



To: Manager, Mobile Technology and Services, DGEPS, Industry Canada,
300 Slater Street, Ottawa, Ontario, K1A 0C8

By email: spectrum.engineering@ic.gc.ca

RE: Canada Gazette, Part I, Gazette Notice SMSE-018-10 dated November 30, 2010 and entitled "Consultation on a Policy and Technical Framework for the 700 MHz Band and Aspects Related to Commercial Mobile Spectrum"

Ericsson Canada is pleased to submit its comments to Industry Canada's Gazette Notice SMSE-018-10 "Consultation on a Policy and Technical Framework for the 700 MHz Band and Aspects Related to Commercial Mobile Spectrum" ("Consultation").

Ericsson is a world-leading provider of telecoms equipment and related services to mobile and fixed network operators globally. Ericsson Canada, with almost 60 years of existence and more than 2700 employees in many Canadian cities, serves Canadian customers by providing professional services, broadband and multimedia solutions and network infrastructure. In addition, Ericsson Canada is directly and indirectly involved with many collaborative projects with Canadian universities and research institutions. Ericsson Canada also fulfills worldwide mandates in R&D, testing and support of wireless networks and multimedia services.

In 2010, in addition to establishing a market leadership delivering its Long Term Evolution (LTE)/Evolved Packet Core (EPC) solutions to sixteen networks in eleven countries on three continents¹, Ericsson has partnered with Motorola Solutions, the world leader in mission critical public safety communications, to build the advanced broadband communications platform based on LTE demanded by Public Safety with real-time information sharing between an integrated multimedia command center and field forces, through a collaborative portfolio of rugged radios, in-vehicle terminals and handheld LTE data devices².

Ericsson Canada actively participated in the preparation of the RABC's (Radio Advisory Board of Canada) response to this Consultation Paper and endorses the RABC's position to adopt Option 1 harmonizing with the U.S. band plan. In this submission, Ericsson will provide additional details and emphasis on a number of technical issues related to the band plan.

We trust that you will find these comments to be of value and as always, we are ready to work with Industry Canada in the future on topics related to this very important frequency band.

Sincerely,
Viet Nguyen
Director, Regulatory and Government Relations

1 Fourth Quarter Result Report: <http://www.ericsson.com/res/investors/docs/q-reports/2010/12month10-en.pdf>
2 Press release: <http://www.ericsson.com/thecompany/press/releases/2010/09/1443016>



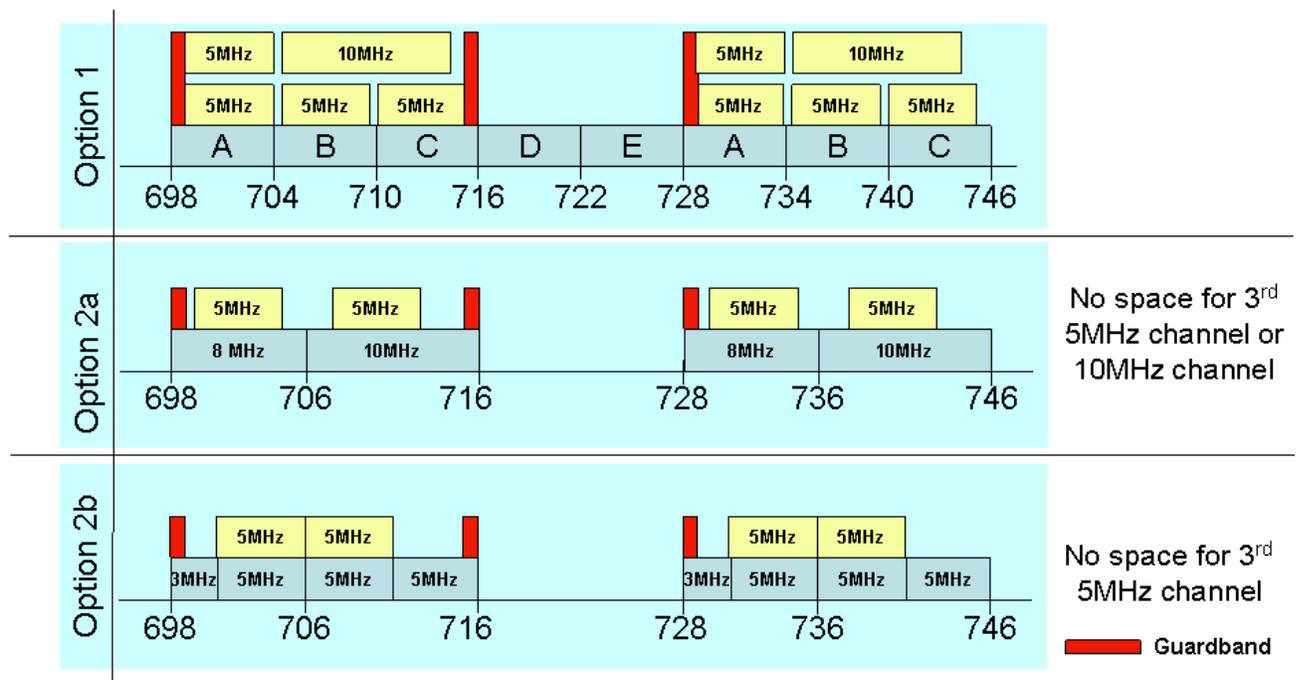
RESPONSES TO SPECIFIC QUESTIONS

Question 5.1: Based on the criteria listed above, which of the four band plan options should be adopted in Canada? Why is this option preferred over the other options?

Ericsson strongly supports RABC’s recommendation to adopt Option 1 harmonizing with the U.S. band plan based on the following reasons, which are also described in the details in the RABC’s submission:

- Equipment ecosystems: Even though the relevant 3GPP standards support various bandwidths from 1.4 MHz to 20 MHz, it is likely that 700 MHz handset and infrastructure manufacturers will first develop products consistent with the larger U.S. market using 5 MHz and 10 MHz bandwidths. Manufacturers may not develop specific equipment solely for the Canadian market using 1.4 MHz and 3 MHz channel bandwidths unless it represented sufficient scale. Therefore, even if it is technically possible, Canadian specific channel bandwidths of 1.4 MHz and 3 MHz variants would likely increase equipment cost and delay availability.

FIGURE 1: Spectrum Efficiency For Option 1, 2a and 2b





- Spectrum efficiency: In practical implementations where channel bandwidth of 5 MHz and 10 MHz are most likely used, the amount of spectrum that is utilized with Option 2a and 2b would be reduced to 10 MHz across the frequencies 698-716 MHz (18 MHz). In contrast Option 1 has a usable spectrum of 15 MHz in the same frequencies (18 MHz) as shown in Figure 1 above.

Question 5.2: The band plans presented in the options above include guardbands. Should the Department auction the guardbands, or should these frequencies be held in reserve for future use such that they are technically compatible with services in the adjacent bands?

Ericsson Canada also supports RABC's recommendation that Industry Canada should keep step with the U.S. band plan, including guard bands. This is not only to avoid detrimental differences between U.S. and Canadian band plan which would necessitate Canadian specific equipment but also to avoid potential misalignment with the U.S. band plan due to potential introductions of new rules, new commercial arrangements or new usage for the spectrum in the band. Future decision will also need to take into consideration of existing policies and standards such as Standard Radio System Plans (SRSP) 511 Issue 2, dated April 2010.

Ericsson notes that, even though FCC's technical rules for block D and E in the lower 700 MHz band allow high power mobile broadcast services in these blocks. It is not certain for what services these blocks will be used for in commercial implementation. However, regardless how these block D and E are used³, we believe that potential interference from the D and E blocks onto the neighbouring C and A blocks has to be taken into consideration most likely with guardbands which have been reflected in Figure 1. Additional details will be discussed in later in this document.

Question 5.4: Comments are sought on the need for public safety broadband radio systems to be interoperable. (a) between various Canadian public safety agencies (b) between Canadian and U.S. public safety agencies

In January 2011, FCC issued an Order and Further Notice of Proposed Rulemaking (FNPRM) which "requires all 700 MHz public safety mobile broadband networks to use a common air interface, specifically Long Term Evolution (LTE), to support roaming and interoperable communications and seeks comment on additional rules to enable nationwide interoperability"⁴. Therefore, Ericsson supports RABC's recommendation that Canada take the same step in adopting a common air interface using LTE for an Interoperable Broadband Public Safety network. This is to facilitate interoperability between public safety broadband systems within Canada and between U.S. and Canada.

³ for high power mobile broadcast services, or as additional capacity for Frequency Division Duplex (FDD) access or for Time Division Duplex (TDD) access for mobile broadband services

⁴ FCC press release: http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0125/DOC-304244A1.pdf



Question 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

Spectrum harmonization in the 700 MHz between Canada and the U.S. is especially important to ensure that the economies of scale and favorable timeframes for equipment availability can be realized in Canada. Therefore, Ericsson recommends that Industry Canada defer its consideration, decision and licensing of D block spectrum until the situation in the U.S. has been resolved. Only when the U.S. decision is finalized, Ericsson recommends that Industry Canada harmonize with the U.S. to take advantage of equipment availability and economies of scale.

Question 6.1: The Department seeks comments on its proposed changes to the Canadian Table of Frequency Allocations for the band 698-806 MHz

Ericsson supports Industry Canada's proposed changes to the Canadian Table of Frequency Allocations for the band 698-806 MHz.

Question 6.2: The Department seeks comments on the spectrum utilization policy proposed above.

Ericsson supports Industry Canada's proposal regarding MBS designation.

ADDITIONAL TECHNICAL DISCUSSIONS

While creation of the necessary Standard Radio System Plans (SRSP) and Radio Standards Specifications (RSS) is a future task, Ericsson recommends a number of technical service rules be adopted:

- Emissions limits for the commercial systems and perhaps including Broadband Public Safety (BB PS) systems⁵ but excluding the Narrow Band Public Safety (NB PS) systems in the 700MHz bands should be similar to those in other bands e.g. cellular, PCS, AWS. Therefore the Base transmit output power to be limited to 1 kW/MHz ERP (2kW/MHz ERP rural) and mobile stations be limited to 3W ERP
- The U.S. band plan does not specifically specify the duplex direction for the commercial spectrum blocks in 700 MHz; however relevant standardization bodies have taken into consideration the detailed technical constraints and have made adjustment such as the reversed duplex direction for Band 13 (in the upper C block).

⁵ It is assumed that BB PS Systems will be based on LTE therefore same technical rules are applied for BB PS. Guardbands between BB PS and commercial systems may be required if that is not the case.



- Future SRSP and RSS standards should be compliant with Category A limits within 3GPP TS 36.101 v9.6.0 and TS 36.104 v9.6.0 and out-of band emissions should be compliant with 3GPP TS 36.101 v9.6.0 and TS 36.104 v9.6.0.

Ericsson notes that the Consultation identifies two potential interference concerns: from TV channel 51 into any new system operating above 698 MHz, and also from services in the 716-728 MHz portion into the adjacent bands above and into the adjacent bands below.

Potential interference from TV channel 51:

Recent 3GPP action has re-defined the Band 12 channel bandwidth to be 699-704/729-734 MHz to create a guardband to help alleviate sources of interference. However it is likely that the use of expensive filtering or introduction of coverage restrictions or both will still be needed in proximity to channel 51 TV stations. Taking into consideration the Canadian market conditions, regulations and incumbencies, Ericsson recommends that the use TV channel 51 should be minimized where possible. We note that any Channel 51 TV Broadcasting use within the U.S that is close to the border areas could also impact Canadian use.

Potential interference from services in the 716-728 MHz into the adjacent bands above and below this band:

Caution is necessary when considering these bands as there are likely to be requirements for additional deployment, coverage constraints or for significant guardbands on one or both band edges at 716 MHz and 728 MHz.

Proximity to the US may incur significant interference in Canada at both 716 MHz and 728 MHz as deployments within the US are currently in flux. FCC's current technical rules for these bands in the U.S. allow transmit output power up to 50kW ERP/6MHz.

Even though FCC's technical rules for block D and E in the lower 700 MHz band allow high power mobile broadcast services in these blocks, it is not certain how these blocks will be used in commercial implementation. Regardless, how block D and E are used, we believe that potential interference from the D and E blocks onto the neighbouring C and A blocks has to be taken into consideration most likely with guardbands as indicated in the following examples.

- If the D and E blocks will be used for basestation transmit paired with uplink spectrum in other commercial mobile bands, then likely no guard band at 728 MHz would be needed, but a guard band at 716 MHz would be required to mitigate potential interference onto the 710-716 MHz FDD base receiver.
- However if these blocks will be used as a mobile station, then the reverse would be true, meaning no guard would be needed at 716 MHz but a guard band at 728 MHz would be required to mitigate potential interference from the 728-734 MHz base transmitter



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- Lastly, if this 716-728 MHz block is allocated as unpaired spectrum, and used for TDD, then it is likely that the TDD system would experience interference from the 728-734 MHz FDD base transmitter, and also that the 710-716 MHz FDD base receiver would experience significant interference from the TDD system. In this scenario, guardbands will be required at both block edges at 716 MHz and 728 MHz.

We note that prior studies⁶ have suggested that to minimize constraints or deployment and coverage restrictions a minimum of 5MHz guard band is needed between systems with opposite upstream/downstream directionality or between FDD and TDD systems.

===== END OF DOCUMENT =====

⁶ CEPT Report 19 -
<http://www.eroocdb.dk/doks/filedownload.aspx?fileid=3451&fileurl=http://www.eroocdb.dk/Docs/doc98/official/pdf/CEPTREP019.PDF>