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M/A-COM

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Via Courier and Electronic Submission

Director, Spectrum and Radio Policy
Telecommunications Policy Branch
Industry Canada, 1604A
300 Slater Street
Ottawa, Ontario, K1A 0C8

Re: Department of Industry Radiocommunication Act Notice No. DGTP-005-05 — Proposed Spectrum Utilization Policy, Technical and Licensing Requirements for Broadband Public Safety in the Band 4 940-4 990 MHz Intent

Dear Sir:

M/A-COM welcomes the opportunity to submit its comments with respect to Industry Canada's proposals to introduce public safety services in the band 4 940-4 990 MHz.

By way of background, M/A-COM is a leading technology developer and manufacturer of radiofrequency ("RF"), microwave, and millimeter wave semiconductors, components, and technologies serving the public safety and critical infrastructure, broadband, wireless data, aerospace, defense, and automotive market segments. M/A-COM has long been an industry leader in providing advanced two-way land mobile products and systems to the public safety, including wide area data products and broadband wireless data products. M/A-COM is also a pioneer in the development of Internet protocol ("IP")-based networks for private radio applications, and supplies industry-leading brands as EDACS®, OpenSky® and ProVoice™. M/A-COM is part of Tyco Electronics, one of the world's leading suppliers of electronic components.

Prior to providing its comments below, M/A-COM would like to underscore its support for ITU-R Report M.2033 "Radiocommunications objectives and requirements for public protection and disaster relief" and Resolution 646 (WRC-03) "Public protection and disaster relief" (PPDR). Both the Report M.2033 and Recommendation 646 are referenced in the Department's *Notice*. M/A-COM particularly supports Resolution 646 in its call for considering the 4940-4990 MHz band as a regionally harmonized band for ITU Regions 2 and 3 which include the Americas and Asia Pacific.

1. Spectrum Utilization

The Department seeks comments on the following questions: What types of public safety applications are foreseen to be deployed in Canada in the near future? Are there requirements for aeronautical mobile use in the band 4 940-4 950 MHz in Canada? If yes, for what purpose?

M/A-COM supports the Department's view that "this band will be able to support a variety of public safety applications if sufficient flexibility is offered such that users can customize operations of the band to suit their individual needs." Also, M/A-COM largely shares the Department's views with respect to which public safety broadband applications are most likely to be deployed in the band.

At the same time, M/A-COM would like clarify certain points raised by the Department's Notice relating to the use of the 4.9 GHz band for fixed operations. In its *Notice*, the Department states that a potential application for the band will be "**traditional**, fixed point-to-point and point-to-multipoint microwave operations, **ancillary** to public safety mobile operations to support backhaul or backbone communication links for public safety services" [emphasis added]. M/A-COM submits that in the 4.9 GHz band the use of the terms "traditional" and "ancillary" may create regulatory uncertainty and therefore should be clarified.

Firstly, point-to-point and point-to-multipoint fixed links contemplated for 4.9 GHz broadband network architectures, such as those exemplified in Figure 1 (below), are an integrated part of a public safety network based on a combination of fixed and mobile services. In particular, suppliers have sought to achieve network scalability through the use of dynamic traffic routing whereby a given traffic load might be routed to its final destination over mobile or fixed links or both. Dynamic routing envisions both peer-to-peer communications (mobile-to-mobile and fixed point-to-point) as well as point-to-multipoint communications and can be particularly advantageous in critical situations where mobile or fixed links fail due to exogenous or endogenous events. Accordingly, from a marketplace perspective, suppliers and operators have been focusing far less on the mobile or fixed nature of these broadband links, and instead on network level issues such as network capacity and the mission critical need to deliver communications to a given destination. By allowing for a combination of fixed and mobile links, maximum flexibility is provided to user and the network can dynamically provide the connectivity required for a given incident. Given the above discussion, the Department should clarify that the fixed links envisioned for public safety network architectures in this band are not traditional and furthermore that they will be accorded similar regulatory treatment to the integrated mobile elements of these networks.

Secondly, it is not clear whether through the use of the term "ancillary" the Department was suggesting that fixed operations might be treated differently from a regulatory point of view. Perhaps, the term "ancillary" simply implies that the licensing regime will fall under the mobile service.¹ However, in the event that there may be a regulatory distinction with respect to fixed and mobile operations in the 4.9 GHz band, M/A-COM submits that there should be no such distinction.

M/A-COM believes that the foregoing clarifications are consistent with the Department's view that "[a]llowing users to customize operations of the band to suit their individual needs yields optimal user flexibility as well as spectrum efficiency.

¹ Note, in Canada, under the mobile service, both fixed stations and mobile stations can be authorized. So, the discussion re "ancillary" may simply be a reflection of this framework.

Figure 1: Example of a “Converged” Broadband Architecture in the 4.9 GHz Band

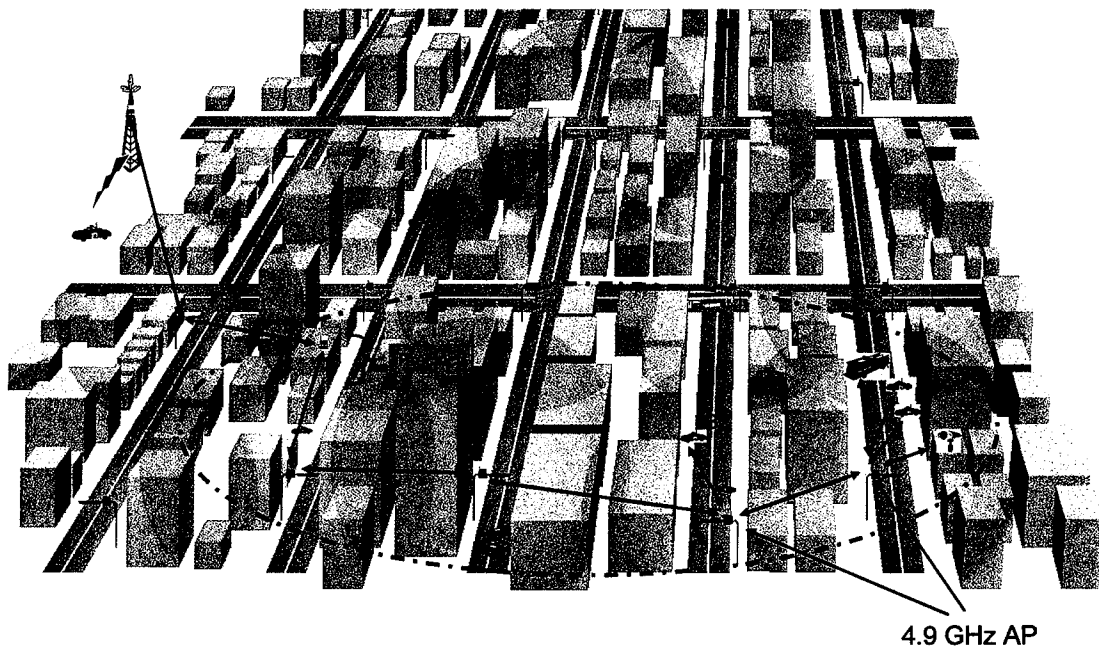


Figure 1

In Figure 1, 4.9 GHz hot-spots are placed on traffic lights to provide broadband connectivity to users, such as those in the scene of an incident in the lower right hand corner. By allowing the hot spots to communicate with other hot spots through fixed links, it is possible to expand the communications capabilities to and from the incident, including users outside the range of the first hot-spot, i.e., police car B. Moreover, by allowing these messages to “hop” along a meshed grid of access points using fixed links, the network allows users at the scene of the incident to connect back to the precinct.

2. System Applications

While the Department prefers and encourages the use of “smart” technologies in this band, comment is sought as to whether there is a requirement to accommodate equipment which is only capable of operating on specific channels.

M/A-COM supports the Department’s policy of preferring and encouraging marketplace (“commercial”) solutions to interference in the 4.9 GHz band: for example; solutions such as “frequency hopping/spread spectrum” and dynamic frequency selection may be able to avoid interference in the band. In addition, there may be a value to some customers to have a frequency planned network as a means to maximize use of the spectrum and to architect local networks that can avoid interference. If the Department follows the licensing strategies discussed below, there is no need to make a special provision for equipment which is only capable of operating on a single channel. Moreover, marketplace solutions will allow deployment of technologies used in adjacent bands which will provide for reduced costs and improved efficiencies (e.g., from economies of scale).

3. Channeling Plan

The Department seeks comment on the proposal to adopt this RF channeling plan. Is there a requirement for separate channels for fixed and mobile applications, etc? Provide rationale if an alternative plan is preferred.

M/A-COM supports the channeling plans proposed by the Department which mirror the channeling plans proposed by the FCC in the United States for the same band. Adopting the same plan will support public safety goals in Canada because:

- major suppliers (such as M/A-COM) have already begun product development activity on the basis of the FCC's channeling plan;
- cross-border interoperability would be enhanced between the United States and Canada; and
- as the Department rightly notes "[i]t is expected that this will provide users with maximum flexibility to employ existing technologies, to facilitate economies of scale, and allow for the implementation of future broadband technologies".

In addition, because 4.9 GHz broadband networks provide for a combination of fixed and mobile services (as discussed in Section 1), M/A-COM believes that there is no need to provide separate channels for fixed and mobile use. In fact, the applicability of the band will be severely limited by providing separate channels for fixed/mobile applications. If channels are "reserved" for solely fixed or mobile use, hybrid networks in which a single channel provides a combination of fixed/mobile services (as per Figure 1) will not be possible.

4. Licensing

The Department is of the view that the issuance of spectrum licenses as described above will best accommodate these uses. Comments are invited on the proposal. If comments support the accommodation of permanent fixed point-to-point operations, please indicate whether there should be a requirement for licensing on a site-by-site basis. The Department invites alternative proposals for licensing of the services. Provide details as to which specific aspects of the alternative proposal you consider to be favorable.

M/A-COM supports the Department's view that the most appropriate radio authorization in the band 4.9GHz is a non-exclusive spectrum license to eligible entities. M/A-COM also agrees that individual site licenses should not be required.

Moreover, as per M/A-COM's comments in Section (1) above, fixed point-to-point and point-to-multi-point operations are an integral element to the broadband architectures envisioned for public safety deployment in the 4.9 GHz band. These types of fixed operations are already being deployed in the 5 GHz band, and given smart technologies, similar power and propagation profiles of fixed and mobile elements of these converged networks, it is imperative that the fixed elements of the network be accorded the same regulatory treatment as the mobile elements of the network.

With respect to the Department's review of the "US Approach", M/A-COM wishes to inform the Department that the FCC has been asked to clarify the FCC rules for 4.9 GHz so as to ensure that fixed links within hybrid public safety networks (such as those outlined in Figure 1) have co-primary status with mobile links. The published rules are currently inconsistent with the underlying public record. Recently, the Private Radio Section of the Telecommunications Industry Association informed the FCC that the members of TIA strongly supported the need for the FCC to issue a clarification that mobile elements of a 4.9 GHz broadband network are co-primary with fixed

elements.² In light of the fact that the TIA letter reflects broad industry support for the needed clarification, M/A-COM believes the FCC will react favorably to the petition for clarification.

5. Technical Standards for the Mobile Service

The Department seeks comments on whether there is a requirement for interoperable communications in the band 4 940-4 990 MHz and if so, whether there is a requirement for a dedicated channel for interoperability purposes. In addition, the Department seeks comments on whether it should recommend a common/open standard (e.g. the Media Access Control and physical layers) for equipment used by public safety agencies in the band 4 940-4 990 MHz. If yes, what should it be? Provide technical rationale for the proposed common/open standard.

M/A-COM believes there will be operational requirements for interoperable communications in the 4.9 GHz band. The issue is how interoperability is defined.

As a general matter, M/A-COM, like many other industry members, believes data interoperability should be viewed at the network level and not the air-interface or unit-to-unit level. Network-based interoperability enables communications among radios over multiple frequency bands regardless of whether the radios operate in similar networks or not.

Moreover, as opposed to voice applications where voice applications have been standardized, there is very little operational utility for designated interoperability channels in the wideband and/or broadband spectrum areas in order to achieve unit-to-unit over-the-air data interoperability. Furthermore, to date, no standardized or mandated data applications have been introduced for the public safety bands. Without such applications, effective data interoperability will be unlikely even where units (i.e., radios) employ the same over-the-air protocol.

In the United States, public safety users have been unable to identify any operational need necessitating the use of designated wideband interoperability channels for over-the-air, unit-to-unit data. The only operational interoperability requirement identified by the public safety community has been short text messaging. However, short text messaging does not require the use of dedicated wideband or broadband channels. All that is required are dedicated narrowband interoperability channels.

In light of the foregoing, M/A-COM believes that, in the very near future, the public safety community in the United States will propose that the FCC restructure the wideband 700 MHz spectrum, so as to re-designate the existing dedicated wideband interoperability channels as additional general use wideband spectrum.

In sum, M/A-COM believes that market-based technology and network level solutions will best address the data interoperability issues in the 4.9 GHz band. M/A-COM submits that the data interoperability successes already achieved in the WiLAN, WiFi and cordless phone markets provide ample support in this regard.

With the technical rules that the US has established for the 4.9GHz band, there are multiple open standard technologies which can be used for broadband data services, such as 802.11 and 802.16 and their progeny. If the Department follows a similar set of technical rules, there will be multiple open standard technology options that can be deployed in this band.

² See letter of the Telecommunications Industry Association to Michael J. Wilhelm, Esq., Chief of the Public Safety and Critical Infrastructure Division of the Wireless Telecommunications Bureau dated September 16, 2005 and filed in Docket WT 00-32 on September 16, 2006.
http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518158667

Accordingly, M/A-COM believes that Industry Canada should adopt the FCC's approach of not mandating broadband equipment standards and interoperability channels for the reasons mentioned above as well as for the reasons set forth in the Department's *Notice*.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis Martinez", written in a cursive style.

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M/A-COM, INC.