

February 28, 2011

VIA E-MAIL

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

Re: Comments of Alcatel-Lucent, Consultation on a Policy and Technical Framework for the 700 MHz Band and Aspects Related to Commercial Mobile Spectrum, Canada Gazette, Part 1, December 4, 2010, Reference Number, SMSE-018-10

Dear Sir or Madame:

Alcatel-Lucent is pleased to submit the attached comments in response to the above-captioned consultation.

If you have any questions concerning this submission, please do not hesitate to contact the undersigned. Thank you for your consideration in this matter.

Sincerely,



Alex Giosa
President
Alcatel-Lucent Canada Inc.

Attachment

Comments of Alcatel-Lucent

Consultation on a Policy and Technical Framework for the 700 MHz Band and Aspects Related to Commercial Mobile Spectrum Canada Gazette, Part 1, December 4, 2010, Reference Number, SMSE-018-10

February 28, 2011

1. Alcatel-Lucent (“ALU”) respectfully submits these comments in response to Industry Canada’s consultation on a policy and technical framework to auction spectrum in the 700 MHz band (the “Consultation”).

I. EXECUTIVE SUMMARY

2. ALU applauds Industry Canada’s efforts to make additional spectrum available to ensure the provision of new, advanced and affordable telecommunications services in all regions of the country.

3. Technological innovation and resulting changes in consumer expectations are fueling an increased need for wireless spectrum. To meet this growing demand most effectively, ALU supports Option 1 as set forth in the Consultation – harmonize the Canadian band plan with the U.S. band plan – as the best path forward for Canada. By choosing Option 1, the Canadian market will benefit from economies of scale with the U.S. market. Option 1 also would best mitigate cross-border interference issues and facilitate interoperability among Canadian and U.S. public safety agencies.

4. ALU recommends that Industry Canada provide dedicated 700 MHz spectrum to build a nationwide, interoperable public safety broadband network. The quickest, most efficient way to achieve this is by harmonizing spectrum allocations for the Canadian public safety

network with U.S. spectrum allocations for public safety. Moreover, Industry Canada should mandate Long Term Evolution (“LTE”) as the common air interface for use in the public safety network, to facilitate interoperability and roaming of all public safety personnel.

5. As a final matter, ALU proposes that Low Power Television (“LPTV”) and low-powered licensed devices be relocated out of the 700 MHz band, and that changes to the Canadian Table of Frequency Allocations preclude the interleaving of high-power broadcast operations with mobile cellular operations.

II. ABOUT ALCATEL-LUCENT

6. ALU is the trusted transformation partner of service providers, enterprises, and strategic industries worldwide, providing solutions to deliver voice, data and video communications services to end-users. A leader in fixed, mobile and converged broadband networking, IP and optics technologies, applications and services, ALU leverages the unrivaled technical and scientific expertise of Bell Labs, a leading innovator in the communications industry. The following products represent some of ALU’s technological breakthroughs in 2010, alone:

- lightRadio™ – a groundbreaking antenna, capable of 2G, 3G, and 4G, small enough to fit in your hand, that promises to radically streamline and simplify mobile networks;
- 100G optical transmission – 100 Gigabit per second optical transmission and IP routing; and
- DSL Phantom Mode – boosts the transmission speeds of copper DSL by 50%.

7. With operations in more than 130 countries and the most experienced global services organization in the industry, ALU is a local partner with a global reach. In Canada, ALU employs over 3,300 people and invests over \$230M annually in telecommunications

research and development. ALU's presence in Canada has contributed to its position as a world leader in emerging telecommunications technologies.

III. RESPONSE TO SPECIFIC TOPICS RAISED IN THE CONSULTATION

A. What is the general need for additional commercial mobile spectrum at this time and what do you anticipate future needs to be?

8. The need for additional commercial mobile spectrum has grown substantially as more communications devices capable of supporting increasingly data-rich applications are used by consumers, enterprises, public safety agencies, and others. Based on ALU's field experience and analysis of network traffic in its customers' networks across the world, ALU expects continued, robust growth in wireless data traffic in the next 5 years fueled by the following macro-trends:

- Ongoing displacement of traditional wireless handheld feature phones by smarter and more powerful phones;
- Continued growth of wireless-enabled tablet or portable computers; and
- Growth in networked consumer devices (*e.g.*, e-readers) and other machine-to-machine devices.
- Change in people's behavior (*i.e.*, the boom in social networks).

9. Industry analysts project that between 2009 and 2014, mobile data traffic demand would explode by at least 350% given that average traffic demand per user has already jumped by 450% between Q1 2009 and Q2 2010.¹ Indeed, when analyzing traffic data, and accounting for denser networks and expected spectral efficiencies, the U.S. National Broadband Plan analysts concluded there will be a spectrum shortage within a 5-year window. Additionally, the

¹ See "Mobile Broadband: The Benefits of Additional Spectrum," available at <http://www.broadband.gov/plan/broadband-working-reports-technical-papers.html>.

growth in wireless data traffic has led to increased demand for larger, contiguous blocks of spectrum.

10. Supporting both the high user data rates required by video and other high data rate applications and supporting high per-user traffic volumes requires the deployment of spectrally-efficient wireless broadband technologies. LTE has been adopted by commercial service providers globally as the wireless broadband technology of choice. Achieving high data rates and spectral efficiencies on LTE requires a minimum channel bandwidth of 2x5 MHz. Larger channel sizes are preferable, with many service providers opting for deployments in 2x10 MHz to support even higher user data rates and base station capacities.

B. Which of the four band plan options should be adopted in Canada?

11. ALU recommends that Canada adopt Option 1: harmonize the Canadian band plan with the U.S. band plan. While each of the proposed options have positives and negatives, using existing 3GPP operating bands is most desirable, as it will allow Canadian consumers to benefit from economies of scale created by other markets. In addition, use by Canada of those bands will facilitate cross-border interference coordination with the U.S., as well as permitting cross-border interoperability of U.S.-Canadian public-safety and national security personnel. For these reasons, Option 1 should be adopted by Canada.

12. The remaining band plan proposals in the Consultation fail to offer the benefits of Option 1. Options 1, 2a and 2b each results in equivalent spectrum utilization, with 4 MHz as designated guard-bands but with different number of licensable paired blocks. Further, while the Consultation recognizes potential interference from DTV stations into the lower 700 MHz blocks, no guardband is reserved right above 698 MHz. The three Options will benefit from the

availability of Band 12, Band 17, Band 13 and Band 14 equipment and devices. In sum, Options 1, 2a and 2b have many similarities since they all are variants of the U.S. band plan. As the Consultation recognizes, however, Options 2a or 2b would add substantial complexity to frequency coordination at the border compared with Option 1, be it for commercial services or public safety services. Therefore, Option 1 is recommended over those other options.

13. Option 3 would be particularly problematic in that it does not align at all with the U.S. band plan. While Option 3 has some merit with respect to spectral efficiency, adoption of Option 3 by Canada would cause substantial issues with respect to frequency coordination for both commercial and public safety systems. Moreover, implementation of Option 3 could lead to interference issues with adjacent LMR services above 806 MHz. Therefore, Option 3 is not favored.

C. Do public safety agencies need spectrum for broadband applications? If so, how much and for which type of applications?

14. Canadian public safety agencies need dedicated 700 MHz spectrum space, as it would significantly advance the cause of public safety by providing first responders with access to a public safety broadband network. The quickest, most efficient approach to achieving this much-needed public safety network in Canada is through use of the U.S. band plan, Option 1. By harmonizing with the U.S., a Canadian public safety network will be advantaged by economies of scale, to the ultimate benefit of the Canadian market, as roll out of public safety broadband networks is occurring today in the U.S. This will ensure that a Canadian public safety broadband network benefits from access to network equipment, devices, and applications at lower price points than would otherwise be available. In addition, ALU agrees that adoption of

the U.S. band plan will enable roaming, frequency coordination and allow for coordination procedures with the U.S. in the 700 MHz band.

15. A public safety broadband network will allow first responders to exchange mission-critical information in real-time, anytime, anywhere. Distribution of images (floor plans, mug shots, incident stills), videos (surveillance feeds, on-scene video), messaging, and access to incident management databases provide a common operating picture and access to information from the field, enhancing both incident response and first responder safety.

Furthermore, broadband networks will allow for the secure, easy and interoperable sharing of information (voice, video and multi-media data) among members of a task force.

16. A public safety broadband network will support applications that currently cannot be supported over existing narrowband or wideband wireless data technologies. Tasks that require the consumption of substantial time to communicate between dispatchers and other officers on narrowband voice systems (*e.g.*, database lookups and dispatch messaging) could be off-loaded to broadband spectrum, significantly reducing narrowband channel load. In addition, allowing police officers, for example, to have remote access to databases (*e.g.*, license plate information, warrants, missing persons and stolen vehicle databases, etc.), remote form entry and reporting and web access will enhance public safety by increasing officer efficiency, reducing paperwork and allow officers to spend more of their time on patrol.

17. Allocating an additional 2 MHz of spectrum, 763-764/793-794 MHz, and combining the current A-block would create a single broadband block at 763-768/793-798 MHz. This would allow for the use of broadband applications on the network, as specified by the 3GPP standard for Band Class 14. In order to benefit from spectral efficiencies of today's broadband technologies, we recommend the use of the full 5 MHz minimum channel width. To

accommodate the 5 MHz minimum channel width, a sufficient amount of guard-band will be needed to protect from potential interference from planned narrowband/wideband adjacent services. ALU recommends that the block 768-769/798-799 should be reserved for such use. This would further align the Canadian band plan with the U.S. band plan.

D. 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.

18. (a) In order to achieve interoperability among public safety agencies, there must be a common technology platform. This requires the use of a common air interface to be used on the public safety broadband network. The U.S. Federal Communications Commission (“FCC”) recently mandated that the public safety air interface would be LTE. Specifically, the FCC required “that all networks deployed in the 700 MHz public safety broadband spectrum adopt LTE, specifically at least 3GPP Standard E-UTRA Release 8 and associated Evolved Packet Core.”²

19. The FCC predicated its decision on the strong consensus from public safety and the commercial roll out of LTE in the U.S. marketplace. Industry Canada should likewise mandate LTE as the common air interface for the reasons stated above, and taking advantage of the considerable economies of scale already under way in the U.S. market. By choosing LTE as the common air interface, Industry Canada will begin to ensure public safety interoperability and the cross border enablement of roaming and frequency coordination with the U.S.

² See *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Amendment of Part 90 of the Commission’s Rules*, WT Docket No. 06-150, PS Docket No. 06-229, WP Docket No. 07-100, Third Report and Order and Fourth Further Notice of Proposed Rulemaking, FCC 11-6 at ¶10 (rel. Jan. 26, 2011).

20. (b) Consistent with harmonization with the U.S. Band Plan, ALU recommends that Industry Canada defer its decision on the 758-763/788-793 MHz block, referred to as the “Upper D-block” in the U.S., which remains subject to regulatory and legislative proceedings in the U.S. Pending a decision on disposition of the Upper D-block, coordination between Canadian and U.S. public safety agencies can take different forms. If the Canadian public safety broadband block is limited to a 5 MHz channel, ALU respectfully submits that routine measures used in bordering licensed markets would adequately suffice. For example, Canadian and U.S. users could mitigate cross-border interference by limiting power flux density.

21. The current bilateral agreement on public safety spectrum along the Canadian-U.S. border essentially assigns half of the spectrum for primary use to each respective jurisdiction within a few miles of the border, and full use of the spectrum by either country’s public safety agencies farther from the border.³ Therefore, in the event public safety is assigned an additional 5 MHz,⁴ coordination would require assigning each of the 5 MHz blocks to either country for primary use along the border. Away from the border, full spectrum would be available to either country.

³ See Sharing Arrangement between the Department of Industry Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 764 to 776 MHz and 794 to 806 MHz by the Land Mobile Service Along the Canada-United States Border, June 2005, available at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/public-safety-arrang-g-e.pdf/\\$FILE/public-safety-arrang-g-e.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/public-safety-arrang-g-e.pdf/$FILE/public-safety-arrang-g-e.pdf).

⁴ There is the potential in the U.S. for an additional 10 MHz allocation for public safety, 758-763/788-793 MHz. This proposed additional 10 MHz D-block allocation is in Band 14 adjacent to the dedicated public safety spectrum space. Use of this spectrum would allow U.S. public safety to utilize the whole band 758-768/788-798, as either a single 10 MHz channel or two 5 MHz channels. See “President Obama Details Plan to Win the Future through Expanded Wireless Access,” Office of the Press Secretary The White House, Press Release (Feb. 10, 2011) (proposing funding to support a nationwide, interoperable public safety network); see also, e.g., Public Safety Spectrum and Wireless Innovation Act, S. 28, (rel. Jan.25, 2011) (proposed legislation to fund a U.S. nationwide public safety network).

E. 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.

22. ALU urges that Industry Canada adopt a holistic technical approach in order to achieve a dedicated national interoperable broadband network. Such an approach will avoid the intricacies of cross-jurisdictional roaming and PLMN assignments, and would benefit from advanced interference management techniques more suitable to single systems. For example, LTE offers a set of techniques that require exchange of signaling messages between radio sites to improve on resources scheduling, and, hence, improve quality of service. These techniques will not be practical in uncoordinated systems. Establishing a single approach for all public safety agencies also represents the most cost-effective option and, if needed, still allows individual jurisdictions to essentially have primary use of the public safety network when within their jurisdiction's radio footprint.

F. The proposed transition policy for LPTV stations.

23. In ALU's experience in the U.S. with relocation of LPTV stations (and other broadcast stations), especially during the deployment of a 700 MHz public safety system, it is best to relocate LPTV services as quickly as possible. As suggested for DTV 51, LPTV stations should be licensed well below 698 MHz. Signals emitted by LPTV transmitters are too strong to be mitigated by either user devices or network infrastructure. No wireless system can operate with in-band interference with the only exception being frequency reuse within a single system, such as LTE, which can leverage interference mitigation techniques developed for the purpose. For any spectrum block being auctioned, Industry Canada should guarantee spectrum clearance prior to equipment installation.

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

24. Wireless microphones, whether licensed or unlicensed, are a large source of uplink interference. ALU experienced the negative impact of this interference in an early 700 MHz deployment in the U.S. Allowing these devices to remain in the band until March 31, 2012 is probably reasonable given the DTV migration date and future deployment timelines. That said, the sooner their relocation, the better.

25. Allowing for high-power broadcast operations interleaved with (typically) lower-power mobile cellular operations will result in poor utilization of the spectrum in view of guardband requirements, unless broadcast transmitter power emission limits and cellular system receiver selectivity are reasonable. For example, FCC rules on unpaired blocks in lower 700 MHz, which allow for up to 50 KW ERP, require a few MHz of guardband on the adjacent commercial block.