Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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

REPLY OF T-MOBILE USA, INC.

T-Mobile USA, Inc. ("T-Mobile")\(^1\) submits this reply in response to the comments filed in support of the Petitions for Reconsideration of the 5G Automotive Association ("5GAA") and the Alliance for Automotive Innovation ("AAI") (together, the "Petitions")\(^2\) of the First Report and Order in the above-referenced proceeding.\(^3\) T-Mobile agrees with the goals of both Petitions, which seek to ensure that (i) Cellular Vehicle-to-Everything ("C-V2X") operations in the upper 30-megahertz portion (5.895-5.925 GHz) of the 5.850-5.925 GHz ("5.9 GHz") band are protected from unwanted emissions from unlicensed devices that operate in the lower 45-megahertz portion (5.850-5.895 GHz) of the band (the "U-NII-4 band"); and (ii) there is sufficient spectrum to support intelligent transportation systems ("ITS") applications now and in the future.\(^4\) The issues raised in the Petitions are substantially related to questions presented by the Commission in the Further Notice in this proceeding. Accordingly, the Commission should set aside its decisions in the First Report and Order now so that it can address the concerns

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\(^{1}\) T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.


\(^{4}\) See 5GAA Petition at 3-11; AAI Petition at 2-9.
presented in the Petitions as part of a more comprehensive assessment of the rules that should govern the 5.9 GHz band.

I. THE COMMISSION SHOULD CAREFULLY CONSIDER THE OUT-OF-BAND EMISSIONS LIMITS FOR THE 5.9 GHz BAND

5GAA asks the Commission to reconsider the out-of-band emissions (“OOBE”) limits adopted in the First Report and Order for client devices and indoor unlicensed access points operating in the U-NII-4 band. Instead of the adopted OOBE limit of -27 dBm/MHz at or above 5.925 GHz for U-NII-4 client devices and -7 dBm/MHz at or above 5.925 GHz for indoor access points, 5GAA proposes that the Commission afford C-V2X an additional 20 dB of protection – in other words, adopt OOBE limits of -47 dBm/MHz and -27 dBm, respectively.

The responses to the 5GAA Petition highlight that there are serious questions regarding whether the OOBE limits adopted in the First Report and Order are appropriate. For example, Qualcomm notes that the adopted OOBE limits permit 30 to 40 dB more unwanted emissions than are currently allowed for U-NII-3 (5.725-5.850 GHz) devices operating at the lower edge of the 5.9 GHz band, which will cause harmful interference to C-V2X operations. FCA observes that the adopted OOBE limits “will significantly reduce C-V2X’s communications range . . . [and] will significantly degrade C-V2X’s ability to support critical safety applications on a reliable basis.” FCA therefore urges the Commission to remedy these potential harms by

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5 See 5GAA Petition at 3-8.
6 See First Report and Order and FNPRM ¶¶ 80-83.
7 See 5GAA Petition at 2, 7.
adopting 5GAA’s proposal. AAI similarly requests that the Commission amend the OOBE limits, as proposed by 5GAA, to provide “extra protection” for C-V2X services.

Notably, the Commission sought comment on the appropriate OOBE limits for outdoor unlicensed operations in the Further Notice. Interested parties have likewise questioned the proposed limit there. For example, 5G Americas urges the Commission to adopt an OOBE limit no greater than -27 dBm/MHz at the 5.895 GHz edge in order to match the OOBE limits that the Commission adopted for outdoor unlicensed operations in the 6 GHz band. AT&T agrees, requesting that the Commission adopt OOBE limits that support and protect road safety applications, despite potential “inconveniences or limitations to unlicensed use.”

While it may be reasonable to have different OOBE limits for indoor and outdoor operations, the Commission should take a more comprehensive approach to OOBE limits and refrain from finalizing the OOBE limits for indoor operations without fully considering the overlapping issues raised in both the Further Notice and the Petitions. And whatever emissions limits the Commission adopts, T-Mobile strongly agrees that C-V2X operations must be protected from harmful interference by unlicensed devices. Adopting appropriate OOBE limits

ranges could mean that delivery of critical safety warnings is delayed, which would give a driver less time to react to traffic or road hazards.”).

10 See FCA Comments at 3.
11 See AAI Comments at 4.
12 See First Report and Order and FNPRM ¶¶ 163-64.
is a key component of the Commission’s rules that will allow C-V2X operations to flourish – a significant driver of the Commission’s decision to reallocate the 5.9 GHz band in the first place.

II. THE COMMISSION SHOULD ENSURE THERE IS SUFFICIENT SPECTRUM FOR LICENSED C-V2X OPERATIONS

One of the issues raised in the AAI Petition is whether the Commission should have reallocated existing ITS spectrum in the 5.9 GHz band for unlicensed operations. AAI urges the Commission to reconsider its decision to allocate the lower 45 megahertz of the band for unlicensed operations and, instead, designate the entire 5.9 GHz band for automotive safety applications. Similar to OOBE limits, issues related to the appropriate amount of spectrum for automotive safety functions are also under consideration in the Further Notice. There, the Commission requested comment on whether it should allocate additional spectrum for ITS applications.

Commenters in response to both the Petitions and the Further Notice agree that the 30 megahertz of 5.9 GHz band spectrum dedicated for C-V2X operations is insufficient. 5GAA’s comments on AAI’s Petition, for instance, explain that C-V2X’s advanced safety applications require a significant amount of data, which “cannot be accommodated” with the current amount of spectrum allocated in the 5.9 GHz band. And several parties in response to the Further Notice note that additional spectrum is needed not only for today’s C-V2X operations, but also for future applications. AAI, for example, points out that C-V2X requires at least 75 megahertz

16 See AAI Petition at 2, 8-9.
17 See id.
18 See First Report and Order and FNPRM ¶¶ 189-92.
20 See, e.g., Comments of the Intelligent Transportation Society of America, ET Docket No. 19-138, at 15 (filed June 2, 2021) (“ITS America believes the record before the Commission overwhelmingly demonstrates the need for at least the 75 MHz of spectrum for V2X.”); Comments of the University of
of spectrum to realize its full benefits.\textsuperscript{21} The National Safety Council argues that allocating less than the entire 75 megahertz of the 5.9 GHz band for C-V2X undermines C-V2X’s ability to significantly improve road safety.\textsuperscript{22}

Instead of finalizing its decision to reallocate the lower 5.9 GHz band for unlicensed use, the Commission should first determine whether additional spectrum is needed for C-V2X. If the Commission finds that additional spectrum is required, it should assess whether the lower 5.9 GHz band can fulfill those requirements before turning to other bands. Indeed, the lower 45 megahertz of the 5.9 GHz band may be best suited to meet the very needs that the Commission speculates could be met by other spectrum bands in the \textit{Further Notice}.

For any spectrum it designates for ITS operations, the Commission should, as it has for the upper 5.9 GHz band, make clear that the ITS service requires the use of C-V2X technologies. As commenters recognize, “C-V2X has emerged as the transportation industry’s preferred V2X solution.”\textsuperscript{23} And, when combined with 5G wireless networks, C-V2X technologies can help unleash important improvements in safety, traffic efficiency, mobility, and energy efficiency on America’s roads, and facilitate U.S. global leadership in connected cars.

\textsuperscript{21} Michigan Transportation Research Institute, ET Docket No. 19-138, at 3 (filed June 2, 2021) (“UMTRI believes the record before the FCC overwhelmingly demonstrates the need for at least 75 MHz of spectrum for V2X, and we have been using all 75 MHz for the Ann Arbor Connected Environment, until the FCC banned us from doing so.”).

\textsuperscript{22} Comments of the Alliance for Automotive Innovation, ET Docket No. 19-138, at 9 (filed June 2, 2021).

\textsuperscript{23} See Letter from Lorraine Martin, President and CEO, National Safety Council, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 19-138, at 2-3 (filed June 2, 2021).

\textsuperscript{23} FCA Comments at 1.
III. CONCLUSION

The record demonstrates that the issues raised in the petitions for reconsideration of the *First Report and Order* are inextricably intertwined with the questions raised in the *Further Notice*. Accordingly, before finalizing any OOB limits for indoor use of unlicensed devices in the 5.9 GHz band and determining whether 30 megahertz of spectrum in the 5.9 GHz band is sufficient for C-V2X applications – decisions made in the *First Report and Order* – the Commission should thoroughly review the comments filed in response to the Petitions as well as those filed in response to the *Further Notice*. Doing so will enable the Commission to take a more holistic and informed approach to its decision-making regarding the 5.9 GHz band.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Geanette A. Foster, hereby certify that on August 2, 2021 a copy of the foregoing Reply by T-Mobile USA, Inc. was served by First Class U.S. Mail or electronic mail1 upon the following:

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1 See 47 C.F.R. § 1.429(g). Pursuant to Section 1.47(d) of the Commission’s rules, the party to be served may agree to accept service in an alternative form. See id. § 1.47(d). Counsel for the identified parties has agreed to service by electronic mail of this Reply.