

**Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
Washington, D.C. 20230**

Developing a Sustainable Spectrum Strategy
for America's Future

Docket No. 181130999-8999-01
RIN 0660-XC044

**COMMENTS OF
NCTA—THE INTERNET & TELEVISION ASSOCIATION**

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January 22, 2019

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INTRODUCTION

NCTA—The Internet & Television Association (NCTA)¹ submits these comments in response to the National Telecommunications and Information Administration's (NTIA) Request for Comments regarding the development of a National Spectrum Strategy.²

NCTA agrees that the goals of identifying spectrum in both the licensed and unlicensed bands are important. In crafting a National Spectrum Strategy, however, NTIA must acknowledge certain marketplace realities. Specifically, because the primary way American consumers and businesses access and deliver critical broadband services is through Wi-Fi in

¹ NCTA is the principal trade association of the cable television industry in the United States, which is a leading provider of residential broadband service to U.S. households. Its members include owners and operators of cable television systems serving nearly 80 percent of the Nation's cable television customers, as well as more than 200 cable program networks. Cable service providers have invested more than \$290 billion over the last two decades to deploy and continually upgrade networks and other infrastructure—including building some of the Nation's largest Wi-Fi networks.

² *Developing a Sustainable Spectrum Strategy for America's Future*, Notice and Request for Comments, 83 Fed. Reg. 65,640 (Dec. 21, 2018) (Request for Comments or Request); see *Developing a Sustainable Spectrum Strategy for America's Future*, Memorandum for the Heads of the Executive Departments and Agencies, 83 Fed. Reg. 54,513 (Oct. 25, 2018) (Presidential Memorandum).

unlicensed spectrum bands, the National Spectrum Strategy should recognize the importance of Wi-Fi to Americans and the U.S. economy and include steps to promote additional spectrum for unlicensed use. NTIA should also recognize that both fixed and mobile technologies are part of a balanced spectrum policy.³ In addition, in identifying additional spectrum for licensed or unlicensed use, NTIA must recognize that hundreds of millions of Americans rely on existing non-federal licensed spectrum for current services, including C-Band satellite spectrum used to deliver television service to more than 100 million cable households across the country.

NTIA can account for these economic and marketplace realities by adopting a simple framework to guide spectrum policy. It should be the policy of the United States to: (1) put unused spectrum to work; (2) increase efficiency and intensity of use of underutilized spectrum; and (3) create careful solutions to enable additional uses, while protecting consumers' use of existing services in bands where there are intensive incumbent operations. This framework will lead to different solutions in different bands, as discussed in greater detail below.

In particular, using this framework, NCTA recommends that NTIA:

- (1) Implement the Presidential Memorandum's call for a balanced spectrum policy by making increased supply of both licensed and unlicensed spectrum core to the National Spectrum Strategy, and by including discussion of the enormous benefits to the economy of addressing the growing need for additional unlicensed bands;
- (2) Recognize the importance of unlicensed spectrum to achieving the Presidential Memorandum's core goals of (a) improving the efficient and effective use of spectrum, (b) connecting rural communities and other underserved Americans, (c) maintaining U.S. economic leadership, and (d) ensuring safety and security for Americans;
- (3) Recommend that the Federal Communications Commission (FCC or Commission) open the critical 5.9 GHz band to unlicensed operations, thereby preventing impending service degradation as demand for unlicensed spectrum outstrips existing capacity, and bringing next-generation Wi-Fi services to Americans; and

³ For instance, fixed wireless technology utilizing both licensed and unlicensed spectrum is sometimes needed to reach the most unserved rural or remote communities.

- (4) Recognize the importance of existing non-federal services that rely on spectrum and recommend a balanced approach to the examination of 3.7 GHz and 6 GHz mid-band spectrum.

I. THE NATIONAL SPECTRUM STRATEGY SHOULD IMPLEMENT THE PRESIDENTIAL MEMORANDUM’S CALL FOR A BALANCED SPECTRUM POLICY.

The Presidential Memorandum calls for a “balanced” approach to spectrum management.⁴ To achieve the Memorandum’s goals, it is necessary to increase the supply of both licensed and unlicensed spectrum. This is an important validation of work by NTIA and the FCC to identify both licensed and unlicensed spectrum resources for the country. A National Spectrum Strategy that fails to identify both licensed and unlicensed spectrum would undermine economic growth and innovation, and would lead to service degradation for consumers and businesses. To advance a balanced spectrum policy, the National Spectrum Strategy should include discussion of three important findings.

First, Wi-Fi is essential to Americans’ ability to connect and their broadband experience—and its importance continues to grow. Cisco’s Visual Networking Index projects that Wi-Fi will account for an enormous 49 percent of total Internet Protocol traffic in the United States by 2022, the largest by far of any wireless technology, and an increase from 38 percent in 2017.⁵ Looking more narrowly at Internet traffic in particular, Cisco projects that Wi-Fi will account for 56.6 percent of traffic in the United States by 2022, up from 50.4 percent in 2017.⁶

⁴ Presidential Memorandum, 83 Fed. Reg. at 54,513.

⁵ Cisco Systems Inc., *Cisco Visual Networking Index, VNI Global Fixed and Mobile Internet Traffic Forecasts, 2017-2022, VNI Forecast Highlights Tool*, https://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html (last visited Jan. 22, 2019).

⁶ *Id.*

Other estimates predict that “total Wi-Fi traffic” in the United States will double by 2020.⁷

These statistics reflect what is evident from daily experience: At home, at work, in hospitals, in universities, on military bases, and across communities, Wi-Fi is the single most important technology through which Americans access broadband and connected services. Wi-Fi supports critical services central to everyday life, from healthcare monitoring and connected medical devices, to home security, connected education, in-car navigation and entertainment, to billions of dollars in secure financial transactions. Wi-Fi access is also increasingly central to the mobile Internet—to that end, and as the FCC has recognized, “many cable companies and wireless carriers have established networks of Wi-Fi hotspots that give their customers access to high-speed data connections when away from home.”⁸

Second, Wi-Fi’s contribution to the U.S. economy is enormous—and growing. Recent research estimates that Wi-Fi and other unlicensed technologies contribute at least \$496 billion in economic surplus and \$29 billion to gross domestic product today.⁹ Wi-Fi’s total economic contribution is expected to reach over \$834 billion by 2020.¹⁰ Future economic gains could be even more dramatic, as “the beauty of unlicensed spectrum is that no one can predict what American innovators and creative geniuses will think up next” given the level playing field and low barriers to entry.¹¹

⁷ Raul Katz, Telecom Advisory Services LLC, *A 2017 Assessment of the Current & Future Economic Value of Unlicensed Spectrum in the United States* 75 (Apr. 2018).

⁸ *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, GN Docket No. 17-183, ¶ 5 (rel. Oct. 24, 2018) (6 GHz NPRM).

⁹ Katz, *supra* note 7, at 1.

¹⁰ *Id.*

¹¹ Statement of Commissioner Michael O’Rielly, 6 GHz NPRM at 50.

Third, the growth and economic benefits Wi-Fi delivers for the country depend on access to additional unlicensed spectrum because existing bands cannot keep up with demand. Absent action, residential broadband and business and industrial applications will suffer increasing service degradation in the coming years, as both the FCC and Congress have recognized.¹² A 2016 Qualcomm study concluded that “regulators should plan for around 1280 MHz of unlicensed spectrum centered around the 5 GHz band for use by unlicensed technologies,”¹³ while a 2017 study by Quotient Associates for the Wi-Fi Alliance similarly concluded that between 788 megahertz and 1.6 gigahertz of new mid-band spectrum will be needed by 2025 to satisfy demand just for Wi-Fi.¹⁴ Additionally, the RAND Corporation last November released an economic study finding that opening the 5.9 GHz band for Wi-Fi could contribute up to \$100 billion per year to the U.S. gross domestic product, and provide up to \$190 billion in economic surplus.¹⁵ The demands on unlicensed spectrum will only grow as 5G technologies and more Internet-of-Things networks are deployed, given the central role unlicensed spectrum plays in these technologies. NCTA strongly supports identifying additional licensed spectrum as well, but the Presidential Memorandum’s insistence on a balanced spectrum policy correctly reflects that a focus only on either licensed or unlicensed spectrum would have negative consequences for the country.

¹² *E.g.*, 6 GHz NPRM at 2-3, ¶ 18; 47 U.S.C. § 1502(a)(2)(A).

¹³ Rolf de Vegt et al., Qualcomm Techs., Inc., *A Quantification of 5 GHz Unlicensed Band Spectrum Needs* 5 (2016).

¹⁴ Steve Methley & William Webb, Quotient Assocs. Ltd., *Wi-Fi Spectrum Needs Study* 26, 28 (2017).

¹⁵ *See* Diana Gehlhaus Carew et al., RAND Corporation, *The Potential Economic Value of Unlicensed Spectrum in the 5.9 GHz Frequency Band* ix-x (2018), available at https://www.rand.org/pubs/research_reports/RR2720.html.

II. THE NATIONAL SPECTRUM STRATEGY SHOULD FIND THAT SUPPORTING WI-FI IS CRITICAL TO ACHIEVING THE POLICY OBJECTIVES IN THE PRESIDENTIAL MEMORANDUM.

The Presidential Memorandum identifies at least four policy objectives that the National Spectrum Strategy must advance: (1) “efficien[t] and effectiv[e]” use of spectrum; (2) increased access in “rural, unserved, and underserved parts of America”; (3) U.S. economic leadership; and (4) “security and safety” for the American people.¹⁶ Wi-Fi and other unlicensed technologies are key to achieving each of these objectives.

A. Wi-Fi advances the efficient and effective use of spectrum.

The Presidential Memorandum reflects a clear policy “to use radiofrequency spectrum . . . as efficiently and effectively as possible.”¹⁷ Efficient use of limited spectrum is critical as technological advances “increas[e] demands on” America’s limited spectrum resources.¹⁸

Unlicensed technologies, led by Wi-Fi, utilize spectrum incredibly efficiently. No other set of technologies delivers more data, operating on a wider array of devices, users, and applications, than those in the unlicensed bands. Huge numbers of users can employ unlicensed spectrum, for nearly any purpose they choose—all based on a simple set of rules. Unlicensed spectrum enables all of this to occur with less government intervention and regulation than any other band. Instead of the prescriptive rules associated with licensed services, Wi-Fi and other unlicensed technologies rely on “politeness” standards established by private standards groups to avoid interference and ensure that the spectrum carries the traffic efficiently and reliably.

¹⁶ Presidential Memorandum, 83 Fed. Reg. at 54,513.

¹⁷ *Id.*; see also Request for Comments, 83 Fed. Reg. at 65,640.

¹⁸ Presidential Memorandum, 83 Fed. Reg. at 54,513.

Unlicensed spectrum also advances efficiency by permitting use of bands that licensed technologies could not use because of the presence of incumbent operations. Wi-Fi has sharing built into its DNA, and has shown for decades that it can make use of shared spectrum while protecting incumbent users (including government users) from harmful interference on a co-channel and adjacent-channel basis in many bands. Unlicensed spectrum thereby allows the use of bands where spectrum may be underutilized, or permits complementary, non-interfering uses to develop and thrive. The result is more uses and more broadband connections in a band, serving more Americans.

Finally, unlicensed spectrum's low barriers to entry promote efficiency by supporting the development of innovative new technologies and applications that otherwise would not have access to spectrum resources. An entrepreneur with a new idea can access unlicensed bands quickly and without having to seek the permission of the government. Low barriers and minimal regulatory intervention mean the market—rather than industrial policy—can select and elevate the most valuable uses, fueling the innovation and job creation that America needs.

B. Unlicensed bands connect rural communities and other unserved and underserved parts of America.

The Presidential Memorandum also correctly identifies the economic and social imperative to connect “rural communities” and other “unserved” and “underserved parts of America.”¹⁹ Unlicensed spectrum is vital to this effort.

In many communities, low population densities cannot support the massive investments needed for the deployment of licensed commercial mobile radio services networks or fiber. Wi-Fi and other unlicensed technologies fill the gap, providing connectivity to areas of the

¹⁹ *Id.*

country where 4G and LTE wireless services (let alone the prospect of 5G wireless services) remain elusive or unreliable. Fixed wireless Internet service providers, known as WISPs, for example, offer broadband Internet access in rural areas using point-to-point and multipoint unlicensed networks.

Low regulatory barriers and flexibility in using unlicensed spectrum facilitate the development of local solutions to respond to local broadband needs. Obstacles to broadband connectivity are not the same in rural Kansas and Virginia, and unlicensed spectrum gives local businesses and entrepreneurs the spectrum resources to address community needs, without the high sunk costs and more intense regulatory environment of licensed spectrum.

C. Supporting Wi-Fi advances U.S. economic leadership.

The Presidential Memorandum also identifies “enabl[ing] economic activity” as a critical policy goal.²⁰ Unlicensed spectrum supports this objective as well. Unlike many sectors, Wi-Fi is largely an American industry. Cisco, Qualcomm, Arris, Broadcom, Netgear, Ruckus, and Juniper Networks are the core equipment players in the Wi-Fi market—and all are headquartered in the United States. Promoting the growth of Wi-Fi means promoting U.S. economic leadership in the global telecommunications industry.

In addition, as discussed previously, Wi-Fi is a critical component of the U.S. economy. It contributes approximately half a trillion dollars now, and likely will contribute a full trillion dollars by 2023.²¹ American businesses that want to communicate and compete globally rely on Wi-Fi, and additional unlicensed spectrum is necessary to ensure that growth continues unhindered.

²⁰ *Id.*

²¹ Raul Katz & Fernando Callorda, Telecom Advisory Services LLC, *The Economic Value of Wi-Fi: A Global View (2018 and 2023)* 6-7 (Oct. 2018).

D. Wi-Fi plays an important role in promoting safety and security.

Finally, the Presidential Memorandum identifies the importance of “ensur[ing] security and safety through modern technology.”²² Wi-Fi contributes to safety and security, both at home and with America’s service members abroad.

Wi-Fi has a proven track record during natural disasters. Its decentralized nature means that it is often available when cellular towers and other communications infrastructure go down, and nearly any phone, tablet, or laptop can access an open Wi-Fi network, regardless of the user’s cellular provider. During a natural disaster, a Wi-Fi connection can make a real difference for concerned family members, emergency workers, and others that are trying to connect. Wi-Fi deployment has supported on-the-ground efforts in response to Hurricanes Harvey,²³ Irma,²⁴ and Maria²⁵; wildfires in California²⁶; and elsewhere.

Wi-Fi also supports critical government functions. Wi-Fi-enabled technologies support communications and other strategic functions for the military. The U.S. Army, for example, has “field-tested Secure Wi-Fi technology” to “ma[ke] it possible for critical network and mission

²² Presidential Memorandum, 83 Fed. Reg. at 54,513.

²³ E.g., ABC13, *More than 53K Wi-Fi Hotspots Open Around Houston During Hurricane Harvey* (Aug. 26, 2017), <https://abc13.com/technology/comcast-opens-houston-wi-fi-hotspots-during-harvey/2344485/>.

²⁴ E.g., Jennifer Sorentrude, Atlanta Journal-Constitution, *Hurricane Irma: Comcast Opens WiFi Hot Spots to Non-Customers* (Sept. 6, 2017), <https://www.ajc.com/news/national/hurricane-irma-comcast-opens-wifi-hot-spots-non-customers/sTqd37MOqcOIsxAI9PEDfP/>.

²⁵ E.g., Jeff Baumgartner, Multichannel News, *Liberty Global Teams to Provide Free WiFi in Puerto Rico* (Nov. 6, 2017), <https://www.multichannel.com/news/liberty-global-teams-provide-free-wifi-puerto-rico-416351>.

²⁶ E.g., Jeff Baumgartner, Multichannel News, *Comcast Opens WiFi Hotspots in Northern California as Wildfires Rage* (Oct. 9, 2017), <https://www.multichannel.com/news/comcast-opens-wifi-hotspots-northern-california-wildfires-rage-415813>.

other bands are at the breaking point. It is also the ideal band for more Wi-Fi, as NCTA has described in the FCC’s ongoing proceeding to consider the future of the band.³⁰

First, the 5.9 GHz band is adjacent to the workhorse U-NII-3 band—the most-used Wi-Fi band in the country. Opening the 5.9 GHz band to Wi-Fi would extend the U-NII-3 band so that it would support the Nation’s first commercially viable 160-megahertz-wide channel, facilitating Gigabit Wi-Fi speeds using the latest Wi-Fi standards. Accordingly, opening the 5.9 GHz band to Wi-Fi would be a significant step toward ensuring that Wi-Fi performance can keep pace with new applications and rocketing demand.

Moreover, because the U-NII-3 band is adjacent to the 5.9 GHz band, Wi-Fi network operators will be able to bring new spectrum online almost immediately for consumers. Indeed, some existing Wi-Fi equipment already deployed could access the new band with simple software or firmware changes, saving years of delay and additional expense for consumers.³¹

Conversely, an extensive record at the FCC shows that hoped-for commercial Intelligent Transportation Services have not emerged in the 5.9 GHz band. These fully commercial, non-government users have had decades to make use of the band, but have not done so, and in the meantime, innovation in alternative vehicle safety technologies has flourished outside of the 5.9 GHz band. Technologies in use on the road today, and being developed for autonomous vehicles, such as lidar, radar, cameras, and sensors, use other existing commercial spectrum bands or do not use spectrum at all. As FCC Commissioner Michael O’Rielly has stated, “It is

³⁰ Letter from Rick Chessen, Chief Legal Officer, NCTA—The Internet & Television Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 13-49 (filed Oct. 16, 2018) (requesting that the Commission issue a Further Notice of Proposed Rulemaking in its 13-49 docket).

³¹ *See id.* at 5.

pure folly to believe that DSRC will ever work as envisioned, as time and technology advancements elsewhere have undermined previous use cases.”³² FCC Commissioner Jessica Rosenworcel has further asserted, “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.”³³ The optimal course of action is for the Commission to make the entire 75 megahertz in the 5.9 GHz band available for unlicensed operations.

IV. THE NATIONAL SPECTRUM STRATEGY SHOULD RECOMMEND A BALANCED APPROACH TO THE EXAMINATION OF 3.7 GHZ AND 6 GHZ MID-BAND SPECTRUM.

The National Spectrum Strategy should also recognize the importance of existing non-federal services that rely on C-Band spectrum in the 3.7 – 4.2 GHz and 6 GHz bands. The National Spectrum Strategy should balance the goal of making new licensed and unlicensed spectrum available with protecting existing users of the spectrum. While the 5.9 GHz band has been unutilized in most parts of the country for two decades, C-Band satellite spectrum has been heavily and consistently used for much longer by cable operators and programmers to deliver high-quality television service to more than 100 million cable households. A proposal under consideration by the FCC to reallocate some or all of the 3.7 – 4.2 GHz portion of the C-Band for licensed use could significantly disrupt the television content distribution ecosystem to the detriment of tens of millions of consumers.³⁴ To guard against this result, there should be a transparent, robust reallocation and transition process that is subject to direct Commission

³² Statement of Commissioner Michael O’Rielly on NCTA 5.9 GHz Letter (Oct. 16, 2018), <https://docs.fcc.gov/public/attachments/DOC-354589A1.pdf>.

³³ Remarks of Commissioner Jessica Rosenworcel, Silicon Flatirons Conference, at 4 (Sept. 6, 2018), <https://docs.fcc.gov/public/attachments/DOC-353982A1.pdf>.

³⁴ *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Notice of Proposed Rulemaking, 33 FCC Rcd. 6915 (2018).

oversight, including the ability to meaningfully enforce commitments to protect existing users against current and future disruption of services.³⁵

A balanced approach is appropriate in the 6 GHz band as well, which also supports existing C-Band satellite services, in addition to Cable Television Relay Service (CARS) and Broadcast Auxiliary Service (BAS) operations. If existing uses can be fully protected in this band, the Commission’s separate proposal to permit shared unlicensed use also presents an opportunity to make additional unlicensed spectrum available.³⁶ If the Commission authorizes unlicensed use of the adjacent 5.9 GHz band, this would create a wide swath of spectrum—*up to 1200 megahertz*—to expand current unlicensed operations.

³⁵ See Reply Comments of NCTA—The Internet & Television Association, GN Docket No. 18-122, at 22-23 (filed Dec. 11, 2018) (“In fulfilling this role, the Commission has often turned to spectrum auctions, which present numerous benefits, including robust Commission oversight, FCC-driven and enforceable incumbent protection and reimbursement methods, and a fair and transparent process for assigning scarce spectrum resources.”).

³⁶ 6 GHz NPRM.

CONCLUSION

As NTIA pursues a sensible path forward on spectrum policy, especially in preparing the National Spectrum Strategy, it should recognize the economic and social benefits of a balanced spectrum policy that identifies new licensed and unlicensed spectrum; consider the ways Wi-Fi and other unlicensed applications directly advance the core goals of the Presidential Memorandum; and recommend concrete actions to open the 5.9 GHz band to unlicensed operations and balance interests in the 3.7 GHz and 6 GHz bands.

Respectfully submitted,

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