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October 16, 2018

Ex Parte

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band,*
ET Docket No. 13-49

Dear Ms. Dortch:

It is well-accepted that the United States needs more unlicensed spectrum. Consumers, companies, and institutions increasingly rely on unlicensed technologies to connect, produce, and access information. This has made unlicensed bands among the most productive commercial frequencies available and has resulted in tremendous innovation and investment. But we are nearing a Wi-Fi spectrum crisis in existing unlicensed bands. Without decisive Commission action, these benefits are at risk.

The 5.9 GHz band is the best opportunity to fill the accelerating need for mid-band unlicensed spectrum. Its position immediately adjacent to the world's most important existing unlicensed band means that the country can bring it into use quickly and produce the wide channels needed for the next generation of Wi-Fi. And because there are very few incumbent deployments in the band, which today is saddled with over-regulatory, technology-specific rules, the Commission would not have to impose extensive co-existence regulations that could limit deployments and utility. Furthermore, because of these benefits, deregulating the 5.9 GHz band by opening it for unlicensed use would also be an essential step in advancing 5G and the next generation of broadband. The time has come to recognize that Dedicated Short Range Communications (DSRC) technologies' use of this band has failed, and that the country can no longer afford to hold 75 megahertz of optimal spectrum in reserve with the hope that the next twenty years will somehow be different than the last two decades of stagnation.

NCTA therefore requests that the FCC conclude its 5.9 GHz proceeding, which has been pending for more than five years. To move this proceeding toward resolution, the Commission should issue a Further Notice of Proposed Rulemaking or other appropriate vehicle that: (1) recognizes that the heavy-handed, technology-specific rules of the past have failed, (2) proposes

to open all or a sufficient portion of the band to promote unlicensed innovation and investment, and (3) considers how to more flexibly address the need for low-power, point-to-point connectivity in the automotive sector using one or more alternative spectrum bands.

The country needs more unlicensed spectrum to support economic growth and innovation. As comments across many Commission proceedings make clear, American consumers and businesses need additional mid-band Wi-Fi spectrum as soon as possible, just to keep pace with today’s consumer and enterprise needs.¹ One study by Quotient Associates for the Wi-Fi Alliance concludes that the United States will need between 788 megahertz and 1.6 gigahertz of new mid-band unlicensed spectrum by 2025 to accommodate growing demand for Wi-Fi.² Another study by Qualcomm, using a completely different methodology, comes to the same conclusion: “regulators should plan for around 1280 MHz of unlicensed spectrum centered around the 5 GHz band for use by unlicensed technologies.”³ Wi-Fi already securely carries medical telemetry in hospitals, hundreds of billions of dollars in financial transactions daily, important machine communications, and many other crucial services on which people depend in their everyday lives. Because of this growing reliance, Wi-Fi will play an increasingly important role in the delivery of next-generation broadband technologies like growing Internet of Things applications and 5G.

Congress has recognized this growing need. The MOBILE NOW Act, signed by the President on March 23, 2018, requires the FCC and NTIA to begin closing that gap by identifying at least 100 megahertz of new spectrum below 8 GHz for unlicensed use.⁴ Making the 5.9 GHz band available for unlicensed use would be an important first step in meeting this requirement.

¹ Comments of All Points Broadband, Amplex Internet, Apple, Blaze Broadband, Broadcom, Cambium Networks, Cisco Systems, Cypress Semiconductor, Dell, Extreme Networks, Facebook, Fire2Wire, Google, Hewlett-Packard Enterprise, HP, Intel, Joink, Mediatek, Metalink Technologies, Microsoft, New Wave Net, Pixius Communications, Qualcomm, Rise Broadband, Ruckus, A Unit of Brocade, Snappy Internet, Sony Electronics, Western Broadband, Wireless Internet Service Provider Association, Wisper ISP, GN Docket No. 17-183, at 5-7 (filed Oct. 2, 2017); Comments of Dynamic Spectrum Alliance, GN Docket No. 17-183, at 11-12 (filed Oct. 2, 2017); Comments of the Mid-Band Spectrum Coalition, GN Docket No. 17-183, at 9 (filed Oct. 2, 2017); Comments of Wi-Fi Alliance, GN Docket No. 17-183, at 5-6 (filed Oct. 2, 2017).

² Steve Methley & William Webb, Quotient Assocs. Ltd., *Wi-Fi Spectrum Needs Study* 26, 28 (Feb. 2017). The study makes a range of predictions; the numbers cited assume that only 30% of the unlicensed spectrum that is burdened by Dynamic Frequency Selection rules is utilized by 2025.

³ Rolf de Vegt et al., Qualcomm Techs., Inc., *A Quantification of 5 GHz Unlicensed Band Spectrum Needs* 5 (2017).

⁴ See 47 U.S.C. § 1502(a)(2)(A).

Additional mid-band spectrum in particular is necessary for the United States to keep pace with the rest of the world in the race for the next generation of communications technologies.⁵ Broadband providers have invested billions of dollars and now deliver Gigabit broadband to the home. But unless Wi-Fi has the spectrum it needs to distribute Gigabit capacity to Americans' devices, these broadband investments will fail to deliver the promise of advancing ultra-high-speed broadband connectivity and the Internet of Things to consumers. The 2.4 GHz band—long a workhorse for Wi-Fi—is absolutely congested; so much so that equipment vendors say it can no longer be relied upon for enterprise applications.⁶ Additionally, while the latest Wi-Fi standards (IEEE 802.11ac, and next-generation 802.11ax), which operate in the 5 GHz band, can deliver Gigabit speeds, these technologies require wide-bandwidth, 160-megahertz channels to do so. Unfortunately, today, Americans have no access to a contiguous 160-megahertz channel unconstrained by burdensome Dynamic Frequency Selection limitations. Moreover, additional spectrum is essential to unleash the enhanced capabilities of 5G. No other band is better situated than 5.9 GHz to accomplish this.

Continuing to reserve 75 megahertz of mid-band spectrum based on the hope that DSRC will someday become viable wastes valuable spectrum resources. While Wi-Fi demand and reliance only continues to grow, DSRC has failed in the marketplace. After nearly twenty years, despite being granted exclusive spectrum and being heavily subsidized by the government, incumbent DSRC services remain largely in the pilot phase. And as the Department of Transportation noted in its recent guidance, other vehicle safety and commercial technologies are actively being developed by the industry today.⁷ These market-driven alternatives are on the verge of overtaking DSRC in the marketplace, but even those that rely on spectrum lack the

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- ⁵ See Remarks of Ajit Pai, Chairman, FCC, White House 5G Summit, Washington, D.C. (Sept. 28, 2018) (“The FCC has been extremely aggressive in making more airwaves available for the commercial marketplace. . . . We’re exploring how to repurpose mid-band spectrum for new wireless applications, from rural broadband coverage to the next generation of Wi-Fi.”), <https://www.fcc.gov/document/chairman-pai-remarks-white-house-5g-summit>; Remarks of David J. Redl, Assistant Secretary for Communications and Information, White House 5G Summit, Washington, D.C. (Sept. 28, 2018) (“Perhaps the single most important action government can take to help lay a foundation for 5G is ensuring sufficient and flexible access to spectrum.”), <https://www.ntia.doc.gov/speectestimony/2018/remarks-assistant-secretary-redl-white-house-5g-summit>.
- ⁶ Cisco, *Enterprise Best Practices for iOS Devices and Mac Computers on Cisco Wireless LAN 4, 7* (Jan. 2018) (“As per established enterprise best practices, and both Cisco and Apple’s joint recommendation, the use of the 2.4 GHz band is not considered as best suiting the needs for business and/or mission critical enterprise apps.”), https://www.cisco.com/c/dam/en/us/td/docs/wireless/controller/technotes/8-6/Enterprise_Best_Practices_for_iOS_devices_and_Mac_computers_on_Cisco_Wireless_LAN.pdf.
- ⁷ U.S. Department of Transportation, *Automated Vehicles 3.0: Preparing for the Future of Transportation* 14 (Oct. 2018), <https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf> (Automated Vehicles 3.0).

authority to operate in the 5.9 GHz band because of its unusually specific allocation to DSRC technology.

The marketplace has rejected DSRC for several reasons. First, despite years of development, stakeholders continue to be concerned about DSRC's effectiveness. Automakers like BMW and Mercedes-Benz have explained to DOT that DSRC is not "trustworthy" when it comes to basic safety features.⁸ The comments filed in response to the National Highway Traffic Safety Administration's (NHTSA) Vehicle-to-Vehicle (V2V) NPRM—which proposed to mandate DSRC in all new light vehicles⁹—revealed significant concerns regarding DSRC communications failures or inaccuracies caused by congestion and GPS problems.¹⁰ Second, Americans "need not settle for DSRC."¹¹ Market-driven alternatives to DSRC are flourishing, even though they were not subsidized with a spectrum grant and government funds. As numerous commenters have emphasized to DOT, technologies like cellular-V2X (CV2X) can support vehicle safety in existing cellular bands.¹² It should come as no surprise, then, that numerous automakers (including the 5G Automotive Association, BMW, Fiat Chrysler, Mercedes-Benz, and Tesla), technology organizations (including Broadcom, NGMN Alliance,

⁸ Letter from Ryan Hagemann, Director of Technology Policy, The Niskanen Center, to Elaine L. Chao, Secretary, U.S. Department of Transportation, and Ajit Pai, Chairman, Federal Communications Commission, Docket No. 13-49, at 2 (filed June 12, 2017) (Niskanen Letter).

⁹ *See generally Federal Motor Vehicle Safety Standards; V2V Communications*, 82 Fed. Reg. 3854 (Jan. 12, 2017).

¹⁰ *See, e.g.*, Letter from Jill Ingrassia, Managing Director, Government Relations & Traffic Safety Advocacy, AAA, to U.S. Department of Transportation, National Highway Traffic Safety Administration, Docket No. NHTSA-2016-0126, at 2 (filed Apr. 12, 2017); Letter from David Tait, General Manager, Engineering Services, Mercedes-Benz USA, LLC, to Elaine L. Chao, Secretary, U.S. Department of Transportation, Docket No. NHTSA-2016-0126, at 2 (filed Apr. 12, 2017); Waymo Comments on NHTSA's V2V NPRM, Docket No. NHTSA-2016-0126, at 2-3 (filed Apr. 17, 2017).

¹¹ Niskanen Letter at 3.

¹² CV2X can operate in existing licensed cellular bands and is designed to have an evolutionary path to 5G (potentially enabling it to access a host of additional frequencies). Qualcomm, *Accelerating C-V2X Commercialization* 4-6, 14 (2017), <https://www.qualcomm.com/documents/path-5g-cellular-vehicle-everything-c-v2x> (direct download). Nevertheless, some CV2X proponents wish to use spectrum in the 5.9 GHz band, presumably at no cost, to support direct V2V, V2I, and V2P operations. *Id.* at 14, 19-20. This approach would require a complete rethink of the Commission's existing rules for the band, as part of which the Commission should consider the spectrum needs for this developing technology, its proposed business model for operation, and whether, given its evolutionary path to 5G, it might be more appropriate to consider it as part of the Commission's 5G spectrum efforts.

and Verizon), and policy groups opposed the proposed NHTSA mandate.¹³ Third, conversations about the future of automobile safety have shifted to autonomous vehicles, which today rely on LIDAR, cameras, sensors, and radar, potentially supplemented by V2X communications as an additional sensor input.¹⁴ As DOT has recently recognized, V2X communications systems may “enhance the benefits of automation at all levels, but should not be and realistically cannot be a precondition to the deployment of automated vehicles.”¹⁵

As a result of DSRC’s failure, no other mid-band spectrum is so underutilized or has fewer incumbent operations than the 5.9 GHz band. After nearly two decades, on any given day, it is likely that there is not a single active DSRC radio in the 5.9 GHz band in almost any U.S. ZIP code. Over the same period of time, Wi-Fi has grown so that today the average North American home has fifteen connected devices,¹⁶ many of which connect via unlicensed spectrum, and is used heavily in every community in the country. Hospitals, industrial plants, and financial centers all rely on Wi-Fi. Additionally, the unlicensed spectrum on which Wi-Fi relies has low barriers to entry and can be used without a lengthy auction or approval process—as a result, it has served as an important space for continuous wireless innovation.

The 5.9 GHz band is the right place for more Wi-Fi. Because it would facilitate a contiguous 160-megahertz channel, the 5.9 GHz band remains the best option for freeing additional unlicensed spectrum needed to support the fast-paced growth of demand for Wi-Fi, and an essential step towards enabling next-generation speeds and connectivity. But it is also the right home for Wi-Fi for other reasons.

First, because 5.9 GHz is immediately adjacent to the most-used Wi-Fi band in the country—U-NII-3—Wi-Fi network operators will be able to bring the band online almost immediately for consumers. Indeed, much of the Wi-Fi equipment deployed in the field today already could support 5.9 GHz and enable access to the band with software or firmware changes.¹⁷

¹³ See Niskanen Letter at 2-3.

¹⁴ Recognizing this, the Commission allocated additional spectrum for automotive radar use in the 77 GHz band just over a year ago. *Amendment of Parts 1, 2, 15, 90 and 95 of the Commission’s Rules to Permit Radar Services in the 76-81 GHz Band*, Report and Order, 32 FCC Rcd. 8822 (2017).

¹⁵ Automated Vehicles 3.0 at 13.

¹⁶ Merrick Kingston, *Connected device market monitor: Q2 2016*, IHS Markit (Nov. 22, 2016), <https://technology.ihs.com/585869/connected-device-market-monitor-q2-2016>.

¹⁷ See Comments of the Wi-Fi Alliance, ET Docket No. 13-49, at 3 (filed July 7, 2016) (“For example, because the U-NII-4 band is adjacent to other bands already used by unlicensed technologies like Wi-Fi, the same equipment will be able to take advantage of additional capacity and offer higher speeds using wider bandwidths — assisting in meeting the challenges of rapidly growing demand for higher-bandwidth data streams.”).

Second, because the FCC is now considering authorizing unlicensed use of the upper-adjacent 5925-7125 GHz (6 GHz) band,¹⁸ 5.9 GHz could become a critical middle-band, linking U-NII-3 with 6 GHz and creating the possibility of *several* more 160-megahertz Gigabit Wi-Fi channels (provided that incumbent operations in 6 GHz can be fully protected).

Third, the spectrum environment surrounding the 5.9 GHz band has undergone significant change since the Commission allocated the band for DSRC in 1999, supporting fresh thinking by the FCC. Because of the growth of unlicensed operations in U-NII-3 and the possibility of additional unlicensed operations at 6 GHz, if engineers were starting today with a clean slate and looking for a home for automotive operations, they would never choose the 5.9 GHz band. And DSRC's failure to launch means that the FCC is, in fact, starting with an essentially clean slate. The FCC should recognize that maintaining a speculative island of specialized automotive radios between an existing and a potential future home for unlicensed operations is bad spectrum policy and a disservice to the public interest. As Commissioner O'Rielly has said, "if DSRC no longer makes sense, the Commission could combine the 5.9 and 6 GHz bands to expand current unlicensed operations and promote continued growth."¹⁹ And as Commissioner Rosenworcel has stated, "There is no shame in correcting course. . . . [I]t's time to be ambitious and find a way forward that puts the 5.9 GHz band to fuller use."²⁰

It's time for a fresh look at 5.9 GHz. The need for more Wi-Fi spectrum, the failure of DSRC, the development of other technologies that wish to access 5.9 GHz spectrum, and changes in the adjacent-band spectrum environment all strongly support a fresh, holistic proposal for the 5.9 GHz proceeding. DOT has shifted focus from DSRC to technology-neutral standards (apparently recognizing that portions of the auto industry see greater value in alternative vehicle safety technologies) and reaffirmed its commitment to "exploring methods for sharing [the 5.9 GHz band] with other users."²¹ Because the FCC has an open proceeding on 5.9 GHz in which it has specifically raised the potential for rule changes to enable unlicensed access to the band,²² NCTA suggests that the Commission issue an FNPRM or other appropriate vehicle that:

¹⁸ *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, 32 FCC Rcd. 6373, 6381-85 ¶¶ 24-36 (2017); *Promoting Unlicensed Use of the 6 GHz Band*, Public Draft Notice of Proposed Rulemaking, ET Docket No. 18-295 (rel. Oct. 2, 2018), <https://www.fcc.gov/document/promoting-unlicensed-use-6-ghz-band>.

¹⁹ Remarks of FCC Commissioner Michael O'Rielly before the 6th Annual Americas Spectrum Management Conference, at 5 (Oct. 13, 2017), https://apps.fcc.gov/edocs_public/attachmatch/DOC-347222A1.pdf.

²⁰ Remarks of Commissioner Jessica Rosenworcel, Silicon Flatirons Conference, at 4 (Sept. 6, 2018), <https://docs.fcc.gov/public/attachments/DOC-353982A1.pdf>.

²¹ Automated Vehicles 3.0 at 16.

²² *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5GHz Band*, Notice of Proposed Rulemaking, 28 FCC Rcd. 1769, 1793-94 ¶¶ 78-81, 1798-99 ¶ 97 (2013); *The Commission Seeks to Update and Refresh the Record in the "Unlicensed National Information Infrastructure (U-NII) Devices in*

1. Recognizes that past command-and-control, over-regulatory efforts to mandate a particular technology or to reserve the band for particular companies have failed;
2. Finds that substantial changes in the 5 GHz spectrum environment, the market's rejection of DSRC, the pressing need for additional unlicensed spectrum, and the congressional mandate to identify new unlicensed resources all support a proposal to designate all or a substantial portion of the 5.9 GHz band for unlicensed use under technical rules that will enable robust Wi-Fi deployments; and
3. Seeks comment on whether to allocate other, more suitable spectrum for automotive communications technologies.

This approach will enable the Commission to take an important next step toward faster and more ubiquitous broadband connectivity for American consumers, while ensuring that its spectrum allocation decisions keep pace with the evolving connectivity needs of multiple industries.

Respectfully submitted,

/s/ Rick Chessen
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