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I. Introduction

As technology advances, so too must the Federal Communications Commission (“FCC” or “Commission”) and its regulatory regime. Over the last four years, the Commission has taken this mandate to heart, consistently updating or eliminating outdated rules that no longer make sense in the modern age.² This notice of proposed rulemaking (“NPRM”)³ represents the next step in the FCC’s continuing work to update its rules for the modern communications marketplace.

The 5.9 GHz band (5.850–5.925 GHz) has been set aside exclusively for vehicle safety since 1999,⁴ but since that time the communications and transportation marketplaces have evolved in some unexpected ways. Dedicated short range communications (“DSRC”), the lone technology authorized in the 5.9 GHz band, has not taken off as was projected.⁵ A competing vehicle-safety technology, cellular-vehicle-to-everything (“C-V2X”), has been developed.⁶ And the neighboring spectrum in the 5.8 GHz band has seen an unprecedented growth in usage, to the point where it is now the main workhorse for all Wi-Fi connections.⁷ Meanwhile, other countries around the world have developed their own plans for the 5.9

² See, e.g., Declaratory Ruling and Third Report and Order, *In the Matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, WT Docket No. 17-79 et al. (Sept 27, 2018). <https://bit.ly/2TP3hFQ>; Order on Reconsideration and Second Notice of Proposed Rulemaking, *In the Matter of 2014 Quadrennial Review — Review of the Commission’s Broadcast Ownership Rules Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996 et al.*, MB Docket No. 14-50 et al. (Nov. 16, 2017). <https://bit.ly/36Gj3G7>.

³ Notice of Proposed Rulemaking, *In the Matter of Use of the 5.850–5.925 GHz Band*, ET Docket No. 19-138 (Dec. 12, 2019) [“NPRM”]. <http://bit.ly/2PGGXve>.

⁴ *Id.* ¶ 3.

⁵ *Id.*

⁶ *Id.* ¶ 5.

⁷ *Id.* ¶ 6.

GHz band, some of which are very different from the FCC's current band plan. All these factors suggest that a second look at the rules governing use of the 5.9 GHz band is both appropriate and timely.

R Street supports the Commission's efforts in this proceeding to revise and update its rules governing the 5.9 GHz band. Enabling use of C-V2X technology in the 5.9 GHz band will help promote vehicle safety and could potentially prevent half a million crashes and save over a thousand lives per year.⁸ Shrinking the vehicle-safety allocation from 75 MHz to the upper 30 MHz will help concentrate and globally harmonize these vital services while also making room for a full 160-MHz-wide channel for Wi-Fi 6 in the bottom 45 MHz.⁹ Additionally, allowing unlicensed services like Wi-Fi and LTE-U to coexist with vehicle-safety services in a portion of the 5.9 GHz band could also help maximize the utility of the band.¹⁰ Of course, 5.9 GHz is not the only band available for vehicle safety, so the FCC should also look into additional frequencies—both low-band and high-band—that could support vehicle safety.¹¹ Altogether, these suggested reforms should substantially improve operations within the 5.9 GHz band.

II. Allowing C-V2X Services in the 5.9 GHz Band Will Help Promote Vehicle Safety

While DSRC appeared to be the key vehicle-safety technology of the future when it was originally authorized in the 5.9 GHz band, it is now clear that C-V2X may play an equal or

⁸ *Infra* Section II.

⁹ *Infra* Section III.

¹⁰ *Infra* Section IV.

¹¹ *Infra* Section V.

even greater role in vehicle safety going forward.¹² The 5G Automotive Association (“5GAA”) notes that C-V2X’s safety capabilities are superior to DSRC in certain respects such as non-line-of-sight performance and congestion control.¹³ The 5GAA also notes that C-V2X may be cheaper and quicker to deploy than DSRC, given its potential to build upon existing cellular infrastructure.¹⁴ We have already seen partnerships between major automakers and communications companies to deploy C-V2X trials around the country.¹⁵

However, these initial C-V2X deployments have all required special authorization from the FCC.¹⁶ Reallocating a portion of the 5.9 GHz band for C-V2X will eliminate this costly and time-consuming regulatory barrier, allowing innovators and entrepreneurs to more quickly deploy this potentially life-saving technology to American consumers. The FCC proposes to reallocate at least the upper 20 MHz of the 5.9 GHz band (5.905–5.925 GHz) for C-V2X, and perhaps also the 10 MHz below that (5.895–5.905 GHz).¹⁷ Depending on the availability of other spectrum bands to support DSRC, reallocating the upper 30 MHz entirely to C-V2X may be sensible, but if no other bands are available to support DSRC then maintaining a 10 MHz allocation for that technology in the 5.9 GHz band would be

¹² NPRM ¶¶ 24–25.

¹³ *Id.* ¶ 25.

¹⁴ *Id.*

¹⁵ See, e.g., Monica Allevan, *Qualcomm, Audi to Conduct C-V2X Pilot on Virginia Roads*, FIERCEWIRELESS (Jan. 22, 2020), <http://bit.ly/2VF77m0>; Monica Allevan, *Ford Reinforces Its Commitment to C-V2X, Plans Demos at CES with Qualcomm*, FIERCEWIRELESS (Jan. 7, 2019), <http://bit.ly/3ahdSP0>.

¹⁶ See Press Release, Fed. Commc’ns Comm’n, *Chairman Pai Statement on Announcement of New C-V2X Deployment in 5.9 GHz Band* (Jan. 22, 2020), <http://bit.ly/2VJbPir> (“Today’s C-V2X deployment announcement was only made possible through an experimental license. That’s because the current rules governing the 5.9 GHz band lock us into DSRC, a technology authorized by the FCC more than twenty years ago that has never been widely deployed.”).

¹⁷ NPRM ¶¶ 24–31.

advisable, since it is still impossible to know which technology will be more successful once deployed at scale. But, as discussed below, vehicle safety should be the FCC's only concern with the 5.9 GHz band. To the extent calls for additional spectrum in the 5.9 GHz band to support "advanced vehicular services" are intended to provide non-safety-related services,¹⁸ these calls should be rejected.

III. The Commission Can Ensure Vehicle-Safety Technologies Have Enough Bandwidth to Develop While Still Reallocating a Portion of the 5.9 GHz Band for Unlicensed Use

Vehicle safety is clearly of vital importance. However, the FCC rightly notes that it is only these safety-related technologies that deserve interference protection.¹⁹ Additional technologies—like in-car entertainment, for example—may have significant value, but they are no more deserving of interference protection than the other technologies that utilize unlicensed spectrum bands, like Wi-Fi. Thus, in this proceeding the FCC should focus on vehicle safety, decide how much of the 5.9 GHz band is needed to support vehicle-safety services, and then reallocate any remaining spectrum for unlicensed services.

To understand how much spectrum is needed to support vehicle-safety services, it is useful to consider how other countries have approached this issue.

A. The 5.895–5.925 GHz Band will be the Core of Vehicle-Safety Services Going Forward

Services like DSRC and C-V2X will undoubtedly be crucial to vehicle safety going forward, potentially preventing half a million crashes and saving over a thousand lives per

¹⁸ *Id.* ¶ 30.

¹⁹ NPRM ¶ 23.

year.²⁰ However, as international spectrum allocations for vehicle-safety technology in the 5.9 GHz band indicate, the current U.S. allocation provides significantly more bandwidth than necessary for these technologies to develop.

In the United States, a full 75 MHz of the 5.9 GHz band is allocated for vehicle safety. This is more spectrum than any other country has allocated for vehicle-safety services in the 5.9 GHz band:

- Europe (50 MHz, 5.875–5.925 GHz)²¹
- China (20 MHz, 5.905–5.925 GHz)²²
- Singapore (50 MHz, 5.875–5.925 GHz)²³
- Australia (70 MHz, 5.855–5.925 GHz)²⁴
- Korea (70 MHz, 5.855–5.925 GHz)²⁵

In fact, the only country that has allocated more spectrum for vehicle-safety services is Japan (80 MHz),²⁶ and that is in the neighboring 5.8 GHz band (5.770–5.850 GHz), which is only available in Japan because every other country uses this band for unlicensed services like Wi-Fi. For everyone else, there is an average of just over 50 MHz of spectrum allocated

²⁰ See Heidi R. King, Deputy Admin., Nat'l Highway Traffic Safety Admin., "Traffic Safety and the 5.9 GHz Spectrum," *U.S. Dept. of Transp.* (June 3, 2019), <http://bit.ly/3bWJ87A>.

²¹ "White Paper on ITS Spectrum Utilization in the Asia Pacific Region," 5G Auto. Ass'n, at 5 (July 2018), <http://bit.ly/2VdruX1>. Europe has also allocated an additional 20 MHz (5.855–5.875 GHz), but for non-safety-related services. *Id.*

²² *Id.* at 6.

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

for vehicle safety in the 5.9 GHz band, with the upper 20 MHz (5.905–5.925 GHz) the only spectrum in common use across all countries.

With every other country getting by with less, that is a good indication that the FCC has allocated too much spectrum for vehicle safety in the 5.9 GHz band. Therefore, there is a strong case for the FCC to shrink its existing spectrum allocation for vehicle-safety services to focus on the upper portion of the 5.9 GHz band, which will be in common use across almost every country. A mere 20 MHz allocation may be enough, but the proposed allocation of 30 MHz (5.895–5.925 GHz) should be adequate to support vehicle safety going forward.

Adopting this proposal would also more closely harmonize the 5.9 GHz band with what other countries have done—allowing automakers around the world to build a single safety system compatible across multiple countries, rather than building separate systems that each utilize different frequencies depending on the country. Some people may not be happy with this,²⁷ but in the context of global spectrum harmonization it is clearly a sensible approach.

B. Reallocating the 5.850–5.895 GHz Band for Unlicensed Services Will Make Room for the First Full 160-MHz-Wide Channel for Wi-Fi 6

Harmonizing the 5.9 GHz band with international vehicle-safety allocations would allow, as the NPRM proposes, the Commission to shrink the existing allocation for vehicle safety from 75 MHz to 30 MHz and make more unlicensed spectrum available for services like Wi-Fi.²⁸ These steps should benefit consumers in multiple ways.

²⁷ See, e.g., Eugene Mulero, *ITS American Not Happy with FCC's 5.9 GHz Spectrum Proposal*, TRANSPORT TOPICS (Jan. 13, 2020), <http://bit.ly/39QzMIH>.

²⁸ NPRM ¶ 2.

Neighboring spectrum in the 5.8 GHz band is already allocated for unlicensed services, but expanding that allocation by adding another 45 MHz will enable the next generation of Wi-Fi services (i.e., Wi-Fi 6) to use the full 160 MHz-wide channels that it is designed for, without any additional interference-mitigation requirements (such as Dynamic Frequency Selection or Automated Frequency Coordination).²⁹ That added bandwidth and next-generation Wi-Fi will translate into vastly improved speeds for consumers (gigabits per second), as well as a platform for innovators and entrepreneurs to develop new technologies that take advantage of those improved capabilities, like wireless AR/VR headsets.³⁰

This will substantially benefit both industry and consumers. With relatively small costs to vehicle safety and substantial benefits to unlicensed operations, the Commission's proposal would be a prudent course of action.

IV. The Commission Should Consider the Viability of Unlicensed Coexistence in Some or All of the 5.9 GHz Band

The Commission has already begun exploring the viability of unlicensed services coexisting with vehicle-safety technology,³¹ and “ongoing testing has shown promising results.”³² Such coexistence could be explored further going forward.

The coexistence testing thus far has focused on whether DSRC can share spectrum with Wi-Fi,³³ which makes sense because only DSRC has been authorized for use in the 5.9 GHz

²⁹ *Id.* ¶ 14.

³⁰ See, e.g., Vijay Nagarajan, *160 MHz Channels: The Wi-Fi 6 Superhighway*, BROADCOM (Aug. 23, 2019), <http://bit.ly/2SQVXZH>.

³¹ NPRM ¶ 7.

³² *Id.* ¶ 10.

³³ *Id.* ¶ 7.

band, and both DSRC and Wi-Fi are 802.11 standards developed by IEEE.³⁴ The Commission rightly notes that DSRC and C-V2X are incompatible standards,³⁵ but C-V2X may be compatible with Wi-Fi or unlicensed cellular technologies developed by 3GPP, like LTE-U and 5G Unlicensed. As Cisco explains, “[i]f C-V2X units were commercially available, Cisco sees no technical bar to developing a detect and vacate proposal” for that technology.³⁶

Implementing a system to enable unlicensed services to coexist with DSRC and C-V2X would be complicated, time-consuming and costly. And even if it is successful, it would place heavier burdens on power consumption.³⁷ The technology for a shared regime is feasible, so the question for the FCC is whether the benefits of achieving such coexistence would outweigh the costs of enabling it.

The Commission tentatively concludes that the costs of enabling such coexistence would outweigh the benefits, based primarily on the delay that coexistence testing would require.³⁸ R Street agrees that a delay in reallocating the bottom 45 MHz for unlicensed services would impose significant costs, since Wi-Fi 6 technology is ready to deploy now.³⁹ However, if equipment makers want to continue testing for potential coexistence in the upper 30 MHz, that should be allowable. Practically speaking, a sharing regime could be

³⁴ *Id.* ¶ 5 n.12.

³⁵ *Id.* ¶ 5.

³⁶ Comments of Cisco Systems, Inc., *In the Matter of Phase I Testing of Prototype U-NII-4 Devices*, ET Docket No. 13-49, at 7 (Nov. 28, 2018), <https://bit.ly/3as10rZ>.

³⁷ *Id.*

³⁸ NPRM ¶ 10.

³⁹ See, e.g., Ry Crist, *Wi-Fi 6: Better, Faster Routers are Here—Here’s What you Need to Know*, CNET (Nov. 30, 2019), <https://cnet.co/39qIeyi>.

built into the proposal as written. If the Commission adopts the reallocation proposal in the NPRM, it could still allow for continued testing for unlicensed coexistence in the remaining 30 MHz dedicated to vehicle-safety technologies. This would allow the Commission to revisit the band in the future if this testing proves the feasibility of such coexistence.

Regardless of the path the Commission takes, it should remain mindful that technological development facilitates more efficient use of the radio spectrum. Understanding that, the Commission should not foreclose possible future sharing regimes between unlicensed and licensed services, including vehicle safety.

V. The Commission Should Identify Other Bands Suitable for Vehicle Safety

Finally, the Commission should explore other bands that could accommodate vehicle-safety technology,⁴⁰ as the 5.9 GHz band is not the only spectrum band in which vehicle-safety services can be deployed. Japan, for instance, has deployed DSRC in 10 MHz of the 700 MHz band,⁴¹ while Europe is planning future vehicle-safety deployments in the 63–64 GHz band.⁴² And the FCC has already allocated the 76–81 GHz band for vehicular radar systems, which can be used to support automatic emergency braking systems and adaptive cruise control systems.⁴³ While 5.9 GHz has long been allocated for vehicle safety, there is nothing stopping the Commission from finding alternative spectrum bands for the technology.

⁴⁰ NPRM ¶¶ 59–62.

⁴¹ 5GAA White Paper, *supra* note 21, at 6.

⁴² *Id.* at 5.

⁴³ NPRM ¶ 4.

And if vehicle safety were moved out of the 5.9 GHz band, that would allow the full 75 MHz to be allocated to unlicensed use, potentially bridging the 5.8 GHz band, the 5.9 GHz band and the 6 GHz band to form a Wi-Fi superhighway.⁴⁴ This course could make sense for the Commission because the additional benefits of unlicensed use in the 5.9 GHz band stem largely from its proximity to neighboring unlicensed bands. By opening the entire 75 MHz of the 5.9 GHz band, unlicensed operators will be better able to utilize these existing operations to their fullest capacity.

We commend the Commission's actions to promote efficient use of the radio spectrum. It is clear that current allocations in the 5.9 GHz bands should be revisited, and the above options are all worth considering. While facilitating the development of vehicle-safety technologies remains of paramount importance, allowing the full 75 MHz of the 5.9 GHz band to remain underutilized prevents the deployment of highly productive services while providing little benefit that could not otherwise be achieved with a smaller portion of the band.

Respectfully submitted,

_____/s/_____

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⁴⁴ Jeffrey Westling, *Unleashing Unlicensed Innovation*, INSIDE SOURCES (Nov. 21, 2019), <https://bit.ly/38kiv9H>.