**Before the
Federal Communications Commission**

**Washington, D.C. 20554**

In the Matter of )

 )

Petition for Waiver to Allow Deployment of ) GN Docket 18-357

Intelligent Transportation System Cellular )

Vehicle to Everything (C-V2X) Technology )

**COMMENTS OF IEEE 802**

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[Month, Day, Year filed]

1. Introduction

IEEE 802 is pleased to provide comments in the above-captioned proceeding.

IEEE 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 component of the IEEE Standards Association, one 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 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)

1. Inconsistency of 5GAA waiver request and U-NII-4 sharing proposals under evaluation today by the FCC and USDOT

The U-NII-4 proceeding has been active since 2013[[2]](#footnote-2), and through that proceeding two sharing proposals were brought forward for comment and at this point testing is actively ongoing with the FCC and USDOT. Both sharing proposals depend explicitly on U-NII-4 devices detecting the presence of IEEE 802.11p (DSRC) activity in the band, per FCC rules[[3]](#footnote-3) from 2003 that an ITS device follows the DSRC protocol. As the U-NII-4 proceeding has progressed it is working toward formzlizing these two sharing proposals, with a multi-phase test plan, phase 1 of the testing that has just been completed and results are availble[[4]](#footnote-4), with phase 2 being planned.

If non-DSRC ITS protocols are allowed to use the 5.9 GHz band, they will not be detected by U-NII-4 devices as proposed under the two sharing approaches. Detection of non-DSRC devices would be at best more complex and how effective is unknown. Then, by allowing this waiver for a non-DSRC ITS protocol, it would open the door and set a precedence that would allow other non-DSRC protocols over time and it is not known how approved and installed U-NII-4 devices could detect them or how long it would take to develop robust detection schemes among these different protocols.

[ add something on issues with detect and vacate sharing proposal? ]

Regarding the Re-channelization sharing proposal, the 5GAA proposal has incompatible views about the use of the 5895-5925 MHz portion of the band (and possibly also the 5850-5925 MHz band). Rather than the 7 - 10 MHz channels, the DSRC community would use the upper 3 for critical/safety needs, the lower 40 MHz would be less critical needs. The waiver request would cover 2 of the 3 proposed most critical/safety defined channels. There fore the plan and with current rules, vehicle safety would be compromised.

* Along with this is a further waiver/rule request was mentioned to go up and ask for more spectrum above.

**just for reference for now:**

|  |  |  |  |
| --- | --- | --- | --- |
| 170 | 5850-5855 | 5 | reserve |
| 172 | 5855-5865 | 10 |  |
| 174 | 5865-5875 | 10 |  |
| 175 | 5865-5885 | 20/10 |  |
| 176 | 5875-5885 | 10 |  |
| 178 | 5885-5895 | 10 | control |
| 180 | **5895-5905** | 10 |  |
| 181 | **5895-5915** | 20/10 |  |
| 182 | **5905-5915** | 10 |  |
| 184 | **5915-5925** | 10 |  |

1. V2X evolution under waiver is contrary to the public good; IEEE 802.11 NGV offers a seamless evolution path

The 5GAA waiver cites evolution in V2X technology as a rationale for allowing the introduction of technologies that are incompatible with DSRC into the 5.9 GHz band. The concept of evolution to incompatible technologies stands in stark contrast to the vision being realized today in the IEEE 802.11 Next Generation V2X (NGV) amendment under development in the IEEE 802.11 Working Group.

As the waiver request makes clear, the only way to introduce incompatible technologies is by band fragmentation. 5GAA seeks an initial fragmentation in this waiver request, and indicates it will seek a further fragmentation for “much more spectrum in the 5.9 GHz band” in the near future via a rulemaking petition.

By contrast, the IEEE 802.11 NGV amendment (also referred to as IEEE 802.11bd) will be compatible with DSRC. The scope of the NGV amendment includes the following key requirements:

This amendment shall provide interoperability, coexistence, backward compatibility, and fairness with deployed OCB (Outside the Context of a BSS) devices.[[5]](#footnote-5)

NGV devices will be capable of communicating interoperably with DSRC devices. NGV devices will also be capable of fair coexistence with DSRC devices in the same channel, and therefore it can be introduced with no band fragmentation. The SAE DSRC Technical Committee recently liaised to the IEEE 802.11 NGV Task Group to say that the combination of a capability for interoperability and fair same-channel co-existence “form the basis for a seamless evolution strategy from IEEE 802.11p [DSRC] to IEEE 802.11NGV and beyond.”[[6]](#footnote-6)

The IEEE 802.11 NGV amendment scope also requires that it provide for both improved communication performance (rate, sensitivity), as promised by C-V2X, and for support of new use cases such as localization.

Technology evolution is a means to an end, for improved performance and new use cases, not an end in itself. Evolution in the ad hoc V2X domain is inherently more difficult than in traditional wireless domains like cellular, due to the unmanaged and direct communication between devices (no base station to mediate across generations) and to the relatively long life times of on-board and roadside units. If not implemented thoughtfully, evolution can increase costs (e.g. by requiring investment in multiple incompatible technologies), decrease benefits (e.g. by duplicating services in fragmented spectrum), and provide a disincentive to automakers and road authorities to deploy V2X. The concept of evolution promoted by the 5GAA waiver request suffers from these disadvantages. By contrast, we think that the approach to evolution underway in the IEEE 802.11 NGV amendment increases the incentive to deploy DSRC today and IEEE 802.11 NGV in the future: it protects the value of DSRC investments through interoperability and fair, same-channel coexistence, it does not require investment in multiple incompatible technologies, and it does not diminish the value of the spectrum by fragmentation for duplicated services.

The concept of evolution represented by the 5GAA waiver request is contrary to the public good, and is a further reason to reject the petition.

1. Is this a waiver or more a rule change request?

With the waiver request asking to have DSRC devices vacate the upper 20 MHz, seems this is more than a waiver, more a request for a rule change, considering the current FCC rules, since 2003, state ITS devices are to follow the DSRC protocol as referred earlier in these comments.

As stated on 24 October 2018, the National Highway Traffic Safety Administration statement on safety value on 5.9 GHz spectrum[[7]](#footnote-7), there are more than 70 deployments using all seven DSRC channels in thousands of vehicles on the road today, and many using channel 184, e.g. in California, designated for public safety applications involving safety of life and property[[8]](#footnote-8). To vacate these users now seems would be a vehicle safety concern. Even channel 182 which the waiver is asking is being used, e.g. in New York and Florida, and would affect those users if having to change their operations to vacate channel 182 for this waiver.

There is also the US DoT Connected Vehicle Pilot Deployment Program that is in process in Wyoming, New York and Florida[[9]](#footnote-9). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

It is not clear in 5GAA’s waiver request why an experimental license request could not be used, as opposed to asking users following the FCC rules to vacate 20 MHz of the band. Since what they are proposing looks to be further experimentation, an experimental licence could be a possibility. At the same time why do they want to use the top 20 MHz where there are identified channels for public safety that are being used, as opposed to experiment on other channels that are for less critical applications.

1. Conclusion

Considering the points mentioned above, we therefore ask the Commission to request 5GAA to re-evaluate their waiver request considering these points and the Commission not act until such adjustments to the waiver request is done and then re- published and opened for further comments by interested parties such as IEEE 802.

Regards,

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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 or the IEEE Standards Association. [↑](#footnote-ref-1)
2. The “Unlicensed National Information Infrastructure (U-NII) Devices in The 5 GHz Band” Proceeding, ET Docket No. 13-49, <https://www.fcc.gov/ecfs/search/filings?proceedings_name=13-49&sort=date_disseminated,DESC> [↑](#footnote-ref-2)
3. See FCC Part 90 , Subpart M and Part 95, Subpart L [↑](#footnote-ref-3)
4. Results can be found at: <https://www.fcc.gov/document/fcc-requests-comment-59-ghz-phase-i-testing-data/attachment-a> [↑](#footnote-ref-4)
5. “802.11 NGV Proposed PAR”, IEEE 802.11 document 11-18-0861/r9, November 13, 2018 [↑](#footnote-ref-5)
6. SAE DSRC Technical Committee, “Response to IEEE 802.11 Next Generation V2X Study Group (NGV SG) Liaison Request”, November 28, 2018; IEEE 802.11 document 11-18-2097/r0 [↑](#footnote-ref-6)
7. U.S. Department of Transportation’s National Highway Traffic Safety Administration issues statement on safety value of 5.9 GHz spectrum, <https://www.nhtsa.gov/press-releases/us-department-transportations-national-highway-traffic-safety-administration-issues> [↑](#footnote-ref-7)
8. FCC Part 90.377 [↑](#footnote-ref-8)
9. US DoT Connected Vehicle Pilot Deployment Program <https://www.its.dot.gov/pilots/> [↑](#footnote-ref-9)