

**Before the
U.S. DEPARTMENT OF COMMERCE
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
Washington, DC 20230**

In the Matter of)	
)	
Implementation of the National Spectrum)	Fed. Reg. Document No.
Strategy)	NTIA-2023-26810

COMMENTS OF VERIZON

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I. INTRODUCTION.

The National Spectrum Strategy (“Strategy”) represents an important step forward in restoring U.S. leadership in spectrum policy and ensuring that U.S. wireless networks remain the envy of the world.¹ Critical to the Strategy’s success is the Implementation Plan and the prompt, meaningful study of key mid-band spectrum for repurposing for commercial use.

The United States has steadily fallen behind peer nations and competitors, like China, that are making substantial amounts of licensed spectrum available for critical wireless operations. This is so even as American consumer and enterprise demand for wide-area commercial wireless services continues to skyrocket and U.S. investment in cutting-edge wireless networks unleashes new capabilities for innovative applications and services. While the Strategy took an important step in identifying key bands for study, today there is no pipeline for commercial licensed spectrum—in particular, key mid-band spectrum—which undercuts U.S. leadership in wireless and puts U.S. economic and national security interests at risk.

¹ See *National Spectrum Strategy*, The White House (Nov. 13, 2023), https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf (“Strategy”); see also *Implementation of the National Spectrum Strategy*, 88 Fed. Reg. 85266 (Dec. 7, 2023) (“Notice”).

The Strategy appropriately recognizes the need for a spectrum pipeline, specifically mid-band spectrum, to be made available for commercial wireless use and the importance of wireless services to consumers, the U.S. economy, and national security.² In particular, the Strategy identifies the 3.1-3.45 GHz (“lower 3 GHz”) and 7.125-8.4 GHz (“7/8 GHz”) bands for study for potential repurposing for commercial use.³ The National Telecommunications and Information Administration (“NTIA”) should take the next, critical step of setting benchmarks for the amount of spectrum to be identified in each band for licensed, full-power use.

The Presidential Memorandum accompanying the Strategy directs that the study of these bands be completed within two years,⁴ and that work—led by NTIA—must proceed quickly and effectively to enable policymakers to convert the findings into action. This rapid timeline is essential as wireless operators seek to meet the challenges presented by the significant increase in wireless network traffic and expand wireless broadband connectivity across the nation.⁵

Critically, the Strategy must identify additional spectrum to be made available for licensed wireless services at full power with rights of assured access and protection from interference, which remain foundational elements to support wide-area commercial wireless deployments. Such deployments expand connectivity, support innovation, promote broadband competition, and advance U.S. economic and national security interests. By providing certainty

² See Strategy at 3.

³ See *id.* at 3; see also *Memorandum on Modernizing United States Spectrum Policy and Establishing a National Spectrum Strategy*, The White House, at Sec. 3(c) (Nov. 13, 2023), <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/11/13/memorandum-on-modernizing-united-states-spectrum-policy-and-establishing-a-national-spectrum-strategy/> (“Presidential Memorandum”).

⁴ See Presidential Memorandum at Sec. 4.

⁵ See, e.g., Press Release, Verizon, *Data usage on Verizon’s 5G Ultra Wideband network has increased 249%* (June 1, 2022), <https://www.verizon.com/about/news/data-usage-verizon-5g-ultra-wideband-network-increased>.

in access to spectrum, the U.S. can unlock wireless broadband investment, innovation, and deployment that advance the nation’s leadership and improve the lives of Americans.

II. EXCLUSIVE-USE LICENSING REMAINS VITAL TO WIRELESS BROADBAND DEPLOYMENT.

Wide-area commercial wireless networks contribute significantly to our nation’s economy, thanks in large part to networks deployed at scale that are the foundation for wireless connectivity, innovation, and ever-growing reliance on all things wireless. Spectrum—in particular, full-power, licensed spectrum with rights of assured access and protection from interference—is the key input powering this economic success story and expanding connectivity.

U.S. wireless networks and the innovation in apps and services that our wireless networks have unleashed are an amazing American story. During the 4G decade, the wireless industry supported one out of every six American jobs, and gross output from the U.S. wireless industry topped \$9.5 trillion from 2011 to 2020.⁶ 5G is projected to create an additional 4.6 million jobs and contribute up to \$1.7 trillion to the U.S. GDP over the next decade.⁷ This economic success ties directly to wireless providers’ access to full-power, licensed spectrum.⁸

Access to licensed spectrum is also vital to America’s national security interests. As discussed previously, the United States is competing with China and other rival nations for technological superiority. U.S. and allied leadership in globally harmonized licensed spectrum

⁶ See *The 4G Decade: Quantifying the Benefits*, RECON ANALYTICS, at 3, 6 (July 29, 2020), <https://api.ctia.org/wp-content/uploads/2020/07/The-4G-Decade.pdf>; Aren Megerdichian, *The Importance of Licensed Spectrum and Wireless Telecommunications to the American Economy*, COMPASS LEXECON, at 3 (Dec. 7, 2022), <https://api.ctia.org/wp-content/uploads/-/2022/12/Compass-Lexecon-Licensed-Spectrum-Report.pdf>.

⁷ See Enrique Duarte Melo et al., *5G Promises Massive Job and GDP Growth in the US*, BOSTON CONSULTING GROUP, 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.

⁸ See Comments of Verizon, Docket No. NTIA-2023-0003, at 4-5 (filed Apr. 17, 2023) (“Verizon Strategy Comments”).

bands is directly linked to achieving both economic scale and a trusted supply chain.

Harmonizing bands for substantially similar use worldwide thus generally minimizes the threat that high-risk suppliers from foreign adversary nations can use predatory techniques to dominate strategic bands.⁹

Licensed spectrum provides certainty and reliability that are critical to investment in networks at scale, creating the infrastructure for this growth and productivity. The Presidential Memorandum recognizes this, directing NTIA to consider “exclusive licensing” among the spectrum governance models it must assess.¹⁰ To ensure investment in networks that provide nationwide connectivity, the Strategy must seek to facilitate deployment of commercial wireless networks under an exclusive licensing framework.

The Implementation Plan should prioritize clearing spectrum, as it represents an optimal route to accelerating the deployment of wireless networks. Where clearing is not possible, the Implementation Plan should encourage proven sharing methodologies that have successfully enabled wireless deployments: static models across geographies, frequencies, and time. In NTIA’s Request for Comment on the Strategy issued earlier this year, the agency offered a definition of sharing that appropriately preserved all these options for repurposing, and it recognized that effective sharing may require incumbents to vacate, compress, or repack some portion of their systems—proven sharing methods.¹¹

Sharing mechanisms that prioritize certainty and foster investment while protecting federal incumbents have effectively made spectrum available for wide-area, full power

⁹ *See id.* at 5-7, 16-19.

¹⁰ Presidential Memorandum at Sec. 3(c).

¹¹ *Development of a National Spectrum Strategy*, 88 Fed. Reg. 16244, 16246-47 (Mar. 16, 2023) (“Request”) (Pillar #1, Question 6; Pillar #1, Question 7; Pillar #3, Question 1).

commercial use while ensuring continued operations and protection of federal missions. Examples of these mechanisms include well-defined limits on commercial use of certain spectrum by geography or by time. It is crucial for NTIA to consider this gameplan. In contrast, other spectrum access models like dynamic spectrum sharing (“DSS”) are unproven—or more precisely, have proven not to serve wide-area deployments¹²—and an overreliance on such approaches risks undermining the U.S. wireless ecosystem and isolating the U.S. wireless marketplace as other, rival nations advance their technology leadership in countries with internationally aligned spectrum allocations and frameworks.

In sum, the Implementation Plan should prioritize exclusive-use opportunities that leverage relocation, repacking, or static sharing mechanisms.

III. NTIA WILL NEED TO STUDY MULTIPLE SPECTRUM BANDS SIMULTANEOUSLY TO EXPEDITE THE REALLOCATION PROCESS.

As the Administration is aware, there is no current spectrum pipeline to address the ever-growing demand for more wireless traffic or for new and innovative services and capabilities. This heightens the urgency for the rapid study of the bands identified in the Strategy. The Presidential Memorandum requires NTIA to complete near-term studies of those bands within two years,¹³ so these spectrum studies must move forward with speed and on multiple simultaneous tracks to ensure that the United States does not fall further behind peer nations.

Two candidate bands identified by the Strategy—the lower 3 GHz and 7/8 GHz bands—present the best near-term opportunities for a spectrum pipeline to facilitate licensed wireless broadband deployments. Collectively, these bands represent roughly 1,600 megahertz of

¹² As discussed more fully below, the Citizens Broadband Radio Service (“CBRS”) sharing framework, for example, is limited by technical rules that preclude wide-area deployments and inject quality of service concerns. *See, infra*, Sec. V.

¹³ Presidential Memorandum at Sec. 4.

additional spectrum that could address the nearly 1,500-megahertz mid-band spectrum deficit that is expected in the next ten years,¹⁴ helping to bolster America’s wireless networks and advance innovative, high-bandwidth, low-latency 5G—and 6G—at scale. We address each proposed band, in turn.

A. Lower 3 GHz Band.

Verizon welcomes the Strategy’s commitment that future studies of the lower 3 GHz band address “opportunities for private-sector access in the band” in addition to the potential for DSS.¹⁵ The nation needs a broad examination of the possibilities available in this band, including identifying some portion of the band for exclusive, full-powered licensing. As NTIA Administrator Davidson recently observed, NTIA plans to “re-double our efforts to make sure that we do two different things: look at spectrum sharing in the band and how we can do that, and also look at whether there’s the possibility of relocating some systems.”¹⁶ Indeed, all options should be considered, including repacking federal systems, while ensuring “Federal mission capabilities are preserved.”¹⁷ This could involve expected changes to Department of Defense (“DoD”) operations, a result that is contemplated under relevant federal law.¹⁸ In any

¹⁴ Coleman Bazelon & Paroma Sanyal, *How Much Licensed Spectrum is Needed to Meet Future Demands for Network Capacity?*, THE BRATTLE GROUP (Apr. 17, 2023), <https://api.ctia.org/wp-content/uploads/2023/04/Network-Capacity-Constraints-and-the-Need-for-Spectrum-Brattle.pdf>.

¹⁵ Strategy at 6.

¹⁶ See *Telecommunications Official Testifies at Oversight Hearing*, C-SPAN, at 33:16 (Dec. 5, 2023), <https://www.c-span.org/video/?532208-1/telecommunications-official-testifies-oversight-hearing> (Response of Alan Davidson, NTIA Administrator, to the House Energy and Commerce Committee, Subcommittee on Communications and Technology) (“Davidson Testimony”).

¹⁷ Strategy at 6.

¹⁸ See Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, § 90008(b)(1)(A), 135 Stat. 429 (2021) (discussing the study of the 3.1-3.45 GHz band for reallocation for shared federal and non-federal commercial licensed use and auction); Commercial Spectrum Enhancement Act, Pub. L. No. 108-494, § 202, 118 Stat. 3986, 3991-93 (2004) (enabling auction proceeds to be used to reimburse federal entities for eligible costs associated with spectrum reallocation, to include relocating to new frequency assignments or utilizing alternative technologies).

such scenario, the Spectrum Relocation Fund (“SRF”) is an important resource to defray costs incurred by federal incumbents to relocate or upgrade to alternative technologies and systems while providing greater certainty for federal and commercial stakeholders alike.¹⁹

Verizon firmly supports NTIA leading further studies, with DoD collaboration as needed.²⁰ As discussed in the Presidential Memorandum, NTIA is “the executive branch agency principally responsible for advising the President on telecommunications and information policies” and serves a federal spectrum management leadership role that is essential to determining and balancing diverse federal interests.²¹ NTIA should therefore maintain primary authorship of the studies as it leads the Executive Branch’s spectrum management efforts.

B. 7/8 GHz Band.

Following the Federal Communications Commission’s decision to commit all 1,200 megahertz of spectrum in the 6 GHz band to unlicensed operations, the 7/8 GHz band is left as an extremely important—and promising—candidate band for wide-area deployments—in particular, full-power, licensed spectrum with rights of assured access and protection from interference.

The Strategy calls for studies in the 7/8 GHz band “for wireless broadband use (on a licensed and/or unlicensed basis),”²² but the Administration should focus on licensed possibilities to the maximum extent possible. U.S. mid-band allocations today are skewed

¹⁹ See, e.g., *Repurposing Government Spectrum for Licensed Commercial Use: A Win-Win for Wireless Providers and Federal Agencies*, CTIA (Aug. 2020), https://api.ctia.org/wp-content/uploads/2020/08/-Win-win_8-06.pdf.

²⁰ Strategy at 6.

²¹ Presidential Memorandum at Sec. 1 (quoting 47 U.S.C. § 901(b)(6)); see also Strategy at 2 (stating NTIA is “the sole agency responsible for authorizing Federal spectrum use”).

²² Strategy at 6.

heavily against licensed wireless use: Federal users have access to 12 times more mid-band spectrum than commercial users, and unlicensed spectrum in mid-band frequencies outpaces licensed more than four-to-one.²³ Considering the urgent need for licensed spectrum to keep up with foreign rivals for global leadership in wireless, and the importance of exclusive licensing to meet demand for wireless services, it is imperative to focus on licensed access to spectrum in this band.

The results of the 2023 World Radiocommunication Conference (“WRC-23”) underscore the importance of licensing the 7/8 GHz band in the U.S. and creating a tuning range with the uppermost 700 megahertz of the 6 GHz band. Much of the rest of the world is looking to the upper 6 GHz band for licensed services. As GSMA has noted, “the 6 GHz band (6.425-7.125 GHz)—was identified for mobile in every ITU Region—EMEA [Europe, the Middle East, and Africa], the Americas and the Asia Pacific. Countries representing more than 60% of the world’s population asked to be included in the identification of this band for licensed mobile at WRC-23.”²⁴ The world is also considering the 7/8 GHz band for potential International Mobile Telecommunications (“IMT”) use at the 2027 World Radiocommunication Conference (“WRC-27”). For the United States, making licensed spectrum available in the 7/8 GHz band would position the U.S. as a leader in a licensed tuning range with potential economies of scale across both the 7/8 GHz band and the upper 6 GHz band.

With licensed access to spectrum in the 7/8 GHz band, we can simultaneously drive licensed technology development in a broader tuning range and deliver U.S. presence and

²³ See Verizon Strategy Comments at 13 (citing *Spectrum Allocation in the United States*, ACCENTURE, at 18 (Sept. 2022) (“Accenture Spectrum Report”), <https://api.ctia.org/wp-content/uploads/2022/09/Spectrum-Allocation-in-the-United-States-2022.09.pdf>).

²⁴ Paul Kirby, *U.S. Officials, Industry Welcome WRC-23 Results*, TR DAILY (Dec. 15, 2023).

technology in other nations’ licensed use of the upper 6 GHz, rather than ceding that space to rival nations’ technologies. As discussed, harmonization in spectrum policy and allocations is important both to the Administration’s economic objectives and to fostering a trusted supply chain at home and abroad and reinforcing vendor diversity through an open, interoperable, and standards-based networks.²⁵ The United States should be working to ensure a strong U.S. presence in global bands for 5G and for 6G in the future, with spectrum policy a key component within the suite of strategies to advance our nation’s economic prosperity and the National Security Strategy.²⁶

IV. GOVERNMENT-INDUSTRY COLLABORATION IS ESSENTIAL TO ACHIEVING THE GOALS OF THE STRATEGY.

The work ahead—in terms of both near-term study of specific bands and the longer-term work to identify future spectrum bands and consider spectrum access models—necessitates collaboration and transparency among government and private sector stakeholders. Here, the Implementation Plan can make significant progress.

Critically, for spectrum sharing to succeed, commercial operators must have visibility into the federal operating environment, including capabilities of federal systems (not just operating parameters). This should include information about the inputs and assumptions made in interference analyses and technical parameters of the federal operations to accurately assess the viability of varying commercial spectrum access frameworks. Through its federal spectrum management role and primary authorship of the studies, NTIA can facilitate the sharing of such information. The Implementation Plan should prioritize transparency and collaboration among the federal interests and private sector stakeholders to ensure the results of the studies are as

²⁵ Verizon Strategy Comments at 17.

²⁶ *Id.* at 7.

meaningful as possible. This transparency will drive useful and reliable results and the selection of a spectrum access model that incentivizes investment and ensures federal missions are protected. In assessing the needs of federal missions, however, NTIA should reject any proposed expansion of protections for federal incumbents to defense contractor locations, as such action creates significant uncertainty and restricts nationwide coverage.

Collaborative dialogue across industry and government should build and improve on the processes undertaken in prior spectrum analyses—in particular, in the Partnering on Advancing Trusted and Holistic Spectrum Solutions (“PATHSS”) task group evaluation of the lower 3 GHz band. Among the lessons learned from the PATHSS process is the need for a commitment to consider all options for spectrum sharing, including the potential to relocate incumbent systems and repurpose spectrum, which NTIA Administrator Davidson acknowledged in his recent remarks to Congress.²⁷ NTIA should look to bolster the ability for industry to obtain transparent access to information on federal systems through appropriate dissemination of classified, unclassified, and controlled unclassified information, while protecting sensitive incumbent information.

V. DYNAMIC SPECTRUM SHARING SHOULD BE CLEARLY DEFINED AND APPROPRIATELY SCOPED.

DSS should be studied, and Verizon is committed to engaging in good faith with NTIA and other stakeholders to explore its possibilities.²⁸ For such discussions to be meaningful, however, it is essential that NTIA define the scope of DSS for purposes of the Strategy’s evaluations, as DSS can include a multitude of potential sharing frameworks. It is likewise

²⁷ See Davidson Testimony, *supra*, n.16; see also Jimm Phillips, *House Commerce Clears 5G Sale Act; Rodgers Seeks DOD Lower 3 GHz Report Details*, COMMUNICATIONS DAILY, Vol. 43, No. 233, at 3-4 (Dec. 6, 2023).

²⁸ See Strategy at 14.

important that NTIA recognize that DSS is unproven and, as currently constructed, does not advance wide-area broadband networks. Further, this work is a longer-term initiative; NTIA should make clear that the two-year studies must address the near-term need for wide-area wireless deployments and cannot be delayed by longer-term studies of DSS.

As Verizon’s own experience with one model of DSS—the CBRS framework—has shown, dynamic sharing models are better for augmenting capacity and coverage rather than facilitating nationwide deployments at scale, given the limitations associated with channel availability and reliability. In addition to being preemptible, CBRS deployments in the Priority Access License and General Authorized Access (“GAA”) tiers are further encumbered by technical rules that limit uses to low power, which restricts deployments at scale. And service may be disrupted if the Spectrum Access System (“SAS”) or Environmental Sensing Capability network goes down or the governing SAS loses connectivity or becomes congested. These effects add unpredictability to the quality of service offered and increase costs to operators and consumers, among other issues.²⁹ As a result, Verizon and others have leveraged CBRS to augment capacity where and when it is available but are not deploying CBRS for primary coverage at scale.³⁰

As Deputy National Security Advisory Anne Neuberger correctly noted, “[t]he wireless industry has thrived due to private sector investment . . . which depends on the certainty that spectrum capacity will be available when it’s needed, free of harmful interference. Ensuring that sharing technologies provide a similar level of certainty is key, and a key requirement for the

²⁹ See Verizon Strategy Comments at 20-21.

³⁰ *Id.*

long-term viability of any dynamic spectrum sharing.”³¹ Verizon agrees. While the use of DSS should continue to be explored, it is not a panacea for the current spectrum crunch facing the wireless industry.

Finally, to study DSS, however it is defined, Verizon supports the Strategy’s commitment to use a testbed to “enable the identification, in collaboration with national policymakers, of short-term access for experimentation in Federal and non-federal spectrum segments.”³² Verizon and federal operators have used testbeds to bring secure, low-latency connectivity to support our national defense while fostering sharing arrangements with federal users.³³ Critically, technology innovations such as network slicing and virtualization, mobile edge computing, and private cellular network capabilities—coupled with the certainty and security of licensed airwaves—make such partnerships relevant for federal users.³⁴

In doing so, NTIA should consider the use of the 37 GHz band. The Strategy identifies the band for “a co-equal, shared-use framework allowing Federal and non-Federal users to deploy operations in the band.”³⁵ And the propagation characteristics lend themselves to the

³¹ *National Spectrum Strategy Rollout*, The White House, at 9:35 (Nov. 13, 2023), <https://www.youtube.com/watch?v=VeZgEWYqwu0>.

³² Strategy at 16.

³³ See, e.g., Press Release, Verizon, *U.S. Dept. of Defense awards Verizon nearly \$1 billion in new business* (Mar. 16, 2022), <https://www.verizon.com/about/news/us-dept-defense-awards-verizon-nearly-1-billion-new-business>; *5G and technological innovation help the Department of Defense explore new frontiers*, VERIZON (Sept. 2021), <https://www.govexec.com/media/how-5g-and-tech-innovations-are-helping-the-dod.pdf>; *Anatomy of a 5G Smart Base*, FEDERAL NEWS NETWORK (Sept. 2021), <https://federal-newsnetwork.com/wp-content/uploads/2021/09/Anatomy-of-a-Smart-Base-FNN-Verizon-eBook.pdf>; see also Verizon Strategy Comments at 21-22.

³⁴ See Verizon White Paper Response to Request for Information for Next Generation Electromagnetic Spectrum Strategic Roadmap, Notice ID 632369514, at 8-9 (filed Feb. 17, 2023).

³⁵ Strategy at 7.

localized nature of DSS. Verizon welcomes the opportunity to work with NTIA and other stakeholders on this initiative.

VI. CONCLUSION.

For the National Spectrum Strategy to be meaningful, it must be implemented with clear goals for identifying and making available core mid-band frequencies for licensed, full-power use to benefit our nation's economic and security objectives. And the government should commit to work collaboratively with industry stakeholders to ensure reliable and robust evaluation of the potential for commercial access to federal spectrum. Verizon looks forward to working with NTIA to ensure the Implementation Plan and the follow-on studies over the coming years achieve these important objectives.

Respectfully submitted,

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