctions in Canada and Other Related Issues*, some stakeholders provided comments in favour of the development of a smaller tier that separates rural and urban areas. They suggested that this would reduce barriers to the provision of rural

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<sup>33</sup> Telecom Decision CRTC 2010-637, Follow-up to Telecom Decision 2008-1 – Proposal by Bell Aliant Regional Communications, Limited Partnership and Bell Canada to dispose of the funds remaining in their deferral account, August 31, 2010, as amended by Telecom Decision CRTC 2010-805, Bell Canada – Applications to review and vary certain determinations in Telecom Decision 2010-637 concerning the use of high-speed packet access wireless technology and the deferral account balance, October 29, 2010;

Telecom Decision CRTC 2010-638, Follow-up to Telecom Decision 2008-1 – Proposal by MTS Allstream Inc. to dispose of the funds remaining in its deferral account, August 31, 2010; and

Telecom Decision CRTC 2010-639, Follow-up to Telecom Decision 2008-1 – Proposal by TELUS Communications Company to dispose of the funds remaining in its deferral accounts, August 31, 2010.

service. However, most argued that Tier 4 should be the smallest subdivision, further noting that smaller tier sizes would not facilitate a viable and sustainable business case and would increase the complexity of frequency coordination issues.

Another option for accessing spectrum is outlined in RP-19. This policy allows for new parties who propose services in areas that are unserved or underserved to apply for a licence for spectrum already licensed to a cellular incumbent. Where mutually agreeable arrangements cannot be established between the two parties, new parties may apply through the RP-19 process for consideration. In addition, some PCS spectrum remains available for licensing on a first-come, first-served basis.

The superior propagation characteristics of the 700 MHz spectrum band make this spectrum well suited for broadband services in rural areas. This is due in part to the cost efficiencies resulting from fewer required towers to cover a given area. In the context of this specific spectrum band, the Department is seeking views on whether a need exists to promote service deployment in rural areas. Within their responses, stakeholders may wish to comment on the feasibility of options such as roll-out licence conditions specifically targeting deployment in rural areas, as well as the use of a geographical tier structure that would divide rural areas from urban.

**8-1. In the above context, the Department seeks comments on challenges and specific problems affecting the deployment of broadband mobile services to low-density rural and remote areas.**

**8-2. Is there a need for further regulatory measures or changes to existing regulatory rules (e.g. RP-19) to facilitate service deployments in rural and remote areas that remain unserved and/or underserved?**

**8-3. Should the Department decide that measures are necessary, comments are sought on specific measures that could be adopted within the 700 MHz spectrum auction process to ensure further deployment of advanced mobile services in rural and remote areas (e.g. roll-out conditions, tier structure, etc.).**

**Rationale and supporting evidence that substantiate your responses should be provided.**

## **9. Open Access**

The next generation wireless networks (3G and 4G) are based on broadband IP connectivity. Based on the open IP standard, the new architecture enables the expansion of the wireless industry ecosystem. New participants (hardware and application developers, content providers, third party service providers) are now able to develop, market and make available a range of products and services directly to wireless end-users.

The latest generation of mobile devices include portable general use computers (smartphones, pads, notebooks, etc.) and modems to connect computers to the Internet (USB modems, embedded wireless modules, etc). Users of these advanced devices have an expectation to be able to use their mobile broadband devices with the same degree of flexibility and access as using a personal computer connected to the Internet.

Requirements for open platforms for devices and applications have been included in the FCC rules applicable to Block C (746-757/776-787 MHz) in the Upper 700 MHz band:

- *Open platforms for devices* – referring to the ability of device manufacturers to develop and of users to procure the devices of their choosing, as long as the wireless network is not negatively impacted.
- *Open platforms for applications* – referring to the ability of application developers to create and of users to download, install and use the applications of their choice, while complying with certain technical conditions related to the management of the wireless network.

Adopting an open access policy similar to that used in the United States would enable service providers and users in Canada to take advantage of economies of scale due to the larger U.S. market. Moreover, such policies could enable Canadians to participate more actively in the new digital economy as consumers, innovators and content creators.

On the other hand, recent advances in technology have already enabled more powerful end-user devices (smartphones) and more capable networks, with increased capacity and throughput speeds, which may preclude the need for such intervention. Higher capacity access to the Internet provides a platform for a wider range of applications so it is implicit that investments to increase network capacity may already benefit and reward innovative and creative ideas for applications. Furthermore, the user experience for mobile subscribers is continually improving, and users may now expect and demand additional flexibility in using a wide range of novel devices and applications. As a result, some of the open access provisions, as described above, may already be a part of the wireless industry marketplace. For example:

- users today are able to acquire handset or terminal devices within the GSM family of standards (GSM/GPRS/EDGE/HSPA) from third party retailers and then purchase wireless services from carriers with compatible networks; and
- many of the new devices currently retailed by wireless service providers are based on certain open platforms enabling flexibility in the development, distribution and use of third party developed applications.

**9-1 The Department seeks comments on whether there is a need for government intervention to promote open access, by increasing access by users to handsets and/or applications.**

**9-2. If government intervention is needed, which of the following options should be implemented?**

**Option 1: Mandated open access requirements across all future commercial mobile bands**

**Option 2: Mandated open access requirements for the entire commercial mobile spectrum in the 700 MHz band.**

**Option 3: Mandated open access requirements for the “C Block” (746-757/776-787 MHz) as in the United States.**

**Please provide supporting arguments for your responses, and any additional comments related to provisions of open platforms for devices and applications.**

## **10. Auction Timing**

In parallel with the preparatory work to auction spectrum in the 700 MHz band, the Department has also begun preparatory work towards the eventual auction of spectrum in the 2500-2690 MHz range for BRS. The most recent consultation entitled *DGSO-001-10 – Decisions on the Transition to Broadband Radio Service (BRS) in the Band 2500-2690 MHz and Consultation on Changes Related to the Band Plan*<sup>34</sup> and comments received are available on Industry Canada’s website. High-capacity broadband mobile services could be offered in this band due to its good radio propagation characteristics and the prospect of relatively low-cost equipment. The 2500-2690 MHz band is the only band identified by the ITU on a global basis for IMT next generation mobile services.

In moving forward with the implementation of auctions of the spectrum in the 700 MHz and 2500 MHz bands, the Department must consider stakeholder requirements with regard to both bands. For example, consideration of the extent to which stakeholders perceive 700 MHz and 2500 MHz spectrum to be substitutes and/or complements of each other, and the extent to which these perceptions may vary across stakeholders.

<sup>34</sup> <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09882.html>

In this regard, the Department is seeking views on the most appropriate timing for auction processes for both the 700 MHz and 2500 MHz bands.

**10-1. The Department is considering three options to proceed with the 700 MHz and 2500 MHz bands auction processes:**

**Option 1: to conduct an auction for licences in the 700 MHz band first, followed by an auction for licences in the 2500 MHz band approximately one year later;**

**Option 2: to conduct an auction for licences in the 2500 MHz band first, followed by an auction for licences in the 700 MHz band approximately one year later;**

**Option 3: to conduct one combined auction for licences in both the 700 MHz and 2500 MHz bands, which would be six months later than the first auction in the case of separate auctions.**

**Industry Canada is seeking views on the merits or disadvantages of proceeding with each of the various options stated above. The Department seeks to understand the magnitude of interdependencies between the two bands from a business/operational perspective. Specifically, comments are sought as to the extent spectrum in these bands is interchangeable or complementary from both a technological and a strategic perspective. In addition, views on the business and financial capabilities of participating in a joint auction for both bands are sought. Comments should include the rationale for selecting one option rather than another.**

## **11. Next Steps**

Following a decision on the questions raised in this consultation paper, including a possible joint auction of the 700 MHz and 2500 MHz spectrum, Industry Canada will initiate a consultation on the licensing framework for the auctioning of this spectrum. This will include, but will not be limited to:

- (1) auction design, rules and attributes;
- (2) discussion regarding opening bids;
- (3) implementation details of government intervention to enhance competition, if applicable; and
- (4) licence conditions.

## **12. Submitting Comments**

Respondents are requested to provide their comments in electronic format (WordPerfect, Microsoft Word or Adobe PDF) to the following e-mail address: [Spectrum.Engineering@ic.gc.ca](mailto:Spectrum.Engineering@ic.gc.ca), along with a note specifying the software, version number and operating system used.

In addition, respondents are asked to number their paragraphs for ease of referencing. Submissions should also include an executive summary using a standardized report format (maximum 5 pages, double-spaced, in 12-point font).

Written submissions should be addressed to Manager, Mobile Technology and Services, DGEPS, Industry Canada, 300 Slater Street, Ottawa, Ontario K1A 0C8.

All submissions should cite the *Canada Gazette*, Part I, the publication date, the title and the notice reference number (SMSE-018-10). Parties should submit their comments no later than February 28, 2011, to ensure consideration. After the close of the comment period, all comments received will be posted on Industry Canada's Spectrum Management and Telecommunications website at <http://www.ic.gc.ca/spectrum>.

The Department will also provide interested parties with the opportunity to reply to comments from other parties. Reply comments will be accepted until March 30, 2011.

Following the initial comment period, the Department may, at its discretion, if needed to clarify significant positions or new proposals request additional information. In such a case, the reply comment deadline would be extended.

### **13. Obtaining Copies**

All spectrum-related documents referred to in this paper are available on the Spectrum Management and Telecommunications website at [www.ic.gc.ca/spectrum](http://www.ic.gc.ca/spectrum).

For further information concerning the process outlined in this document or related matters, contact:

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