

**Attachment—Additional Questions for the Record**

**Subcommittee on Communications and Technology  
Hearing on  
“Our Wireless Future: Building A Comprehensive Approach to Spectrum Policy”  
July 16, 2019**

Mr. Julius P. Knapp, Chief, Office of Engineering and Technology, Federal Communications  
Commission

**The Honorable Jerry McNerney (D-CA) & the Honorable Robert E. Latta (R-OH)**

- 1. As Co-Chairs of the Congressional Wi-Fi Caucus, we are interested in ensuring that the FCC leverages the current opportunity afforded by the 6 GHz NPRM to dedicate significant contiguous spectrum to unlicensed use. Considering the consumer benefits that continue to flow from unlicensed Wi-Fi technology, we are concerned that even more spectrum is needed. With this consideration in mind, please answer the following questions:**
  - a. In 2003, the FCC made a meaningful addition to 5 GHz spectrum access by allowing Wi-Fi use of the 5.47-5.75 GHz band subject to certain conditions. Please detail what other spectrum bands have been made available since 2003 for unlicensed Wi-Fi use.**

**Response:** The Commission has taken a number of actions since 2003 to make additional spectrum for unlicensed use. Importantly, the Commission does not generally identify spectrum for any particular technology. It is up to industry to decide whether to develop standards for Wi-Fi in any particular spectrum band that is available for unlicensed use.

In 2012 the Commission made spectrum available for unlicensed devices operating the white spaces in the TV broadcast bands. These rules were updated earlier this year and we anticipate the Commission will soon propose further steps to improve these rules, particularly for use in rural areas and for the Internet of Things. Thus far industry has not developed standards for Wi-Fi in this spectrum.

In 2014 the Commission removed the indoor use restriction on unlicensed use of the 5150 – 5250 MHz band and increased the power. As a result, this band has become much more heavily used for Wi-Fi.

In 2016, the Commission adopted rules creating a 14 GHz wide block of spectrum for unlicensed use at 57 – 71 GHz. The Wi-Fi standard now covers this band.

In 2018 the Commission finalized its rules for the Citizen's Broadband Radio Service in the 3550 – 3700 MHz band that combined elements of our rules for licensed and unlicensed use. Thus far no Wi-Fi standard has been developed for this band.

Earlier this year the Commission adopted rules to provide 21.2 GHz of spectrum for unlicensed use in several bands above 95 GHz, specifically, the 116 – 123 GHz, 174.8 – 182 GHz, 185 – 190 GHz and 244 – 246 GHz bands. While we are unaware of any activity to develop a Wi-Fi standard for this spectrum, keep in mind that the original Wi-Fi standard was not developed until a dozen years after the spectrum was first made available. Late last year the Commission proposed to make an additional 1.2 GHz of unlicensed spectrum in the 6 GHz band (5.925-7.125 GHz). This spectrum would double the amount of Wi-Fi spectrum currently available in the mid-band. This spectrum is used for point-to-point microwave services that support utilities, public safety and commercial wireless backhaul, as well as several other services. These communities have expressed strong concerns about potential interference. The technical issues are quite complex, but I can assure you that our engineering staff is working hard to develop a path forward.

- b. In addition to the 6 GHz band, is the FCC considering any other bands for potential unlicensed Wi-Fi use? If so, please note which bands and the status of the review for each of these bands.**

**Response:** Unlicensed devices share spectrum with incumbent services on a non-interference basis. As reflected in our current proceedings at 5.9 GHz and 6 GHz, this requires development of techniques to ensure that harmful interference will not occur. Several other elements factor into whether a particular frequency band is suitable for Wi-Fi, including the technical characteristics of the spectrum itself, available bandwidth, viability of the sharing techniques, impact of any constraints, proximity to existing bands used for Wi-Fi that may affect equipment designs and costs, etc. Industry is in the best position to evaluate these considerations and thus far has not identified any other spectrum bands that are suitable for Wi-Fi. Nevertheless, we will continue to consider such opportunities as the Commission has done throughout its past.

**Attachment—Additional Questions for the Record**

Mr. Julius P. Knapp, Chief, Office of Engineering and Technology, Federal Communications Commission

**The Honorable Tom O’Halleran (D-AZ)**

1. **Mr. Knapp, in the GAO’s recent report [*“FCC Should Undertake Efforts to Better Promote Tribal Access to Spectrum”*], they conclude that “the FCC’s efforts to promote and support tribal entities’ access to spectrum have done little to increase tribal use of spectrum, as only very few tribes are accessing spectrum to be able to provide internet service.”**
  - a. **What further actions are needed by the Commission or Congress to better enable tribes to access valuable spectrum resources?**

**Response:** Tribal Nations face unique and significant obstacles to offering service in rural Tribal areas, even when compared to rural non-Tribal lands. The Commission recognizes the need to work in close collaboration with Tribal Nations as well as non-Tribal stakeholders. Making mid-band spectrum available for advanced wireless services, including 5G, provides a critical opportunity to address the need for wireless broadband in rural and Tribal areas. Mid-band spectrum offers a desirable combination of coverage and capacity for wireless services. Under Chairman Pai’s leadership, the Commission has sought not only to make mid-band spectrum available for 5G generally, but also to identify specific opportunities for rural Tribal Nations to obtain access to this spectrum with a special early-access priority window.

2. **Mr. Knapp, under the MOBILE NOW Act signed into law last Congress, NTIA and the FCC are directed to consider “the importance of deployment of wireless broadband services in rural areas” when identifying a total of 255 MEGAHERTZ of spectrum to become available for wireless use.**
  - a. **In making 255 MEGAHERTZ of spectrum available, what measures does the Commission (in consultation with NTIA) plan to implement to assist rural and underserved communities in gaining access to this spectrum once it becomes available?**

**Response:** The Commission is committed to ensuring that consumers in rural and underserved areas have access to the wireless broadband services. Several recent and upcoming spectrum auctions, including Auction 101 (28 GHz band), Auction 102 (24 GHz band), Auction 103 (37, 39, and 47 GHz bands), and Auction 105 (3.5 GHz band), have included bidding credits designed to encourage participation by rural service providers and small businesses. In the upcoming 3.5 GHz auction, providers that serve fewer than 250,000 subscribers in primarily rural areas will be eligible for a 15% bidding credit up to \$10 million.

In July 2019, the Commission adopted a *Report and Order* that transforms the regulatory framework governing the 2.5 GHz band with an emphasis on spurring the deployment of 5G services in rural and Tribal areas. Spectrum in the 2.5 GHz band has been underutilized in many rural areas and the reforms adopted by the Commission aim to quickly reassign that spectrum to providers that will use it to serve rural consumers. The *Report and Order* establishes a priority filing window for rural Tribal Nations to obtain unassigned 2.5 GHz spectrum licenses to improve access to wireless broadband on Tribal lands. The Wireless Telecommunications Bureau and Office of Native Affairs and Policy are conducting extensive outreach to Tribes to inform them of the priority window and support Tribes that pursue licenses. FCC staff gave presentations on the 2.5 GHz band and the upcoming priority window at the August 2019 Tribal Workshop in Billings, MT, and the September 2019 National Broadband Summit in Washington, DC, and will be conducting further workshops in the months leading up to the priority window.

The Commission also has two ongoing proceedings that will make valuable spectrum available for use in rural areas. Specifically, the Commission proposed to make some or all of the spectrum between 3700 MHz and 4200 MHz available for licensed use by repurposing satellite C-band spectrum. This mid-band spectrum is suitable for providing service in rural areas, particularly in combination with lower frequency bands. The Commission also proposed to make 1.2 GHz of spectrum available for unlicensed use in the 5925 – 7125 MHz band. As is the case with unlicensed spectrum generally, it would be available for use in rural areas. I should add that, in addition I anticipate the Commission will consider proposals to improve our rules for TV White Spaces to make them better suited for service in rural areas.

**3. Mr. Knapp, at the July FCC Commissioner’s Meeting, the FCC voted on a report and order reforming the EBS Spectrum Band. Part of this order gave a priority filing window for eligible, federally-recognized tribal governments tribal communications providers. I understand there will be a 90-day tribal outreach period followed by a 60-day application window.**

**a. Could you comment on whether this is a sufficient allocation of time- 90-days for tribal outreach and 60-day application windows, respectively- for tribes in advance of this spectrum auction? Were longer outreach and application windows considered?**

**Response:** The 2.5 GHz band Tribal priority window will put prime mid-band spectrum into the hands of Tribal Nations and entities to enable broadband deployment to rural Tribal areas. In the 2.5 GHz NPRM we sought comment on tribal priority window application procedures, including the length of time for outreach and for the application window. Several (6) Tribal entities proposed a 90-day notice period and 60-day filing period. The Order directs the FCC’s Wireless Telecommunications Bureau to announce procedures through a public notice, consistent with our process for bidding procedures.