

April 29, 2022

Ms. Josette Gallant  
Senior Director, Terrestrial Engineering and Standards  
Engineering, Planning and Standards Branch  
Innovation, Science and Economic Development Canada  
235 Queen Street, 6<sup>th</sup> Floor  
Ottawa, ON, K1A 0H5  
(Submitted by email - spectrumengineering-genieduspectre@ised-isde.gc.ca)

**Re: Canada Gazette Notice No. SMSE-004-22 – Consultation on the Technical and Policy Framework for Radio Local Area Network Devices in the 5850-5895 MHz Frequency Band and for Intelligent Transportation Systems in the 5895-5925 MHz Frequency Band**

Dear Ms. Gallant,

### **Introduction**

The Radio Advisory Board of Canada (RABC) is pleased to provide the following response to the questions raised in the above noted consultation. The response was developed by members of the Board's Fixed Wireless Communications Committee. Responses to the questions identified in the consultation are provided below.

### **Question 1**

*ISED is seeking comments on the proposal to allow the use of licence-exempt RLAN devices in the 5850-5895 MHz band on a no-protection, no-interference basis.*

RABC supports allowing RLAN in the 5850-5895 MHz band on licence-exempt, no-protection, no-interference basis. However, RABC does have two concerns:

- The proposal to allow outdoor use of RLANs (see response to question 4); and
- Coexistence with ITS in 5895-5925 MHz (see response to question 8).

The concern is with regard to the potential harmful interference<sup>1</sup> to ITS safety related services from RLANS.

## **Question 2**

*ISED is seeking comments on the proposal to rescind the ITS designation in the 5850-5895 MHz band while maintaining the ITS designation in the 5895-5925 MHz band.*

RABC is aware of an ongoing appeal in the U.S. related to a FCC decision to rescind the ITS designation in 5850-5895 MHz band. RABC encourages ISED to continue monitoring developments in the US. In the event that FCC decision is overturned, it may not be appropriate to rescind the designation in Canada if the designation is reinstated in the US.

It is also noted that the reduction in bandwidth allocated to ITS has the potential to limit deployment of future services including but not limited to: cooperative platooning (convoy driving), cooperative-adaptive cruise control, vehicle sensor sharing, object recognition, merge support, vehicle-to-pedestrian communication, red light warning, and emergency vehicle warning.

## **Question 3**

*ISED is seeking comments on the proposed footnote Cxx and the changes to the CTFA as shown in table 3.*

Consistent with our answer to Question 2, RABC has no objection on adding the proposed footnote to the CTFA, assuming the FCC decision to rescind the ITS designation is maintained and upon confirmation from technical interference analysis that licence-exempt RLAN devices does not adversely impact ITS operations as per response to question 4 below.

## **Question 4**

*ISED is seeking comments on its proposal that all indoor and outdoor licence-exempt RLAN devices could have immediate access to the range 5850-5895 MHz once appropriate technical standards are in place.*

RABC notes that the FCC has adopted rules to allow for immediate access to unlicensed indoor operations across the 5850 – 5895 MHz band, and the FCC will consider outdoor use at a later time. Given that ISED has proposed to give immediate access to both indoor and outdoor license-exempt RLAN devices in the same frequency range as FCC, the RABC recommends that the Department carry out technical interference analysis before allowing outdoor use in Canada to ensure ITS operations in the adjacent frequency range of 5895-5925 MHz are not adversely

---

<sup>1</sup> <https://laws-lois.justice.gc.ca/eng/acts/R-2/page-1.html>

impacted by RLAN operations (especially with respect to the use of in-car Wi-Fi devices). Please also refer to our response to Question 8.

In addition, before outdoor use is allowed, RABC recommends that the Department consider appropriate measures to protect the co-frequency Fixed Satellite Service (FSS) uplinks in the 5850-5895 MHz band, such as the vertical elevation mask adopted for standard power licence-exempt devices in the 5925-6425 MHz band.<sup>2</sup> In the interests of harmonization, the Department should note that the FCC is proposing such a mask for outdoor unlicensed operations in the 5850-5925 MHz band.<sup>3</sup> While no FSS earth station is presently licensed in this uplink band, a number of FSS space stations have been approved to provide service in Canada in this band.<sup>4</sup>

### Question 5

*ISED is seeking comments on its proposal to not impose a transition plan to displace existing ITS deployments out of the 5850-5895 MHz band.*

RABC agrees with ISED's proposal considering the Board's understanding that there are a limited number of commercially available certified devices and only one type of device was installed in one model of vehicle for vehicle-to-vehicle communication.

### Question 6

*ISED is seeking comments on the proposal that existing ITS deployments in the 5850-5895 MHz band may continue to operate under a no-protection, no-interference basis. ISED also seeks comments on no longer allowing the certification of new ITS OBU devices in the 5850-5895 MHz range.*

RABC agrees with both ISED proposals. The Board is of the view that the band 5895-5925 MHz may not be sufficient to support all ITS related applications, therefore allowing existing ITS deployments in the 5850-5895 MHz band to continue to operate under a no-protection, no-interference basis may provide additional bandwidth for non-safety related ITS applications to the extent DSRC technology continues to be utilized for ITS.

---

<sup>2</sup> SMSE 06-21, *Decision on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band* (May 2021), paragraphs 63.

<sup>3</sup> FCC, *In the Matter of Use of the 5.850-5.925 GHz Band*, FCC 20-164, First Report and Order, Further Notice of Proposed Rulemaking, And Order of Proposed Modification, at ¶ 184.

<sup>4</sup> See, e.g., List of foreign satellites approved to provide fixed-satellite services (FSS) in Canada, <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf02104.html>.

## Question 7

*ISED is seeking comments on whether it should mandate the use of a specific technology in the 5895-5925 MHz band for ITS services. If so, should the mandated technology be harmonized with the US and therefore, be based on C-V2X?*

RABC believes it is important to harmonize as much as possible on a particular technology to help developing the ecosystem for ITS services, with special consideration of the trends in the US, Europe and China.

Currently, Europe is technology neutral in terms of ITS<sup>5</sup>. There are extensive DSRC deployments. At least one European automobile manufacturer continues to support the use of DSRC, while also considering harmonizing with C-V2X.

In North America, there is a split in support amongst automobile manufacturers for Wi-Fi (DSRC) and C-V2X protocols. The Board understands that the FCC is considering mandating the use of 3GPP-based C-V2X technology for ITS related applications. However, there is also a legal challenge in the US regarding the availability of the C-V2X standard to all manufacturers. Therefore, several automotive Original Equipment Manufacturers (OEMs) are waiting on the sidelines until the appeals of the US FCC final rule run their course. The outcome in the US will likely define the technology path of OEMs in Canada, presuming the standards and spectrum protections are in place, in order to provide ITS safety services.

Based on the above, one RABC Sponsor Member expressed the view it may be premature at this point to mandate a technology for ITS services in Canada, until there is more worldwide certainty regarding which technology is being adopted (with particular consideration to the direction in the US).

The RABC provides the following high-level description of 3GPP-based C-V2X technology for information.

The first cellular standards to incorporate C-V2X features were based on 4G LTE, i.e., 3GPP Releases 14 and 15, and include support of C-V2X-enabled basic safety messages at 5905-5925 MHz. Since C-V2X is designed to be functionally-backwards compatible with earlier versions, new vehicles can communicate with earlier versions of C-V2X-enabled vehicles and infrastructure. In that regards, the basic safety messages will continue to be carried over 4G LTE in a 20 MHz channel. New vehicles supporting 5G-based advanced C-V2X will use a separate wider channel for advanced applications.

---

<sup>5</sup> <https://5gaa.org/news/deployment-band-configuration-for-c-v2x-at-5-9-ghz-in-europe/>

As it is shown in Fig. 1, compared to DSRC (IEEE 802.11p), C-V2X will support wider range of new applications including autonomous driving use cases in Rel-16 and Rel-17, while maintaining the backward capabilities.

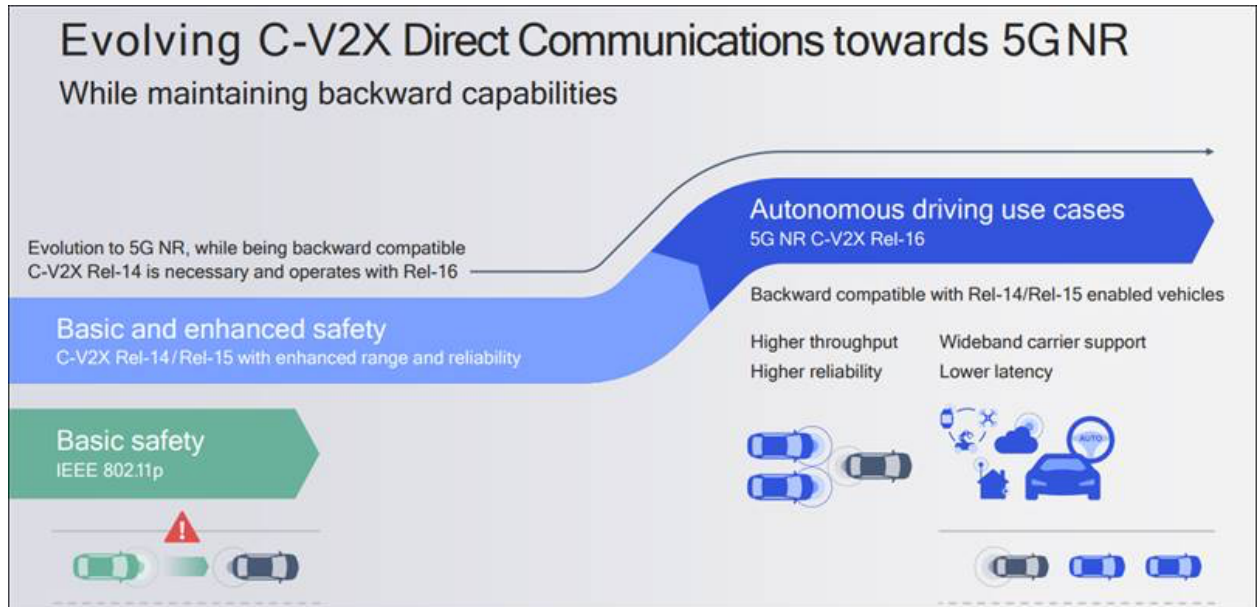


Fig. 1: C-V2X vs. IEEE 802.11p-based technologies evolution (source: Qualcomm<sup>6</sup>)

The major difference that sets C-V2X apart from DSRC (which focuses on safety messages) is that C-V2X is comprised of two complementary vehicular communications modes:

- **Direct mode** (“C-V2X-Direct”), referred to as PC5 in 3GPP operating in ITS bands (e.g., 5.9 GHz)
  - enables cellular communications directly, without connecting to any cellular network and without requiring any network service subscription
  - C-V2X-Direct communications include:
    - (1) vehicle-to-vehicle (“V2V”) communications of safety information among nearby vehicles, to ensure smooth travel and prevent collisions.
    - (2) vehicle-to-roadside infrastructure (“V2I”) communications, including communications between vehicles and traffic lights, message signs, road alerts, and other roadway information, to enable efficient travel and
    - (3) vehicle-to-person (“V2P”) communications to communicate safety information between vehicles and other road users (e.g., pedestrians, bicyclists, scooter riders, etc.)

<sup>6</sup> <https://www.qualcomm.com/media/documents/files/5g-nr-based-c-v2x-presentation.pdf>

- Indirect (Network) mode (“V2N”)**, referred to as the Uu interface (Operating in operator’s licensed bands e.g., n71, n78)
  - the cellular network can collect data from many cars, and thus can be more effective at managing traffic on a larger scale. Originally designed in Release 14 to use the LTE standard, 3GPP later added compatibility for 5G and 5G NR in Releases 15 and 16.

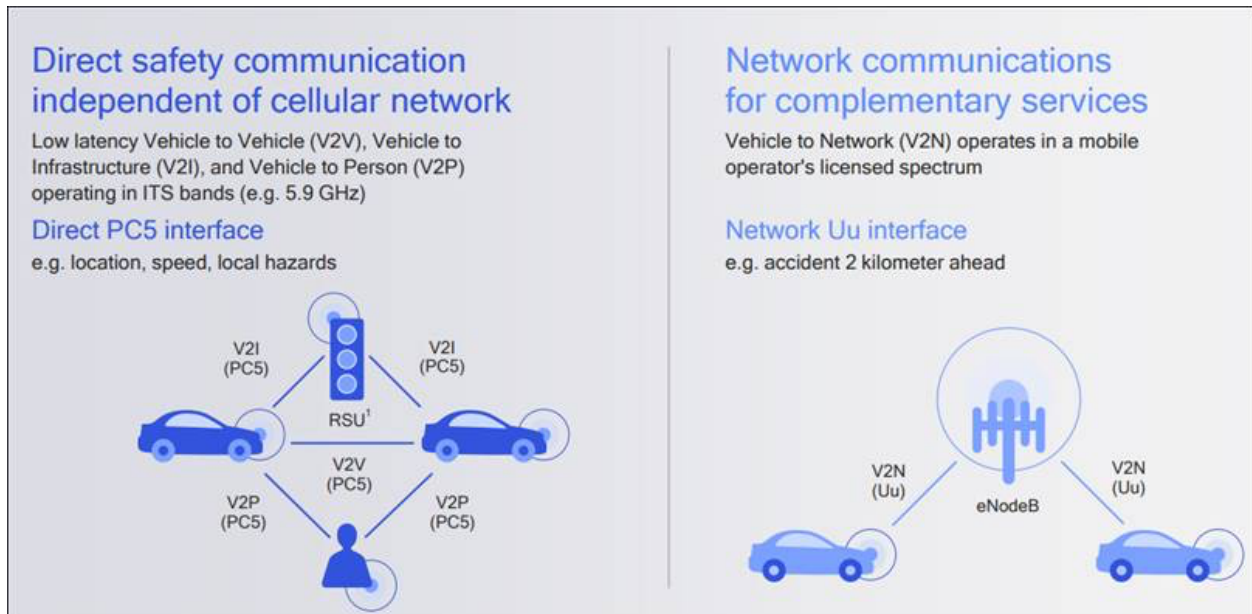


Fig. 2: C-V2X includes support of both direct communication and traditional cellular-network based communication (source: Qualcomm<sup>2</sup>)

RABC agrees with ISED that C-V2X and DSRC are not compatible<sup>7</sup>.

### Question 8

*ISED is seeking comments on the proposal to continue to allow ITS on-board units (OBUs) to operate on a licence-exempt, no-protection, no-interference basis.*

RABC agrees with ISED’s proposal that, moving forward, OBU continues operating on licence-exempt basis. That being said, as stated in response to question 4 above, any RLAN device operating in 5850-5895 MHz band should be not cause harmful interference to ITS OBU devices in 5895-5925 MHz. Similarly, it would be important that RLAN devices operating above 5925 MHz do not cause harmful interference to ITS OBU. It is less likely that ITS safety services (such

<sup>7</sup> SMSE-004-22 “Consultation on the Technical and Policy Framework for Radio Local Area Network Devices in the 5850-5895 MHz Frequency Band and for Intelligent Transportation Systems in the 5895-5925 MHz Frequency Band”, paragraph 52

as critical messaging to prevent crashes) would be deployed in Canada, if operated under a no-protection rule from RLANs.

RABC also notes that 5G Automotive Association highlighted recently to ISED potential interference to C-V2X in 5850-5925 MHz from RLAN operation above 5925 MHz, especially with use of in-car Wi-Fi<sup>8</sup>. Based on this, RABC is of the view that new unlicensed operations in the proposed 5850-5895 MHz, if allowed outdoor, presents similar risk of interference to C-V2X in the upper 30 MHz portion of the 5.9 GHz band because such operations would be directly adjacent to the remaining C-V2X operations. Specifically, degradation of the effectiveness of C-V2X direct safety services is primarily caused by two factors: (1) insufficient isolation between the C-V2X receiver and in-vehicle licence-exempt device transmissions and (2) the fact that the interferer travels with the vehicle—in continuous close range of the C-V2X receiver—causing sustained interference.

Therefore, the likelihood of C-V2X users being susceptible to interference from in-car Wi-Fi devices operating in adjacent bands (5850-5895 MHz and 5925-7125 MHz) needs to be fully studied. If the Department reallocates the lower 45 MHz of the 5.9 GHz band (5850-5895 MHz) to unlicensed use allowing outdoor use, it must ensure no interference to C-V2X operations in the upper 30 MHz portion of the band. To ensure that the upper 30 MHz portion of the 5.9 GHz band can support C-V2X roadway safety applications, the department should adopt technical proposals governing the proposed unlicensed operations. The importance of such protection measure cannot be overstated and are fully in line with the department's expressed commitment to enable reliable and robust ITS operations in the 5.9 GHz band.

It should also be noted that the above concern equally applies to DSRC technology.

### Question 9

*ISED is seeking comments on the options for a licensing regime for ITS RSUs, specifically:*

- *Option 1 a licence-exempt approach or*
- *Option 2 a spectrum licence approach*

*Provide an explanation as to why ISED should proceed under either option, including how the choice of licensing method will support ISED's policy objectives, and how it will support the envisioned ITS environment and services that will be offered to customers.*

Interoperability of OBUs with RSUs nationwide is likely required for successful deployment of ITS and to realize the safety objective of reducing, and eventually eliminating, preventable

---

<sup>8</sup> [https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SMSE-014-20-5GAA-replycomments.pdf/\\$file/SMSE-014-20-5GAA-replycomments.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SMSE-014-20-5GAA-replycomments.pdf/$file/SMSE-014-20-5GAA-replycomments.pdf)

crashes. Accordingly, RABC supports option 2 (spectrum licence approach) for RSU licensing for two reasons:

- Protecting RSU from interference, considering the safety critical nature of ITS applications; and
- Deterring deployment of RSUs that do not have a legitimate ITS role, thereby reducing the potential for congestion.

This would be consistent with the FCC which is implementing a non-exclusive geographic areas licensing regime for the RSU in the US.

### **Question 10**

*If a spectrum licensing approach is preferable, ISED is seeking comments on:*

- a. whether the licensing should be on a first-come, first served or shared use basis*
- b. the most efficient way for ISED to assign the spectrum and*
- c. any conditions of licence that should be considered in order to effectively manage interference and to provide information to assist in coordination between stations and managing interference*

RABC has no response for either Question 10 a, or 10 b.

Regarding Question 10 c, RABC notes there are ongoing R&D activities related to practical implementation of software-only modifications to ITS technology that will provide the capability to detect and report short-range interference in this band.

### **Conclusion**

This response was sent to RABC Sponsor Members for ballot. Of the Board's 21 Sponsor Members, 12 voted to approve (Bell Canada, Canadian Association of Chiefs of Police, Canadian Electronics and Communications Association, Canadian Satellite and Space Industry Forum, CanWISP, CBC/Radio Canada, Department of National Defence, Global Automakers of Canada, Radio Amateurs of Canada, Railway Association of Canada, Rogers Communications and TELUS); and 2 abstained (Canadian Association of Broadcasters and NAV CANADA).

The Board appreciates the opportunity to respond to this important consultation.

Sincerely,



J. David Farnes  
General Manager