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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

COMMENTS OF DYNAMIC SPECTRUM ALLIANCE

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DSA
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COMMENTS

The Dynamic Spectrum Alliance ("DSA")[1] welcomes the Federal Communications Commission's ("FCC" or "Commission") Notice of Proposed Rulemaking on the 5.9 GHz band (NPRM)[2]. Existing unlicensed spectrum used for Wi-Fi is already overburdened in many locations, with users experiencing congestion at peak busy hours. The projected near-term growth in Wi-Fi enabled devices and hotspots,[3] when combined with the quantified Wi-Fi spectrum shortfall by 2025 identified in recent studies,[4] indicate that the country needs a significant expansion in the amount of available unlicensed spectrum just to keep pace with existing technologies, and will need even more unlicensed spectrum to support the new and innovative uses that will maintain U.S. technological leadership.

The Commission proposes to segment the 5.850-5.925 GHz frequency band between unlicensed use in the lower 45 MHz and Intelligent Transportation Systems ("ITS") in the upper 30 MHz. The additional 45 MHz, among other things, will allow for a new high-capacity 80 MHz and a new high-capacity 160 MHz channel for unlicensed use. The 160 MHz channel will be the only channel of that bandwidth operating in the 5 GHz band that does not require incorporating

[1] The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small- and medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members/.
[2] *See Use of the 5.850-5.925 GHz Band*, Notice of Proposed Rulemaking, ET Docket No. 19-138, FCC 19-129 (released December 17, 2019) ("NPRM").
[3] Cisco Systems Inc., *Cisco Annual Internet Report (2018–2023)*, pp. 13-15. https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html
[4] *See* Steve Methley & William Webb, Quotient Assocs. Ltd., *Wi-Fi Spectrum Needs Study* (Feb. 2017); Rolf de Vegt et al., Qualcomm Techs., Inc., *A Quantification of 5 GHz Unlicensed Band Spectrum Needs* (2017).

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Dynamic Frequency Selection to access the spectrum and operation under the corresponding lower EIRP limits.

To be clear, the Commission's proposal if adopted by itself, will not meet the projected demand for new mid-band spectrum for unlicensed use. Meeting the projected need for Wi-Fi and other unlicensed uses requires the Commission to take actions in the 6 GHz band.

Consistent with the finding of the Rand Study,[5] the availability of these large bandwidth channels will provide direct economic benefits to the U.S. economy through increase in GPD, consumer surplus and producer surplus. Even though the Commission is proposing to make available 45 MHz for unlicensed use, the Rand Study Approach 1 (Aggregate Contribution to GDP from Large-Bandwidth Channels) still holds as the incremental benefits are based on the new 80 and 160 MHz channels created for unlicensed use. The same number of new 80 and 160 MHz channels are created under the Commission's segmentation plan as would be created if the entire 75 MHz were made available for unlicensed use. With respect to Approach 2 (Valuation of the Additional Spectrum Capacity), the analysis is based on the full 75 MHz of spectrum being repurposed for unlicensed use. In this instance, the Commission's segmentation plan does impact the range of potential contributions to GDP. Our assessment is that the range of values need to be multiplied by 0.6 to reflect that there will only be 45 MHz of spectrum (rather than 75 MHz of spectrum for unlicensed use).[6]

[5] Diana Gehlhaus Carew, Nicholas Martin, Marjory S. Blumenthal, Philip Armour, Jesse Lastunen, *The Potential Economic Value of Unlicensed Spectrum in the 5.9 GHz Frequency Band*, RAND Corporation, ET Docket No. 13-49 (filed Dec. 13, 2018) ("RAND Study") https://www.rand.org/pubs/research_reports/RR2720.html.

[6] The study authors estimate that the contribution to GDP, assuming the entire 75 MHz band is authorized for unlicensed use, and accounting for different scenarios across both approaches, ranges between $59.8 billion (Approach A) and $105.8 billion (Approach B). As noted above, if only 45 MHz of spectrum is made available for unlicensed use, there is no change in the contribution to GDP in

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In an earlier proceeding on the 5.9 GHz band, the DSA filed comments in favor of a re-channelization plan for the 5.9 GHz band whereby the Dedicated Short Range Communications ("DSRC") service safety channels would be moved to the 5895-5925 MHz band.[7] The Commission's segmentation proposal is similar in that it would relocate the ITS safety channels to the top 30 MHz of the band and rather than have the lower 45 MHz shared between non-safety ITS services and Wi-Fi, it proposes only unlicensed use within the sub-band segment. Thus, we are supportive of the Commission's band segmentation proposal.

The DSA also agrees in principle with the Commission proposal to extend the U-NII-3 technical rules to the U-NII-4 band. Having the same EIRP limits and power spectral density limits, for example, will simplify the design of Wi-Fi devices operating on the new 20, 40, 80, and 160 MHz channels that span the U-NII-3 and U-NII-4 bands to operate under a single set of technical rules. One technical rule, though, that presents a challenge to the practical implementation of the Commission's vision is the out-of-band emission (OOBE) limit. Our understanding from DSA members is that IEEE 802.11 compliant devices will not be able to meet the OOBE limit at the upper frequency edge of the ITS segment without a dramatic reduction in power.

The DSA agrees that licensed ITS systems must be protected from harmful interference. Much thought needs to be given to potential solutions, which while protecting the ITS system, could

Approach A, but Approach B needs to be adjusted to $63.48 billion to reflect the reduction in unlicensed spectrum. Alternatively, the authors found that dedicating the entire 75 MHz of the 5.9 GHz band for unlicensed use adds between $64.6 billion and $172.2 billion in consumer surplus and an additional $17.7 billion in producer surplus. With only 45 MHz for unlicensed use, these numbers need to be multiplied by 0.6.

[7] *See* Comments of the Dynamic Spectrum Alliance, ET Docket 13-49 at 2 (filed July 7, 2016).

unintentionally undermine the Commission's proposal for harmonizing the technical rules across the two bands under the U-NII-3 rules and effectively limit the economic benefits expected from segmenting the lower 45 MHz of the current U-NII-4 band for unlicensed access.

As the majority of Wi-Fi use is indoors, the Commission may want to examine having different OOBE limits depending on whether the unlicensed device is operated indoors or outdoors. Taking building entry loss and the physical separation from ITS systems into account for indoor devices should allow for significant relaxation in the emissions mask while maintaining robust protection for ITS communications.

It is important to note that the OOBE limit was established to protect weather Doppler radar below the U-NII-3 band and was applied uniformly to the frequencies above the U-NII-3 band. We question whether such a stringent mask is required to protect any ITS operations, especially C-V2X communications, which 5GAA[8], claims is more resilient to interference than DSRC. The Commission should determine the OOBE limit required for each of these ITS technologies in light of these claims.

Additionally, we also note that the 5GAA Petition (which is technically not being addressed in this NPRM) indicates 20 MHz is sufficient for introducing services that enable many important safety applications but that more spectrum needs to be allocated in the future to provide more advanced features of C-V2X.[9] In fact, as the NPRM makes clear, 5GAA believes that the C-V2X protocol provides an evolutionary path to 5G (and future generations of wireless technology) and

[8] *See* 5G Automotive Association Petition for Waiver, GN Docket No. 18-357 (filed Nov. 21, 2018) at 12. ("5GAA Petition") https://ecfsapi.fcc.gov/file/11212224101742/5GAA%20Petition%20for%20Waiver%20-%20Final%2011.21.2018.pdf.
[9] NPRM at ¶ 29.

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desires an additional 40 MHz channel (i.e., 60 MHz total) for advanced vehicular services.[10] It is not clear if these advanced vehicle services are safety related or if they are services that can be performed over licensed spectrum in other frequency bands. C-V2X may also seek to expand by commencing operations in the unlicensed segment proposed for the U-NII-4 band.

The Commission rightly thinks of spectrum for vehicular safety as a portfolio of spectrum holdings in different frequency ranges. Different vehicle safety functions should be performed in the spectrum band(s) where it makes most sense. To these ends, the DSA asks that the Commission consider a clean sheet approach when considering the best spectrum band in which to locate the proposed C-V2X operations. We believe it makes sense for the Commission to continue allowing a DSRC safety channel to operate in 5.905- 5.915 GHz (Channel 184) and authorize C-V2X to operate in the lightly used 4.9 GHz band. If C-V2X systems operate successfully in the 20 MHz within the 4.9 GHz band, there would be a clear path to reach a total 50 MHz of spectrum, allowing it to evolve toward 5G. While seemingly a more radical approach, it is one that could improve spectrum utilization and overall spectrum efficiency and bring the greatest economic benefits to the U.S. economy.

Respectfully submitted,

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[10] NPRM at ¶ 30.