

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Unlicensed Use of the 6 GHz Band)	ET Docket No. 18-295
)	
Expanding Flexible Use in Mid-Band Spectrum)	GN Docket No. 17-183
Between 3.7 and 24 GHz)	

**COMMENTS OF THE
SCHOOLS, HEALTH & LIBRARIES BROADBAND (SHLB) COALITION**

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The Schools, Health & Libraries Broadband (SHLB) Coalition hereby submits these reply comments in response to the Notice of Proposed Rulemaking in the above-captioned proceedings (“*NPRM*”).¹ The SHLB Coalition supports the Commission’s proposal to authorize unlicensed sharing across the entire 1,200 megahertz from 5925 to 7125 MHz with the understanding that existing public safety and other users of this band will be protected from interference.

The SHLB Coalition is a broad-based coalition of organizations that share the goal of promoting open, affordable, high-quality broadband for anchor institutions and their communities.² High-capacity broadband is the key infrastructure that health care providers (HCPs), libraries, K-12 schools, community colleges, colleges and universities, public media, and other anchor institutions need for the 21st century. Enhancing the broadband capabilities of these community anchor institutions is especially important to the most vulnerable segments of our population—those in rural areas, low-income consumers, disabled and elderly persons, students, minorities, and many other disadvantaged members of our society.

Several parties in this proceeding have pointed out that facilitating affordable wireless connectivity for all Americans is a national priority, and that gigabit-fast Wi-Fi can operate well in the 6 GHz band of spectrum. Making 1200 MHz of unlicensed spectrum available for shared,

¹ *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Proposed Rulemaking, ET Docket No. 18-295 and GN Docket No. 17-183, FCC 18-147 (rel. Oct. 24, 2018). The *NPRM* was published in the Federal Register on December 17, 2018. See 83 Fed. Reg. 64506 (Dec. 17, 2018).

² SHLB Coalition members include representatives of health care providers and networks, schools, libraries, state broadband offices, private sector companies, state and national research and education networks, and consumer organizations. See <http://shlb.org/about/coalition-members> for a current list of current SHLB Coalition members.

unlicensed use is extremely important for anchor institutions (schools, libraries, health care providers and other community institutions), especially in rural and underserved communities. For instance, Qualcomm states that “[u]nlicensed operations in the proposed 6 GHz band would enable multiple wideband channels and ultra-high-speed connections in homes, businesses, schools, universities, and libraries across America.”³

The shortage of WiFi purposes is well-documented. According to an article in IEEE Spectrum magazine:

. . . Wi-Fi connections are steadily getting worse. The reason would appear to be obvious: There are many more people—and things—using Wi-Fi than a decade ago, and the numbers continue to grow. Today, [6.4 billion](#) connected devices are in use around the globe. By 2020, that will mushroom to 20.8 billion—that’s [2.8 mobile devices](#) for every person on Earth. So certainly the wireless highways through which Wi-Fi traffic moves have gotten and will continue to get more crowded.⁴

The IEEE article goes on to say that congestion in the 2.4 GHz band is so bad that “it has pretty much made the 2.4-GHz band unusable for transferring data at high rates.” The article also notes that over half the 5 GHz channels in the U.S. are allocated for primary use by weather and military radar, with the result that “[i]nserting Wi-Fi into this radar-priority spectrum requires special technology, so to date most consumer routers ignore these lanes.”

Another article in NetworkWorld says that shifting to a different channel is not an easy solution to WiFi congestion:

Within the 2.4GHz frequency, the most widely used Wi-Fi band, there are only three non-interfering channels. Even within the 5GHz band, only four non-overlapping 40MHz wide channels exist after eliminating Dynamic Frequency Selection (DFS), a mechanism to allow unlicensed devices to share spectrum with existing radar systems.⁵

³ Qualcomm comments, p. 5.

⁴ <https://spectrum.ieee.org/telecom/wireless/why-wifi-stinksand-how-to-fix-it>.

⁵ <https://www.networkworld.com/article/2215287/coping-with-wi-fi-s-biggest-problem--interference.html>.

There is little alternative but to make more spectrum available for WiFi. Fortunately, the Commission has identified prime spectrum in the 6 GHz band that will go a long way toward making more unlicensed spectrum available for WiFi.

The SHLB Coalition appreciates that commenters such as the Public Interest Organizations have proposed ways to bring the benefits of Wi-Fi to schools and other anchor institutions, homes and small businesses while protecting the existing users. For instance, the Dynamic Spectrum Alliance says:

Recent studies have concluded 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 6 GHz band is an ideal location in which to expand unlicensed use: the band's "virtually identical propagation properties" to the core 5 GHz bands and its "proximity" to those bands will help ensure that consumers and businesses can take advantage of this new spectrum in a quick and cost-effective manner.⁶[footnotes omitted]

The Friday Institute notes that WiFi devices are generally deployed in every single classroom in schools across North Carolina, but the congestion in WiFi spectrum hinders its ability to facilitate personalized learning:

Many schools have been found to use 20 MHz channels, even in the 5 GHz band, in order to maximize the number of non-overlapping channels. This effectively limits the data rate provided to each student, possibly preventing individualized learning which often utilizes video-rich lectures and content.

The Friday Institute found that congestion of WiFi spectrum was even worse in colleges and universities:

In higher education, classrooms are often much larger, with many more students. Content is also not typically filtered in higher education, so bandwidth demands can be greater. Additionally, the likelihood of video-based lectures being delivered in higher education is increased as compared to K-12. Dormitories also present a unique challenge in higher

⁶ Dynamic Spectrum Alliance comments, p. 5.

education, with large numbers of clients accessing Wi-Fi in relatively small physical spaces.⁷

Beyond these three commenters, however, there is not enough recognition in the initial comments of the need for schools, libraries and other anchor institutions to have additional WiFi spectrum available. The SHLB Coalition believes the Commission should take an extensive look at the comments in the E-rate docket concerning the use of funding for Category 2 (Internal connections). In particular, the Wireline Competition Bureau Staff Report on E-rate Category 2 found significant use of E-rate funding for WiFi equipment and services and recommended that the Commission continue the budget approach so that schools and libraries could continue to upgrade their WiFi service:

The Commission established five-year category two budgets to make funding for internal connections more equitable, predictable, and more broadly available. It did so in recognition of the importance of internal connections, particularly robust Wi-Fi networks, the role they play in enhancing educational opportunities for students and library patrons, and the potential for these networks to close the digital divide. The Bureau's review of the data from the first five-year category two budget cycle shows that the Commission's goals in creating these budgets have largely been met.⁸

At the same time, the Commission must make sure that existing users of the 6 GHz band receive adequate protection against interference. For instance, GCI notes that

GCI's 6 GHz sites play a significant role in providing telehealth and distance learning services to rural Alaskans – through GCI's TERRA Network. GCI's TERRA network is an innovative effort to bring modern broadband services to some of the most rural communities in the United States. Inaugurated in 2012, the TERRA network now connects more than 84 communities in western Alaska. TERRA is often the only terrestrial, low latency, broadband service available in these remote communities.

⁷ Friday Institute for Educational Innovation at North Carolina State University (Friday Institute) comments, p. 3.

⁸ Wireline Competition Bureau Staff Report on E-rate Category 2, Modernizing the E-rate Program for Schools and Libraries, WC Docket no. 13-184, released Feb. 11, 2019, paragraphs 45-46, available at <https://www.fcc.gov/general/e-rate-schools-libraries-usf-program>.

terrestrial service that supports not only consumer Internet service in rural communities, but also supports bandwidth-hungry, latency-sensitive services like interactive distance learning and telemedicine. [footnotes omitted]⁹

The SHLB Coalition supports those commenters that find that the interference concerns can be addressed while still allowing unlicensed sharing of the 6 GHz band. For instance, we note that the Friday Institute supports making more 6 GHz spectrum available but also supports protection for existing public safety users:

we favor rules that err on the side of caution. We suggest the FCC clearly articulate the enforcement policies and penalties that could be assessed on consumers using unlicensed 6 GHz devices outdoors, or contrary to other rules dealing with this band.¹⁰

The Friday Institute comments notably distinguish between indoor and outdoor use. While there may be some legitimate concerns about interference protections for outdoor use, these concerns do not appear to be relevant to indoor use. The SHLB Coalition supports the Commission's proposal to authorize low-power, indoor-only operations across all the U-NII band segments without requiring advance coordination. There is little need to check a database for interference if the signal remains indoors. Requiring anchor institutions to engage in frequency coordination as a condition of using the spectrum indoors could be a disincentive to deploy equipment that could make the maximum use of this new technology to support digital learning and health care. Thus, we join other parties, such as the Public Interest Organizations,

⁹ Comments of GCI, pp. 1-2.

¹⁰ Friday Institute comments, p. 5.

who recommend that the Commission follow through on its proposal to allow indoor use without Automated Frequency Coordination.

Respectfully submitted,

A handwritten signature in black ink that reads "John Windhausen, Jr." with a stylized flourish at the end.

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