**Before the  
US Department of Transportation**

**Washington, D.C. 20554**

In the Matter of

V2X Communications -” Notice of Request for Comments (RFC)”; Docket No. DOT-OST-2018-0210

To:

Mr. Finch Fulton

Deputy Assistant Secretary for Transportation Policy Office of the Secretary (OST)

U.S. Department of Transportation (DOT)

1200 New Jersey Avenue S.E.

Washington, DC 20590

**COMMENTS OF IEEE 802**

Paul Nikolich

Chair, IEEE 802 LAN/MAN Standards Committee

em: IEEE802radioreg@ieee.org

[Month, Day, Year filed]

1. Introduction

IEEE 802 LAN/MAN Standards Committee (LMSC) is pleased to provide comments in the above-captioned proceeding.

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)

1. Answers to questions asked in the Request for Comments
2. Please provide information on what existing or future technologies could be used for V2X communications, including, but not limited to, DSRC, LTE C-V2X and 5G New Radio. What are the advantages and disadvantages of each technology? What is the timeframe for deployment of technologies not yet in production? Please provide data supporting your position.
   * Look at 18-18-0159r6; pull section 3 and update for this. (includes PAR info)
3. Of the V2X communications technologies previously discussed, at present only DSRC is permitted to be used in the 5.9 GHz spectrum band for transportation applications. If that allocation were to be changed to allow any communication technology for transportation applications, could DSRC and other technologies (*e.g.*, C-V2X, 5G or any future technology) operate in the same spectrum band or even the same channel without interference? Why or why not? If there are any technical challenges to achieving this goal, what are they and how can they be overcome?
   * Look at 18-18-0159r6; pull section 2 or 3 and update for this
   * Safety msgs available to all..
   * 11-18/1323r2, page 5; see what we can pull into here.
4. To what extent is it technically feasible for multiple V2X communications technologies and protocols to be interoperable with one another? Why or why not? Can this be done in a way that meets the performance requirements for safety of life applications, as they were discussed in the V2V NPRM? What additional equipment would be needed to achieve interoperability or changes in standards and specifications? What is the projected cost of any necessary changes? How soon can these changes and equipment prototypes be available for testing?
   * NGV has started, that is all we can say for now. cost of going to next evolution 11p and NGV will be lower with the backward compatibility .
     + We want to stress the interoperable with all and backward compatibility is needed.
     + get definitions of these from NGV
   * no formal reply comments, so could do an ex parte, to respond to other companies/orgs comments.
   * there is still the rule process that will be another round of comments.
   * cross technologies focus
5. To what extent is it technically feasible for different generations of the same V2X communications technologies and protocols to be interoperable with one another? Why or why not? Can this be done in a way that meets the performance requirements for safety of life applications? What additional equipment or changes in standards and specifications would be needed to achieve interoperability? What is the projected cost of any necessary changes?
   * compared to above, adjust answers.
   * ~~are there any other generations out their, maybe not?~~
6. Even if they are interoperable across different technologies and generations of the same technology, would there be advantages if a single communications protocol were to be used for V2V safety communications? What about other V2X safety applications, such as those involving V2I and V2P communications?
   * yes.
   * it seems is it too late for V2V, but open to V2I/V2P?
   * how do they define V2I and V2P? These are much more complex.
     + V2I has many applications, how to differentiate
     + PHY and MAC maybe the same, the application layer is where they digress.
       - though depending on functionality could a different PHY provide an enhanced service. more discussion/ may be early on this yet. e.g. data needed and latency differences
     + V2P – when will mobile devices have 11p/NGV
   * could they be looking at a single tech. for safety and then maybe multiple tech. for non-safety?
   * so can it be interoperable and still advance the functionality and safety… it is a goal of NGV.
     + 11-18/1323r2, page 5; see what we can pull into here.
   * privacy and security has to be considered, over time. this is an eternal process over time
7. How would the development of alternative communication technologies affect other V2I and V2P communications, such as those supporting mobility or environmental applications? Do these applications have the same or different interoperability issues as V2V safety communications? Do different V2X applications (e.g., platooning) have different communication needs, particularly latency?
   * should keep all 3 we should have in the same systems/network.
   * should not expect latency differences between these.
   * do we pull in other transportation, e.g. rail?
   * BW, latency(DSRC s better than other technologies) and reliability all translate into what can be done for platooning.
8. Do different communication technologies present different issues concerning physical security (i.e., how to integrate alternative communication technologies into vehicle systems), message security (i.e., SCMS design or other approaches), or other issues such as cybersecurity or privacy? Would these concerns be affected if multiple but still interoperable communication technologies are used rather than one?
   * yes, ……….
   * if different vehicles have different tech can ID them, so not as private.
   * borders need to considered also.
9. How could communications technologies (DSRC, C-V2X, 5G or some other technology) be leveraged to support current and emerging automated vehicle applications? Will different communication technologies be used in different ways? How?
   * there are automated applications being standardized to operate over DSRC and NGV. SAE and ETSI. there is growth path with DSRC/NGV to enhance existing and future applications. >> this is more than just for automated applications. be sure it is covered in the other questions where appropriate.
   * no comment on 2nd question
10. How could deployments, both existing and planned, assess communications needs and determine which technologies are most appropriate and whether and how interoperability could be achieved?
    * capability indications on who is in the neighborhood and how to communicate with them. this works best if on same channels and protocol, etc., e.g. NGV has.
11. Conclusion

IEEE 802 LMSC would like to thank the US Department of Transportation the opportunity to respond to their consultation on V2X.

Regards,

By: \_\_\_\_

Paul Nikolich

IEEE 802 LAN/MAN Standards Committee Chairman

em: IEEE802radioreg@ieee.org

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)