IEEE 802.18

Radio Regulatory Technical Advisory Group

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| Reply Comments on FCC19-138 NPRM Revisiting Use of the 5.850-5.925 GHz Band |
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Abstract

r03:

r02:

r01: 17mar, .18 ad hoc – many different sections are areas of edits and updates.

r00: 16mar, .18 ad hoc - initial draft to get started

**Before the**

**Federal Communications Commission**

**Washington, D.C. 20554**

In the Matter of )

)

Use of the 5.850-5.925 GHz Band ) ET Docket No. 19-138

 )

**Reply Comments of IEEE 802**

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# Introduction

IEEE 802 LAN/MAN Standards Committee (LMSC) is pleased to provide reply comments on the above-captioned proceeding to the NPRM on the use of the 5850-5925 MHz Band dated 06 February 202 in the United States Federal Register.

IEEE 802 LMSC is a leading- consensus-based industry standards body, producing standards for wireless networking devices, including wireless local area networks (“WLANs”), wireless specialty networks (“WSNs”), wireless metropolitan area networks (“Wireless MANs”), and wireless regional area networks (“WRANs”). We appreciate the opportunity to provide these comments to the Commission.

IEEE 802 is a committee of the IEEE Standards Association and Technical Activities, two of the Major Organizational Units of the Institute of Electrical and Electronics Engineers (IEEE). IEEE has about 420,000 members in about 190 countries and supports the needs and interests of engineers and scientists broadly. In submitting this document, IEEE 802 acknowledges and respects that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802. Therefore, this submission should not be construed as representing the views of IEEE as a whole.[[1]](#footnote-1)

With the release of FCC NPRM 19-129 (E.T. Docket 19-138), the United States Federal Communications Commission has requested comments and reply comments regarding assessing the 5.9 GHz band rules and proposing appropriate changes to ensure the spectrum supports its highest and best use. In this NPRM it is proposed to: “… continue to dedicate spectrum—the upper 30 megahertz portion of the band—for transportation and vehicle safety purposes, while repurposing the remaining lower 45 megahertz part of the band for unlicensed operations to support high-throughput broadband applications.”

The IEEE Std 802.11p-2010 amendment, now incorporated into IEEE Std 802.11-2016, provides core technology for Dedicated Short-Range Communication (DSRC). The term "OCB" (outside the context of a BSS (Basic Service Set)) was introduced in IEEE 802.11p, which specified "Wireless Access in Vehicular Environments". The OCB specifications within IEEE Std 802.11 continue to support DSRC-compatible operation.

The IEEE 802.11 Working Group (WG) is now specifying an IEEE Next Generation V2X (Vehicle-to-everything) amendment with the IEEE P802.11bd project. The IEEE P802.11bd amendment is intended to provide a seamless evolution path from DSRC in the 5.9 GHz DSRC band. Any consideration of the rules governing use of the 5.9 GHz band must recognize the societal value of allowing DSRC and IEEE P802.11bd to operate together in the ITS band. It should be noted that one of the advanced features being specified for the IEEE P802.11bd project is 20 MHz bandwidth operation that co-exists with 10 MHz IEEE Std 802.11p and IEEE P802.11bd.

}}16mar: one suggestion is these 3 paragraphs are not needed. at least not spend time on them, spend time below. other input could leave them in, with updated**. a member is working on some quick edits. done.**

# Reply comments on DSRC and C-V2X

A number of commenters [\_x\_] have claimed that DSRC is “outdated” and as a consequence has not been deployed which is simply not the case. First, DSRC is based on the IEEE Std 802.11-2016 OCB operation, and therefore is built using up to date WLAN modules that are in all phones and laptops today. Secondly, the U.S. Department of Transportation (DOT) in their comments of March 9, 2020 [y] state that “Currently, over 123 sites across the Nation are putting the 5.9 GHz band into use. This number grew from 87 sites in June 2019.” including the large number of ITS safety and ITS efficiency services deployed today in the Connected Vehicle Pilot programs in New York City, Tampa, FL, Wyoming, and Columbus, Ohio [2]. Thus, not only is DSRC a state-of-the-art technology, it has been and continues to be deployed for ITS safety and ITS efficiency services around the world. Furthermore, DSRC is being enhanced by the IEEE P802.11bd project.

[\_x\_] **member will find a reference(s)**

[y] Comments of the NTIA and DOT; [https://ecfsapi.fcc.gov/file/10313251510165/5.850-5.925 GHz Band C ET Dkt No. 19-138.pdf](https://ecfsapi.fcc.gov/file/10313251510165/5.850-5.925%20GHz%20Band%20C%20ET%20Dkt%20No.%2019-138.pdf)

[2] CV Pilot Deployments:

<https://www.its.dot.gov/pilots/index.htm>

[https://www.tampacvpilot.com/learn/resources/](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.tampacvpilot.com_learn_resources_&d=DwQFAg&c=pqcuzKEN_84c78MOSc5_fw&r=z8R-nWJ8GIxwjOjNKhEFByb-tZ6XE3GZXWSggNdVo-w&m=98HemWglgu3Uas86g8E5dyN3PQxE1UeB-BayaARBcOo&s=n8CT9zigLtDJlf2ls0Tiz4dnNGZD-O221EJJtQ_0-Bo&e=)

[https://www.its.dot.gov/pilots/pilots\_nycdot.htm](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.its.dot.gov_pilots_pilots-5Fnycdot.htm&d=DwQFAg&c=pqcuzKEN_84c78MOSc5_fw&r=z8R-nWJ8GIxwjOjNKhEFByb-tZ6XE3GZXWSggNdVo-w&m=98HemWglgu3Uas86g8E5dyN3PQxE1UeB-BayaARBcOo&s=q0LvkLl1saFkJVjWwtjwdALDPf1t-UkNZoL40-Sz1c4&e=)

[https://wydotcvp.wyoroad.info/](https://urldefense.proofpoint.com/v2/url?u=https-3A__wydotcvp.wyoroad.info_&d=DwQFAg&c=pqcuzKEN_84c78MOSc5_fw&r=z8R-nWJ8GIxwjOjNKhEFByb-tZ6XE3GZXWSggNdVo-w&m=98HemWglgu3Uas86g8E5dyN3PQxE1UeB-BayaARBcOo&s=CQBVC9OH6N-KYSpnSX9Wun_rjvkyGJrGeqsUYPzac5k&e=)

<https://smart.columbus.gov/uploadedFiles/Projects/Smart%20Columbus%20Concept%20of%20Operations-%20Connected%20Vehicle%20Environment.pdf>

}} general comments seen – DSRC is not outdated -- however IEEE 802 has an amendment to DSRC going to update to meet latest needs, which is a normal IEEE 802 process to constantly update standards. 11bd is fully backward compatible. could we reiterate our original comments?

}} **16mar:** look at our evaluation path the IEEE has and LTE C-V2X. **member will look at some text. text is coming. need to ID which comments we are replying again, maybe the DoT is comments. LTE is not new either.**

~~To facilitate this discussion, we offer specific definitions of key terms. These definitions describe various relationships between IEEE Std 802.11-2016 OCB (802.11p) devices and IEEE P802.11bd devices (also known as DSRC and IEEE NGV devices, respectively). While these definitions are for devices implementing the DSRC and IEEE NGV technologies, they may also be applied more generally to analyze the relationship between other V2X technologies. These definitions are agreed [15]~~~~within IEEE P802.11 TGbd (the task group developing the IEEE P802.11bd amendment):~~

~~•~~ **~~Interoperability –~~** ~~IEEE 802.11p devices to be able to decode at least one mode of transmission of IEEE 802.11bd devices, and IEEE 802.11bd devices to be able to decode IEEE 802.11p transmissions~~

~~•~~ **~~Co-existence~~** ~~– IEEE 802.11p devices to be able to detect IEEE 802.11bd transmissions (and hence defer from transmissions during IEEE 802.11bd transmissions causing collisions) and vice versa~~

~~•~~ **~~Backward compatibility~~** ~~– Ability of IEEE 802.11bd devices to operate in a mode in which they can interoperate with IEEE 802.11p devices~~

~~•~~ **~~Fairness~~** ~~– Ability of IEEE 802.11p devices to have the same opportunities as IEEE 802.11bd devices to access the channel~~

~~}} many comments had C-V2X and DSRC are not compatible, can we find a few to note? -- we can agree as we stated in our comments and support this is a detriment to the use of C-V2X and a significant advantage to stay with DSRC considering the many deployments and state DOTs investments to date.~~ **~~who can contribute text?~~**

~~}} need to reiterate why it took so long to get going. can we find comments that help defend why it took time for DSRC to be implemented?~~ **~~16mar: move to low priority, may not get to.~~**

~~}} can we find some comments that had that DSRC is gaining and it was significant in 2019?~~ **~~16mar: move to low priority, may not get to.~~**

~~}} what about finding commenters talking to C-V2X NR and is not compatible with C-V2X LTE? we said that, so agree with those commenters.~~ **~~who can contribute text?~~**

**~~}} 16mar: could point back to our comments, points below touch on this.~~**

}} 5GAA early on wanted/needed more than 20 out of the 75MHz, now they are saying they can use 20 out of 30 MHz. what is this evolution path for 4G with the 20MHz (or 30 MHz) slice? who can contribute text?

}} do they talk to 30MHz is okay, then opens the door to this discussion? who can find this?

[5GAA Comments (3-9-2020).pdf](https://ecfsapi.fcc.gov/file/10309096401111/5GAA%20Comments%20%283-9-2020%29.pdf)

}} #2 point on 5GAA – they want rules focused on 3GPP only protocol, if v14 & v16 are not compatible, then DSRC should be allowed also. a member is working on text.

While a majority of commenters wrote in favor of retaining the 75 MHz for ITS safety and efficiency services, there were several commenters that spoke in favor of the proposed reallocation. Of those that spoke in favor of retaining 75 MHz for ITS, some indicated a tolerance for C-V2X in a 20 MHz portion of that 75 MHz band. First, IEEE 802 cautions that such comments should not infer a support for C-V2X in a reduced bandwidth ITS band. Second, from a technical perspective, the considerations of which V2X technologies should be permitted in the ITS band are different for a 75 MHz ITS band than for a reduced bandwidth ITS band (e.g. for 30 MHz as the NPRM proposes). In a 75 MHz ITS band, concerns about same-channel evolution and spectral efficiency are reduced. In a 30 MHz ITS band, same-channel evolution and spectral efficiency of the entire 30 MHz band become imperative. IEEE 802 cautions not to infer from such comments a support for C-V2X in a reduced bandwidth ITS band. IEEE 802 stresses that DSRC has advantages over LTE V2X with respect to both same-channel evolution and spectral efficiency.

The next generation IEEE Std 802.11 technology being developed in the IEEE P802.11bd amendment is intended to provide a seamless evolution path from DSRC in the 5.9 GHz ITS band. Any consideration of the rules governing use of the 5.9 GHz band must recognize the value that DSRC and IEEE P802.11bd can operate together in the same ITS channels and can coexist, share resources and do not interfere with each other. This coexistence and ability to share resources even extend to the introduction of advanced features such as 20 MHz bandwidth operation, which is currently being developed in the IEEE 802.11bd project.

~~[x] Comments of IEEE 802, FCC ET Docket 19-138, March 5, 2020, p. \_\_\_\_\_\_\_\_\_~~

}} 17mar: is “ITS band” well understood what that mean? the NPRM has references to this.

}} 5G Americas - cellular technologies to support a wider, richer range of services than is possible using DSRC and Release 15(?) - **who can contribute text pointing back to our comments against these specific points?**

IEEE 802 disagrees with 5G Americas’s[[2]](#footnote-2) assertion that 3GPP Release 14 LTE V2X supports a “richer range of services than is possible using DSRC”. DSRC supports every ITS service supported by Release 14 C-V2X sidelink. Moreover, DSRC supports a wide range of “advanced V2X”[[3]](#footnote-3) services that 3GPP concedes Release 14 LTE V2X was never intended to support such as vehicle platooning and sensor data sharing. Furthermore, since Release 14 LTE V2X only uses broadcast, and does not possess a native unicast capability, there are a set of basic ITS services supported by DSRC that Release 14 LTE V2X cannot directly support. These include important services related to Infrastructure-to-vehicle warnings (e.g. Wrong-Way Driving Alert[[4]](#footnote-4)), communication to a V2X security credential management system (SCMS), and collection of probe vehicle data.

Several commenters [add refs here] claim that by allocating ITS spectrum specifically to Release 14 LTE V2X, many of the benefits that can be derived from using (5G) cellular connectivity to vehicles accrue. This is not true. Any Release 14 LTE 2X module used for ITS safety and efficiency services in ITS spectrum must be available 100% of the time for ITS services and would not be available to provide cellular connectivity. Cellular connectivity will require separate communication resources to provide such connectivity. Hence, the advantages of cellular connectivity are orthogonal to C-V2X. The fact that C-V2X is also specified by 3GPP does not mean they are an integrated V2X solution. Cellular connectivity is just as easily coupled with a DSRC ITS safety and efficiency communication module. In fact, all OBUs deployed today have cellular interfaces in addition to DSRC ITS communication modules operating in ITS spectrum and as such, are already utilizing the benefits of cellular connectivity when and where appropriate.

}} 17mar: **member will look for a reference for the 3GPP moreover…… .**

}} 16mar: DSRC does all what C-V2X and more, for example \_\_\_\_\_…., **a member will adjust 2nd sentence**.

}} 16mar: they claim adding Cellular to C-V2X, from the 5GAA web site. V2N and 5.9 direct need to address-both, **Member will add a sentence.**

}} 16mar: **a member will look for a list,** if found will review, if not will pass.

}} 5G Americas, page 11:

Support of TDM-based and FDM-based mechanisms for coexistence between LTE and NR sidelinks;

the bullet is actually a chip that has 2 radios in it, *above is to adjacent channel, not same channel co-existence*. this needs to be clarified. they are looking at TDMA. a member is working on text.

[5G Americas 5.9 GHz Comments 3.9.20 FINAL.pdf](https://ecfsapi.fcc.gov/file/1030957873656/5G%20Americas%205.9%20GHz%20Comments%203.9.20%20FINAL.pdf)

IEEE 802 finds a statement from 5G Americas misleading. 5G Americas notes that 3GPP Release 16 5G NR V2X has considered “support of … mechanisms for coexistence between LTE and NR.”[[5]](#footnote-5) It is important to understand that LTE V2X (Release 14) and 5G NR V2X (Release 16) will not coexist in the same channel. 3GPP’s consideration is only for coexistence in adjacent channels.

}} 16mar: a leading sentence is requested to set this up. **member will provide for review.**

the NPRM is pointing to rel 14 now and where we should focus, while some are focusing on rel 16, which is not in the NPRM.

}} 16mar: lack of backward compatibility is not mentioned. with LTE and NR needing additional resources, additional channels, etc. **A member will look at an additional statement on the backward compatibility.**

}} … and the Satellite Industry Association have stated that they developed a sharing protocol between DSRC and FSS operations. should not assume C-V2X will share the same sharing as DSRC, it should be specifically demonstrated. **a member will look up the study and what can we do with reply comments, pointing to these comments?**

}} 16mar: research did not point specific to DSRC. we don’t need to reply comment on this. yes, C-V2X will need to look at sharing.

~~}} \* need SES InteliSat comments, page 3 and we would support the points.~~ **~~a member is working on text.~~**[~~SES and Intelsat Comments on 5 GHz UNII NPRM 9 March 2020.pdf~~](https://ecfsapi.fcc.gov/file/103092408113954/SES%20and%20Intelsat%20Comments%20on%205%20GHz%20UNII%20NPRM%209%20March%202020.pdf)

~~}} need to look at the Ford filing more.~~ **~~all to look at this and what text can we use?~~**

~~Our testing shows that C-V2X provides enhanced performance and reliability.~~

 ~~specific points why this is not true.~~ [~~Ford Submission to FCC Mar 9 2020.pdf~~](https://ecfsapi.fcc.gov/file/10309029866264/Ford%20Submission%20to%20FCC%20Mar%209%202020.pdf)

# Reply comments on OOBE

}} if text is provided, we will review, otherwise this section will be not be done.

# Conclusion:

IEEE 802 continues to provide open standards for WLAN connectivity and ITS applications supporting various regulatory domains, worldwide.

IEEE 802 thanks the Commission for providing an opportunity to comment on the NPRM ET Docket 19-138 and respectfully requests these comments be considered by the Commission during the final rule making process.

Regards,

By: /ss/ .

Paul Nikolich

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**References:**

[1]

other points to add:

1) if 75 MHz is retained, what tech to use? push back on all C-V2X or mostly C-V2X.

a) C-V2X inferior b) not real. **member is going to come up with some text**

2) supporting DoT outlined what the process needs to be. safety based technology. single standard is what is needed for safety as DoT says. and needs to be the one that best satisfies this need.

**member is going to come up with some text**

1. This document solely represents the views of the IEEE 802 LAN/MAN Standards Committee and does not necessarily represent a position of either the IEEE, the IEEE Standards Association or IEEE Technical Activities. [↑](#footnote-ref-1)
2. Comments of 5G Americas, FCC ET Docket 19-138, March 9, 2020, p. 5 [↑](#footnote-ref-2)
3. Overall description of Radio Access Network (RAN) aspects for Vehicle-to-everything (V2X) based on LTE and NR (Release 16), 3GPP TR 37.985 v1.1.0, February 2020 [↑](#footnote-ref-3)
4. Dedicated Short Range Communication(DSRC) Systems Engineering Process Guidance for SAE J2945/X Documents and Common Design Concepts, SAE J2945\_201712, December 2017 [↑](#footnote-ref-4)
5. Comments of 5G Americas, FCC ET Docket 19-138, March 9, 2020, p. 11 [↑](#footnote-ref-5)