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DSA
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July 7, 2016

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

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

Dear Ms. Dortch:

The Dynamic Spectrum Alliance (DSA) applauds the Federal Communication Commission ("Commission" or "FCC") for opening this docket, which facilitates public discussion regarding potential sharing solutions between Unlicensed National Information Infrastructure (U-NII) devices, such as Wi-Fi, and Dedicated Short Range Communications (DSRC).[1]

Building and maintaining robust wireless connectivity—including Wi-Fi—depends on access to unlicensed radio frequency spectrum. With data consumption increasing at a compound rate of over 40% per year,[2] and around 80% of mobile data traffic going over Wi-Fi,[3] DSA believes it is vital that the Commission advance policies that will that will lead to the most intensive spectrum sharing.

Opening up additional 5.9 GHz spectrum in the US is especially important because this spectrum is immediately adjacent to spectrum already allocated for U-NII use, and would effectively be an extension of those bands, allowing for additional 20, 40, 80, and even 160 MHz Wi-Fi channels. Since DSRC is based on and similar to other 802.11 standards, DSA believes that all of these devices will be able to effectively share the 5.9 GHz band.

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[1] The Dynamic Spectrum Alliance (DSA) 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* Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2015–2020 White Paper, February 3, 2016; and Ericsson Mobility Report, November 2015.

[3] June 21, 2016 comments from AT&T's president of Technology Operations, Bill Smith, at the Wells Fargo 2016 Convergence and Connectivity Symposium

DSA believes that the re-channelization proposal (moving the safety channels to the 5895-5925 MHz) will lead to the most optimal outcome for sharing in the DSRC bands.

Re-channelization not only appears to allow for more intensive sharing in the U-NII-4 band compared to Detect and Vacate Proposal,[4] but it will also move the more interference sensitive DSRC traffic away from the popular U-NII-3 band.[5]

[Close]

Sincerely,

H. Nwana
Executive Director
Dynamic Spectrum Alliance

[4] *See* Appendix A for the DSA Position Paper on Spectrum Sharing in the 5.9 GHz Band

[5] *See* DSA Opposition to Petition Reconsideration of Association of Global Automakers, Inc., and Alliance of Automobile Manufacturers, ET Docket No. 13-49 (filed June 23, 2016).

Appendix A

Spectrum Sharing in the 5.9 GHz Band:
A Dynamic Spectrum Alliance (DSA) Position Paper

Building and maintaining robust wireless connectivity—including Wi-Fi—depends on access to unlicensed radio frequency spectrum. With an exponential increase in Wi-Fi usage, including the growing Internet-of-things ecosystem, today's unlicensed bands are increasingly crowded. By 2020, Cisco projects, there will be over 50 *billion* connected devices in circulation around the world.

Carrier networks cannot economically reach all of these users and uses. Ensuring that new devices, technologies and uses can flourish therefore will require increased access to unlicensed spectrum, and the 5.9 GHz band represents a critical opportunity to expand unlicensed capacity. These frequencies, which in the United States are between 5850 and 5925 MHz, are adjacent to an existing unlicensed designation at 5725-5850 MHz. That allows extension of existing Wi-Fi standards to make use of the 5.9 GHz band, which provides two principal advantages. First, because the standards are already established and devices are already available for an immediately adjacent band, manufacturers will be able to rapidly deploy devices that take advantage of this new spectrum. Second, devices built to the 802.11ac standard can make use of channels as wide as 160 MHz. Allowing access to the 5.9 GHz band would add one 160-MHz channel to existing Wi-Fi bands. A third 160 MHz 802.11ac channel could be created if at least 40 MHz of the 5850-5925 MHz band were shared with unlicensed devices, yielding a 50% increase in ultrawide channel capacity. The availability of new, ultrawide channels will support the deployment of Gigabit Wi-Fi nationwide, and this, in turn, will foster innovative applications and services that make use of higher bandwidth wireless connectivity, creating a virtuous cycle of innovation and investment. Sharing would also result in valuable additional capacity in 20, 40 and 80 MHz channels for Wi-Fi devices.

These unlicensed devices can share effectively with other potential users of the 5.9 GHz band. The band is currently set aside for use by the automotive industry for Intelligent Transportation Systems (ITS). ITS includes dedicated short-range communications (DSRC) as well future signaling systems that would allow cars to communicate between themselves (V2V) or with smart infrastructure (V2I) in order to predict and avert collisions. Other ITS systems may not have a safety component: for example, they may facilitate turn-by-turn directions, traffic congestion and weather alerts, or wireless payments at gas stations, toll booths, or parking garages. The technology standard used by many of these applications, IEEE 802.11p, is based on and similar to other 802.11 standards, which power Wi-Fi devices.

Wireless technology companies have been exploring various coexistence frameworks to enable ITS and general-purpose communications devices to share the 5.9 GHz band. Cisco, along with the automotive industry, is exploring a "Detect and Avoid" technique. This proposal would require Wi-Fi to vacate the 75 MHz of spectrum, *along with the top 25 MHz of the U-NII-3 band*, for one second if a DSRC transmission is detected on one of five 10-MHz channels in the lower part of the 5.9 GHz band—regardless of spectral proximity or whether the transmission relates to a critical safety application. Qualcomm has proposed a re-channelization plan, in which safety-of-life ITS applications would enjoy exclusive use of the

top 30 MHz of the 5.9 GHz band. Non-safety-of-life ITS applications would be provided in the lower 45 MHz of the band (5850-5895 MHz), which would be shared with unlicensed devices operating on a secondary and non-interfering basis. Of the two, the Qualcomm re-channelization plan is likely to lead to more intensive sharing and to improved long-term availability for general-purpose uses. Broadcom Limited, a DSA member, has proposed one way of implementing sharing in the lower part of the band (i.e., between 5850 and 5895 MHz): Broadcom's proposal would have unlicensed devices defer to DSRC transmissions on a channel-by-channel basis but would not require unlicensed devices to vacate the band. DSA understands that Qualcomm may propose its own approach for sharing in the lower part of the band, which will also prioritize DSRC transmissions but allow continued unlicensed operation. All approaches to sharing in the lower part of the band should be considered to determine which approach enables maximum spectrum utilization.

Consistent with a European Conference of Postal and Telecommunications Administration's finding that critical road safety applications require 20 MHz of spectrum, the Qualcomm re-channelization approach reserves ample bandwidth for those communications, while providing for unlicensed operations alongside non-critical ITS applications that are more tolerant of possible packet delay. Therefore, whether combined with Broadcom's proposal or with another proposal for sharing in the lower part of the band, Qualcomm's re-channelization proposal would protect safety of life channels, and provide DSRC priority in the shared channels below 5895 GHz. Neither the Qualcomm nor the Broadcom approach would require unnecessarily vacating the entire band. By contrast, if DSRC technology is widely deployed, Cisco's detect-and-avoid approach could foreclose meaningful unlicensed operation in many parts of the country, including the top 25 MHz of the U-NII-3 band, even when portions of the spectrum could be used without causing harmful interference to automotive applications.

The Federal Communications Commission (FCC), working together with the Department of Transportation (DOT) and the Department of Commerce, should take action now to free up additional spectrum for Wi-Fi and other unlicensed communications. As noted above, the first generation of unlicensed devices supporting 5.9 GHz communications could be developed very rapidly. By taking action now, well before ITS and DSRC are deployed, impacts on ITS and DSRC deployments would also be avoided. By contrast, the National Highway Traffic Safety Administration, which tentatively plans to mandate DSRC systems in all new models beginning in 2020, estimates that it will be years before vehicle-to-vehicle technology is widely deployed. It makes little sense to allow the valuable 5.9 GHz spectrum to remain largely unused during that time.

The FCC, DOT, and Commerce recently issued a letter promising to start joint testing of the Cisco and Qualcomm proposals, as well as prototype devices that would operate in the 5.9 band. This is an important first step. But testing should be followed quickly by rules that authorize unlicensed use of the band while protecting safety-of-life applications in automobiles, to deliver both important safety benefits for drivers and expanded broadband capacity for all Americans.