Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Washington, D.C. 20230

In the Matter of	)	
A National Spectrum Strategy for the United States	)	Docket No. 230308-0068

COMMENTS OF THE WIRELESS INFRASTRUCTURE ASSOCIATION

The Wireless Infrastructure Association ("WIA")[1] submits these comments in response to the National Telecommunications and Information Administration's ("NTIA") Request for Comment ("RFC") in the development and implementation of a National Spectrum Strategy for the United States.[2] WIA strongly supports NTIA's efforts to develop and implement a spectrum strategy and urges NTIA to move forward with urgency. A National Spectrum Strategy that will enable American innovation and secure continued American leadership in the wireless telecommunications ecosystem must provide industry with a clear path forward on making spectrum available to encourage investment and innovation.

There are three fundamental objectives that NTIA must achieve in its spectrum strategy. First, NTIA must identify the specific bands that it will make available for commercial use and develop an aggressive timeline to do so. Second, NTIA must balance the needs of different

[1] WIA is the principal organization representing companies that build, design, own, and manage telecommunications facilities throughout the world. WIA's members include infrastructure providers, carriers, and professional services firms.

[2] NTIA, Request for Comments, Development of a National Spectrum Strategy, Docket No. 2308-0068, 88 Fed. Reg. 16244 (Mar. 16, 2023) ("*National Spectrum Strategy RFC*").

spectrum allocation models, recognizing the significant benefits of licensed, exclusive-use spectrum. Third, NTIA must recommit to a process that respects the roles of both NTIA and the Federal Communications Commission ("FCC"), while assuming the mantle of the single entity that speaks for the executive branch on spectrum policy.

I. LONG LEAD TIMES MEAN NTIA MUST MOVE EXPEDITIOUSLY IN ORDER TO BRING SPECTRUM TO MARKET

A. The Infrastructure Needs of Spectrum

Spectrum is often referred to as "invisible infrastructure" and WIA members represent the fulcrum where this invisible infrastructure meets the physical infrastructure needed to leverage it. The spectrum bands in use directly influence America's physical infrastructure needs, driving the demand for supporting towers and other cell sites, including small cells, in-building antennae, and other network equipment. Every piece of this physical infrastructure requires advanced planning—whether it is antenna development or a siting permitting process—that must begin years before the spectrum can be used. The physical nationwide infrastructure devoted to deploying America's spectrum-based networks are staggering. As of the end of 2022 there were:

- 142,100 cellular towers in operation;
- 209,500 macrocell sites, not including small cells;
- 678,700 macrocell sectors;
- 452,200 outdoor small cells nodes; and
- 747,400 indoor small cell nodes.

These decisions, preparations, and deployments resulted in $11.9 billion in cellular network construction last year.[3] The infrastructure in turn drives American jobs, with over 400,000 people

[3] IGR, *Wireless Infrastructure By the Numbers: 2022 Key Industry Statistics*, WIRELESS INFRASTRUCTURE ASSOCIATION at 2, https://wia.org/wireless-infrastructure-by-the-numbers-2022-key-statistics/ (published Q1 2023).

employed in the U.S. to build, maintain, and operate the nation's wireless and mobile networks,[4] in addition to the millions of American jobs enabled by these networks.[5] Given how much rides on each spectrum band decision, smart planning is essential.

B. NTIA Can Expedite Commercial Spectrum Availability by Building on Existing Guidance and Ensuring Clear Federal Roles

The good news is that NTIA need not start its spectrum planning from scratch. Numerous formal working groups have studied and published recommendations on many of the spectrum issues upon which the RFC seeks comment, including a recent industry report that identified 1150 MHz of suitable midband spectrum.[6] These bodies also include those under the auspices of the government—including the Department of Commerce's own Commerce Spectrum Management Advisory Committee and the FCC's Technical Advisory Committee—with WIA as a proud participant in both. Many other stakeholder convenings, including NTIA's Spectrum Policy Symposiums and third parties such as the Aspen Institute have also added to the discussion.[7] Even the Government Accountability Office ("GAO") has previously weighed in to promote interagency spectrum collaboration.[8] NTIA should evaluate and incorporate this previous work as it develops its formal strategy.

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[4] *Id*.

[5] *See, e.g.*, COMPASS LEXECON, *The Importance of Licensed Spectrum and Wireless Telecommunications to the American Economy* at 16 (Dec. 2022), https://api.ctia.org/wp-content/uploads/2022/12/Compass-Lexecon-Licensed-Spectrum-Report.pdf (demonstrating the number of individuals employed in the wireless industry); ACCENTURE, *The Impact of 5G on the United States Economy* (Feb. 2021), https://www.accenture.com/us-en/insights/high-tech/5g-economic-impact; Michael Mandel and Elliot Long, *The Third Wave: How 5G Will Drive Job Growth Over the Next Fifteen Years*, PROG. POLICY INSTITUTE (Sept. 17, 2020), https://www.progressivepolicy.org/publication/the-third-wave-how-5g-will-drive-job-growth-over-the-next-fifteen-years/.

[6] ACCENTURE, *Spectrum Allocation in the United States* at 3 (Sept. 2022), https://api.ctia.org/wp-content/uploads/2022/09/Spectrum-Allocation-in-the-United-States-2022.09.pdf.

[7] *See,* 2022 NTIA Spectrum Policy Symposium (Sept. 19, 2022), available at https://ntia.gov/other-publication/2022/2022-ntia-spectrum-policy-symposium; ASPEN, *Toward a National Spectrum Strategy* (Sept. 13, 2022), https://www.aspeninstitute.org/wp-content/uploads/2022/09/Spectrum-Report_9_13_22.pdf.

[8] GOV'T. ACCOUNTABILITY OFFICE, *Report to the Committee on Science, Space, and Technology, House of Representatives: Spectrum Management*, GAO-21-424 (June 2021), https://www.gao.gov/products/gao-21-474.

Fundamentally, NTIA should concentrate on making more spectrum available for commercial use quickly and on a continual basis across all bands. In making this spectrum available, WIA encourages the Administration to recognize the diverse needs of spectrum users and ensure adequate spectrum is allocated for all applications. This includes recognizing the significant role mobile broadband currently plays in the ecosystem, primarily over licensed spectrum. However, the identification of bands is only the first step in a multi-year process to make the spectrum commercially available. Industry cannot wait years on additional study after a band has been identified, particularly when the current federal occupants of those bands lack incentive to adjust or vacate current operations in those bands, if it plans to meet the rapid and continuing demands of consumers. NTIA must move decisively to determine which bands *will be* available, not if bands *could be* available.

In addition to ensuring adequate spectrum, WIA also supports NTIA in further examining ways to bolster the deployment of physical infrastructure to be able to utilize this spectrum. Without being able to deploy the needed infrastructure, NTIA's plans to make spectrum available will mean little. One way NTIA could seek to improve infrastructure deployment is to ensure smart and efficient policies among the federal government agencies for review of applications to modify or deploy communications equipment utilizing spectrum. Numerous agencies must review and approve applications depending on where they are deployed, including the Department of Defense and the Federal Aviation Administration. WIA supports responsible oversight to ensure the safety of all operators, but also encourages the Administration to seek ways to eliminate duplicative reviews and expedite applications.

WIA also emphasizes the need of the Federal government to speak with a clear and consistent voice on spectrum policy. The risks and obstacles of inconsistent federal guidance have

become all too real in recent years. To avoid future disruptions, it is critical that spectrum policy be developed with input from other agencies, particularly the FCC, which is charged with managing commercial spectrum. It is also critical that other federal agencies abide by FCC decisions that are made with proper NTIA input. Infighting amongst federal agencies will not help our national goals for wireless communications.

Finally, NTIA must also recognize the importance of an adequate pipeline of talent for the workforce that enables wireless telecommunications. The broadband workforce has experienced significant strains to meet the demand of growth. Professionals from RF engineers to tower climbers are needed to realize the economic and social benefits promised by making more spectrum available. NTIA should support institutions of higher education along with industry associations with training programs in attracting and training new talent along with working with industry to incentivize hands-on training in the field.

II. COMMERCIAL SPECTRUM USAGE UNDERGIRDS AMERICA'S SUCCESS AND REQUIRES A DEDICATED PIPELINE

A. Previous Spectrum Policies Have Fundamentally Benefitted American Life

The benefits of spectrum to all facets of American life are well documented.[9] A key factor in America's spectrum usage has been the balance between ensuring licensed and unlicensed spectrum availability. Undoubtedly, both models have promoted innovation and enabled services that we enjoy today—licensed wireless networks have enabled America's gold standard of on-demand mobile connectivity nationwide while low-powered operations over unlicensed spectrum has become a cornerstone for keeping billions of devices connected in our homes, workplaces, and

[9] *Toward A National Spectrum Strategy,* ASPEN at 5 ("[A]ccess to spectrum has been a primary driver of progress benefitting all Americans.").

even recreational areas. Therefore, ensuring the right mix of licensing is critical to enable tomorrow's uses.

One of the nation's great contributions to the world has been developing an auction method for distributing spectrum rights, ensuring that the spectrum will be put to its highest use and will not lay fallow.[10] Since this process has been implemented, the FCC has held over one hundred auctions for spectrum rights which raised more than $233 billion in revenues and "unlocked extraordinary benefits for the American people."[11] Accordingly, one of the first things any responsible spectrum strategy must ensure is that the FCC is fully authorized to auction commercial spectrum.

Wave after wave of American success has resulted from spectrum auctions, which have been translated into commercial spectrum use and innovation. From celebrating the first cellular voice call 50 years ago to a 2G texting world, 3G internet browsing capabilities, an entire 4G app economy, and now the current payoff of 5G, American lives have been fundamentally and profoundly changed every step of the way—wherever they are—by commercial licensed spectrum use.

Beyond mobility benefits, 5G commercial spectrum is increasingly used to connect homes, most recently shown by the surge in fixed wireless access ("FWA") to the home subscriptions. Market data demonstrates that consumers are gravitating to FWA broadband, with fixed wireless broadband service representing 90 percent of net new at-home broadband subscriptions last year.[12]

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[10] *Id.* at 15 ("As a measure of its success, the U.S. model has been imitated around the world — over 100 spectrum auctions are scheduled globally over the next few years in over 80 countries across many different spectrum bands.").

[11] Chairwoman Rosenworcel Statement on the Expiration of the FC Spectrum Auction Authority, FED. COMMC'NS. COMM'N. (Mar. 10, 2023), https://docs.fcc.gov/public/attachments/DOC-391576A1.pdf.

[12] Press Release, *About 3,500,000 Added Broadband From top Providers in 2022*, LIECHTMAN RESEARCH GROUP (Mar. 2, 2023), https://www.leichtmanresearch.com/about-3500000-added-broadband-from-top-providers-in-2022/ ("Top broadband providers added about 3.5 million subscribers in 2022. Fixed wireless services accounted for 90% of the net broadband additions in 2022, compared to 20% of the net adds in 2021.").

This growth is not unique to the U.S. either. Globally, nearly 20 percent of mobile traffic is used by FWA to the home. In the next five years, the expected monthly data usage is expected to grow nearly 30 percent, reaching over 85 exabytes (EB) per month.[13]

Additionally, FWA broadband has inherent speed and cost advantages over wireline solutions because service providers can bring internet access without laying fiber or cables to provide last mile connectivity. Where fiber deployment costs can range from $800 to $6,000 per location, FWA costs range from $200 to $1,800 per location while still providing download speeds from 25 Mbps to 1 Gbps depending upon the technology.[14]

While FWA can be deployed using both licensed and unlicensed spectrum, the recent gains in FWA subscribership have come from consumers seeking providers using licensed spectrum. Recent innovations in midband operations, particularly over 5G networks, have enabled this technology to quickly become a relevant competitor to traditional internet services offerings. The availability of more midband spectrum would further bolster the ability of carriers to deliver this transformative technology to more users.

All of this means that consumers win; more providers can enter the market, providing competitive options to the traditional duopoly of wired broadband. In some areas, this is making high-speed broadband available for the first time, helping to rapidly close America's digital divide. This is all a result of successful spectrum policy of the past that prioritized making spectrum available for commercial uses.

[13] ERICSSON MOBILITY REPORT at 38 (Nov. 2022), https://www.ericsson.com/en/reports-and-papers/mobility-report.
[14] IGR, *The Fixed Wireless Network: A Market Report*, WIRELESS INFRASTRUCTURE ASSOCIATION at 2, 12 (published Q4 2022), https://go.wia.org/wp_fixedwireless.

B. A Spectrum Pipeline Across Bands is Fundamental to Future Development

NTIA's goal of identifying 1500 MHz of spectrum "for in-depth study to determine whether that spectrum can be repurposed to allow more intensive use" [15] is a laudable goal, though WIA challenges NTIA to identify even more spectrum and provide clear timelines for making that spectrum available to the public. A successful strategy should do more than just identifying bands for study, but instead identify which specific bands will be repurposed with a clear schedule to do so. The strategy should emphasize the need for midband spectrum that meets the needs of high data throughput and wide area propagation, as well as critically evaluating all bands to determine new opportunities to make spectrum available.

Midband spectrum has been rightly praised and prioritized for its 5G potential. FCC Chairwoman Jessica Rosenworcel has observed that:

> [b]ecause it offers an ideal blend of capacity and coverage, this spectrum is key to delivering on the promise of 5G services and ensuring that it reaches as many people as possible. The bottom line is we need mid-band deployment at scale to foster invention in the new 5G spectrum frontier.[16]

In fact, this mid-band spectrum has been essential to the success of fixed wireless broadband services, as discussed above.[17]

Yet, NTIA should also consider other spectrum bands to enable development and innovation in the wireless ecosystem. Multiple efforts are underway in both the government and

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[15] *National Spectrum Strategy RFC* at 4.

[16] Kelly Hill, *Rosenworcel Says She Will Propose A New Look at Standards for Receivers as well as Transmitters*, RCRWIRELESS (Mar. 2, 2022), https://www.rcrwireless.com/20220302/spectrum/we-need-mid-band-deployment-at-scale-rosenworcel-says-2-5-ghz-auction-ahead-in-july.

[17] Mike Dano, *What the 6GHz Band Might Mean for FWA*, LIGHTREADING (Aug. 12, 2022), https://www.lightreading.com/broadband/fixed-wireless-access-(fwa)/what-6ghz-band-might-mean-for-fwa/d/d-id/779664 ("Much of the growth in FWA is due to the release of more midband spectrum for 5G. Such spectrum provides network operators with the capacity necessary to support home Internet traffic that can total 1TB or more per month.").

the private sector to improve spectral efficiency. Innovations like spectrum duplexing, improved receiver tolerance, and software defined networks have the potential to dramatically shift how and where operations can take place in various bands. In developing its Spectrum Strategy, WIA encourages NTIA to consider all bands to allow these developments to be tested and prepare for the next evolution in wireless communications.

III. THE SPECTRUM STRATEGY SHOULD CONSIDER THE DIVERSE ECOSYSTEM OF SPECTRUM USERS AND ALLOCATE SUFFICIENT RESOURCES FOR SPECIFIC USES

The growth and innovation in wireless technology of the 21st century has largely been built on the foundation of licensed spectrum.[18] New advances in spectrum sharing will alleviate some of the strain on licensed operations; however, to realize the benefits of 5G for all Americans, there needs to be sufficient spectrum available to meet consumer's demand across the country.

A. The Majority of Commercial Wireless Traffic is Mobile Broadband Which Requires Licensed Spectrum

WIA supports the Administration's efforts to make more spectrum available and encourages policymakers to continually make more spectrum available with a focus on licensed use on an exclusive or primary basis. The target of 1500 MHz across various bands is a laudable first step but more will be needed. A recent Accenture report recommended that the U.S. government make 1150 MHz of licensed spectrum alone to meet expected demand for mobile broadband.[19] In order to maintain the United States' preeminence in the wireless ecosystem we must adequately support this fundamental technology.

[18] *See* Kathy Grillo, *Licensed Spectrum Foundational to Smart Spectrum Policy*, POLITICO (Jan. 23, 2023), https://www.politico.com/sponsor-content/2023/01/23/licensed-spectrum-is-foundational-to-smart-spectrum-policy.
[19] ACCENTURE, *Spectrum Allocation in the United States* at 33 (Sept. 2022), https://api.ctia.org/wp-content/uploads/2022/09/Spectrum-Allocation-in-the-United-States-2022.09.pdf.

Consumer demand for mobile broadband has been exponentially growing over the past several years; a trend that is expected to continue. As a percentage of wireless traffic, mobile broadband dominates usage. Currently, mobile broadband constitutes 84 percent of mobile traffic. In the next five years, this is expected to rise to 93 percent of all mobile traffic.[20] Since 2015, average monthly traffic per smartphone has increased nearly threefold from 5 GB per month to nearly 15 GB per month. Ericsson currently projects that number to increase to 52 GB per month by 2027.[21] NTIA and the Federal government play a critical role in ensuring the invisible infrastructure making these developments possible is provided for.

B. Commercial Spectrum Should be Made Available Across Bands with a Focus on Midband Spectrum for 5G

The wide adoption of 4G unlocked new economic potential in the app economy. As 5G networks are powered on across the country, we must prepare for the next leap in information technology. It is expected that 5G services will add $1.5 trillion to the U.S. economy and enable over four million additional jobs.[22] To enable these advancements, it is critical that service providers are able to fully utilize their spectrum holdings. In many cases, this will require exclusive or primary use of allocations to deliver high speed and reliable service over wide geographic areas. [23]

In addition to licensed usage, WIA encourages NTIA to make these offerings available across low-, mid-, and high-bands. It is only through this blend of available spectrum that the promises of 5G will reach all Americans. While high-band operations are often a subject of focus

[20] ERICSSON MOBILITY REPORT at 5.
[21] *Id.* at 16.
[22] BOSTON CONSULTING GROUP, *5G Promises Massive Job and GDP Growth in the US* at 3 (Feb. 2021), https://api.ctia.org/wp-content/uploads/2021/01/5G-Promises-Massive-Job-and-GDP-Growth-in-the-US_Feb-2021.pdf.
[23] *See Mary Brown on Building a Spectrum Pipeline*, HIGH TECH FORUM (April 22, 2022), https://hightechforum.org/building-a-spectrum-pipeline/.

for 5G applications, allocations are also critically needed across low- and mid- bands to achieve ubiquitous coverage outside of densely populated urban cores.

5G applications, particularly midband operations, have the promise to enable new solutions to more individuals. As discussed above, FWA to the home is the fastest growing segment of consumer broadband in the U.S.[24] The transformation seen in the viability of this technology has largely been powered by 5G over midband spectrum, but more is needed. Currently, only five percent of the lower midband is allocated for commercial wireless use.[25] Additional spectrum in 3.1 – 3.45GHz along with looking at 4 GHz, 7GHz and above, will provide the best opportunities to deploy 5G networks, fully enabling this technology's promised societal and economic benefits.

C. The Spectrum Strategy Should Also Promote Efficient Spectrum Sharing Where Technologically Feasible

Finally, it is important to note that while licensed spectrum is the backbone of the U.S. wireless economy, the industry is constantly innovating in spectrum sharing and NTIA may consider allocating spectrum to encourage this innovation when clearing is not possible. WIA encourages NTIA to explore innovative and efficient uses of this finite resource, such as the blended use of the CBRS spectrum. While the long-term efficacy of this regime is still being examined, WIA and its members have already seen successful uses of the nonpriority licenses to enable solutions from enterprise private networks to rural communities creating independent local networks.

[24] *See,* Section I, Commercial Spectrum Usage Undergirds America's Success And Requires A Dedicated Pipeline supra at 5 - 7.
[25] *Spectrum Allocation in the United States* at 34.

IV. CONCLUSION

WIA applauds NTIA for taking these important actions to develop a National Spectrum Strategy. It is of extreme importance for the U.S. to develop a comprehensive strategy, including identifying a pipeline of spectrum to be made available, to meet the expanding needs and applications of wireless technology. In developing the Strategy, WIA encourages NTIA to recognize the immense economic and social benefits commercial wireless provide and to allocate new spectrum to continue to power the industry. WIA appreciates this opportunity to provide the perspective of the wireless infrastructure industry and stands ready to work with the NTIA and other federal partners to achieve this shared goal.

Respectfully submitted,

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