Testimony of Chris Lewis
President and CEO, Public Knowledge

Before the
House Committee on Energy and Commerce
Subcommittee on Communications and Technology

Strengthening America's Leadership in Wireless Technology

January 23, 2025

Chairman Hudson, Ranking Member Matsui, Chairman Guthrie, Ranking Member Pallone, and members of the Communications and Technology Subcommittee: Thank you for inviting Public Knowledge here today to testify on this vitally important topic – strengthening American leadership in wireless technology. My name is Chris Lewis and I am the President and CEO of Public Knowledge. Our organization is dedicated to promoting freedom of expression, an open internet, and access to affordable communications tools and creative works.

I. Why America Leads the World in Wireless Tech, and Has for the Last 30 Years.

The major wireless innovations of the last 30 years – mobile telephony, Wi-Fi, advanced navigation systems – all began in the United States. Not only were they invented here, but they also quickly spread and created entire new sections of our economy. This is astounding, when one thinks about it. How has the United States maintained such dominance?

Three factors give the United States its unprecedented staying power as the leader in wireless. (A) Our system that manages spectrum as a ***public asset*** in the ***public interest***, while encouraging

private investment and innovation in wireless technology; (B) The willingness of the Federal Communications Commission (FCC) to experiment with new regulatory models that create new opportunities for private innovation; and (C) Our careful division of spectrum between federal and non-federal users – with the FCC as sole authority over non-federal users, but required to respect and cooperate with federal users.

Let me explain why each contributes critically to our long-standing success.

II. The Public Airwaves and Private Investment.

When widespread use of radio for communications and broadcasting began in the early 20th century, the government did little to oversee its use. We treated radio essentially as private property. This soon proved unworkable. As commercial broadcasting became both economically lucrative and politically powerful, many more people wanted to use the spectrum than the technology of the time could support.

Other governments effectively nationalized their spectrum. Only the government could operate broadcast radio or authorize new uses of spectrum. These governments acted through ministries under the direct control of the country's chief executive.

The United States went a very different way. It created an independent agency to oversee spectrum use, designed to strike the right balance between the many users of spectrum – such as public safety, local governments, and broadcasters – to encourage innovation and private

investment. Most importantly, Congress recognized that spectrum represented a unique, non-renewable public resource. It determined to protect and manage the "public airwaves" for the public interest by enshrining the following into law:

- ***No one may own the public airwaves.*** The Communications Act allows the FCC to authorize access to spectrum in a variety of ways. The most common approach is issuing licenses for exclusive use of particular frequencies in specific geographic areas. But these licenses do not convey any ownership, even if the licensee won the licenses through an auction or acquired them from others. This allows the FCC to update the rules governing the license when needed, and to revoke the licenses if the licensee fails to comply with its responsibilities.[1]

- ***Licensees must serve the public interest, not only their private interest.*** Licensees are trustees of their licenses to use the public airwaves for the benefit of their community of service – the geographic area covered by their license. In the age of broadcasting, this meant (and still means) a responsibility to provide local communities with news and information necessary for an informed democracy. In the world of mobile services, this usually means bringing service to everyone – not just the most densely populated and most profitable urban areas.

- ***Spectrum policy, including auctions, is not about raising revenue.*** Since 1993, the FCC has used auctions to distribute exclusive use spectrum licenses. The FCC uses auctions

[1] 47 U.S.C. § 304.

because auctions have proven to be the most effective way to distribute exclusive licenses. Critically, nothing about using auctions changes the fundamentals of licensing and FCC authority.[2] Auctions, and FCC spectrum policy broadly, are about efficient use of the public airwaves to benefit the public interest.

Congress made clear when it adopted auctions as a means of distribution that it intended the FCC – and licensees – to use auctions to serve the public interest rather than to maximize revenue. Congress instructed that the FCC design auctions to promote competition, to "safeguard the public interest," to promote innovation and ensure that these innovations' benefits are "readily accessible" to all Americans.[3] Revenues from auctions are not simply for the purpose of reducing deficits and funding tax cuts, but for "recovery for the public of a portion of the value of the public spectrum resource made available for commercial use."[4]

This combination of private management in the public interest, carefully overseen by an independent FCC, laid the foundation for our wireless economy and long-standing U.S. dominance of wireless innovation. The private sector, driven by profit motive, provides the capital investment. Management in the public interest ensures that these networks include all Americans.

III. Managing the Public Airwaves for Innovation.

[2] 47 U.S.C. § 309(j)(6).
[3] 47 U.S.C. § 309(j)(3)-(4).
[4] 47 U.S.C. § 309(j)(3)(C).

The United States has introduced virtually every innovation in spectrum regulation globally. When we develop innovative spectrum policy, we also create opportunities for innovation in both technology and business, including by launching entire new sectors of our economy worth billions of dollars annually. Because we lead and innovate, the rest of the world finds it easier to follow along by adopting our rules -- even when we cannot predict precisely what technological or policy change will happen next.

To take one critical, well-known example, the FCC's creation of "unlicensed spectrum" that gave birth to Wi-Fi, Bluetooth, and countless other wireless technologies. In the 1980s, the FCC became the first regulatory agency in the world to authorize "unlicensed" spectrum. This allows anyone to use any device for any purpose under rules authorized by the FCC to avoid interference with any licensed service. At the time, the FCC primarily envisioned this for garage door openers, baby monitors, and random consumer toys such as remote control cars. But by unleashing the creative power of the private sector with innovative new rules, the FCC permitted the creation of so much more.

Similarly, the FCC has innovated in the regulation of spectrum licenses. The FCC was the first regulator to allow "flexible use." Rather than assigning licenses for a specific purpose, such as broadcasting, the FCC began permitting licensees to use licenses in whatever way they saw fit – subject to the FCC's technical oversight to ensure they would not create harmful interference. The FCC became the first regulator to distribute licenses by auction, and then the first agency to use incentive auctions to persuade licensees to return unneeded spectrum to repurpose.

At the moment, the FCC continues to innovate, fostering economic growth through the creation of new technologies and new business models. The development of Citizens Broadband Radio Service (CBRS), a hybrid of licensed spectrum and unlicensed spectrum, is already generating enormous investment in private 5G and LTE networks, and acting as a critical supplement for Tribal providers and other rural ISPs. Proposed new example: The FCC recently authorized outdoor use of unlicensed in the 6 GHz band, giving outdoor stadiums and other users of Wi-Fi the ability to upgrade to Wi-Fi 6e with dramatic increase in throughput.[5]

It is critically important to remember that the wireless economy, with its countless connected devices and applications, could not have happened without the willingness of the FCC to innovate the rules and regulations governing spectrum access and use. Congress should continue to encourage this innovation if we wish to maintain our international wireless leadership.

IV. Balancing the Needs of All Federal and Commercial Stakeholders.

The importance of spectrum access has grown exponentially over time. In the past few years, we have seen upgrades to 5G and Wi-Fi 6, with 6G and Wi-Fi 7 already in development. Additionally, federal agencies – particularly the military – must keep constant pace with the evolution of wireless technology. It is far more important that our military not lose the "race with China" (or any other nation) than to worry about whether China has allocated more frequencies for 5G. First responders, medical providers, manufacturing – virtually every sector needs more access to spectrum to meet its unique needs. But few people consider the difficulty in

[5] *See* Notre Dame News, "Notre Dame Stadium Becomes First Outdoor University Venue to Move to Wi-Fi 6e Standard," (December 10, 2024).

maintaining this growth as a win-win for multiple sectors of American industry. On the one hand, spectrum sharing offers the tantalizing vision of a world without spectrum scarcity, permitting unlimited innovation. On the other hand, we rely on exclusive licensing to provide the incentive for wireless providers to build nationwide networks. Simultaneously, we must provide enough spectrum for classified military operations, sensitive weather radar, GPS, and other non-commercial uses that require exclusive use.

In addition to high-profile stakeholders, such as the wireless industry, broadcasters, and the military, the FCC has an obligation to consider the needs of countless others. This includes Tribal governments, who are typically unserved by commercial licensees and remain among the most unconnected regions in the United States. It includes non-commercial users, legacy users, and the rising demands of satellite users. It includes rural communities and those in the urban core. As the Communications Act repeatedly instructs the Commission, the FCC has a responsibility to ensure the blessings of our wireless future to ***all*** Americans.[6]

Unsurprisingly, the FCC finds itself caught between different stakeholder groups wanting very different things. Our continued leadership in wireless depends on effectively managing these often contradictory stakeholder demands.

V. Recommendations for Continued American Leadership in Wireless.

A. Stop Playing Revenue Games With Spectrum

[6] *See, e.g.,* 47 U.S.C. §§ 151, 309(j)(3)(B), 309(j)(4)(C), 1507.

The ever-increasing demand for spectrum is not the only thing that makes it difficult to maintain balance between the demands of stakeholders. The fact that auctions produce revenue warps spectrum policy. The temptation to auction spectrum solely to produce revenue creates a zero-sum game where stakeholders must fight one another rather than cooperate to develop the most beneficial spectrum policies. This is particularly true for federal users – notably the military.

The constant push to grab more and more commercially licensed spectrum from federal users has alienated federal users generally, and the Department of Defense (DoD) specifically. This, in turn, has created resistance between the DoD and the FCC, and between their committees of jurisdiction. The practical consequence of this has been a legislative and agency stalemate that has frozen the development of new spectrum for commercial purposes – on either a licensed or shared basis. The FCC auction authority expired in March 2023 and, despite the bipartisan efforts of this committee, has faced consistent opposition to renewal from those concerned that the FCC will move too aggressively to auction spectrum without concern for federal users or other stakeholders generally.

Indeed, the fact that Congress continues to put an expiration date on FCC auction authority stems entirely from the desire to keep using spectrum auction revenue as a perpetually available "pay for." Congress should stop holding sound spectrum policy hostage to the misguided belief that spectrum is a piggy bank rather than a vital public resource.

As an initial matter, Congress would do well to recall that when auctioned for exclusive use, spectrum changes from a potentially abundant reusable resource to a scarce resource that must eventually fail to support our ever growing wireless economy and cease to become a source of technological innovation. There is no such thing as spectrum mining or spectrum fracking. Once the public airwaves are divided and auctioned for exclusive use, they are gone for decades, if not longer.[7] Furthermore, predicting the actual revenue from auctions is very difficult and rarely accurate. Unsurprisingly, those advocating for auctions take an extremely optimistic view of potential revenue, frequently resulting in severe disappointment and a funding gap that only serves to increase the deficit.[8]

Finally, the cost of clearing federal users to auction spectrum continues to increase exponentially – reducing the actual revenue available for deficit reduction well below the projected gross revenues of the auction. For example, the auction of the 100 MHz of 3.45-3.55 military spectrum (over the objections of the DoD) earned $22.5 billion, but clearing federal users cost over $14 billion.[9] As federal users are increasingly forced to cram more and more functionality into less and less spectrum, the cost of federal clearance increases, creating a vicious cycle of diminishing returns.

Congress should therefore make FCC spectrum auction authority permanent. The FCC has lacked this important tool for distributing spectrum licenses for nearly two years. Had Congress

[7] It is possible to share spectrum access on an unlicensed basis with high power licenses. This "underlay" approach was the first type of unlicensed use authorized by the FCC. But exclusive licensees fiercely resist any such sharing rules.
[8] For example, some experts estimated that the broadcast incentive auction would potentially earn $100 bn. Actual gross revenues were $19.8 bn.
[9] *See generally* FCC Auction 110 webpage, https://www.fcc.gov/auction/110.

made FCC auction authority permanent at any point in the last 30 years since Congress first authorized auctions to distribute licenses, the FCC would still have this important tool available. Instead, because of the effort to use auctions to maximize pay for revenue, the future of FCC auctions – and American leadership in wireless – remains uncertain.

B. Reinvest Auction Proceeds in Communications Infrastructure

As discussed above, we use auctions to distribute high-power, exclusive use licenses for access to the public airwaves because that proved the most efficient way to do it. After decades of trying alternate methods, and relying on the economic theories of Nobel prize-winning economists such as Ronald Coase, Congress and the FCC concluded that using auctions to distribute exclusive licenses was most likely to encourage the licensees to invest in new networks and new technologies.[10] But the fact remains these are still the public airwaves, and the money should be reinvested to fulfill the purposes of the Communications Act generally and the auction statute specifically – to ensure that the benefits of wireless technology are "readily accessible to all Americans" and to "recover for the public a portion of the value of the public spectrum resource made available for private use."[11]

[10] As always, there are problems between theory and practice. Without safeguards, auctions create a concentrated wireless industry to the detriment of consumers and innovation. But the question of auctions v. other means of distribution and how to construct auctions that affirmatively promote competition and digital inclusion is beyond the scope of this testimony. *See generally*, Kathleen Burke, *Back to the Spectrum Future: The 20th Anniversary of the Spectrum Task Force*, Public Knowledge (2023). https://publicknowledge.org/policy/back-to-the-spectrum-future-the-20th-anniversary-of-the-spectrum-policy-task-force/

[11] 47 U.S.C. § 309(j)(3)(C).

Accordingly, net proceeds[12] from the auction of spectrum should not simply be used for deficit reduction or to offset general spending. Instead, the revenue should fund infrastructure development and affordability programs directly related to broadband access, or to public safety investment. In the past, Congress has mandated that auction revenues fund such communications related programs as the converter box program during the DTV transition to prevent Americans from losing free over-the-air television,[13] the construction of FirstNet,[14] and, most recently, "rip and replace."[15] In 2022, Public Knowledge, in coalition with other advocates for closing the digital divide, urged that Congress create a permanent digital equity foundation funded through spectrum auction revenue.[16]

C. Continued Regulatory Innovation

Congress should continue to support the FCC in its mission to foster technological innovation through regulatory innovation.[17] In particular, Congress should invest in the FCC's regulatory

[12] It is again worth noting that those who urge using spectrum proceeds as a pay for for tax cuts or deficit reduction generally typically cite the gross proceeds of auctions. But the net proceeds are far smaller. Under the statute, the FCC is required to retain sufficient revenue to pay the salaries, equipment cost, and other expenses associated with developing and running a spectrum auction. In the event that federal spectrum is auctioned, the auction is required to pay for relocation of federal users to new spectrum capable of supporting their previous functions. Where non-federal spectrum is reclaimed, the Commission is required to reimburse the existing licensees to relocate (on occasion, a bonus is offered to speed clearing the spectrum for the new licensees). These associated costs reduce the total net proceeds by billions of dollars.
[13] *See* Digital Transition and Public Safety Act of 2005.
[14] *See* Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112-96 § 6207.
[15] *See* Brad Randall, "Spectrum Auction to Fund 'Rip & Replace' Program," Broadband Communities (Jan 8, 2025). https://bbcmag.com/spectrum-auction-to-fund-rip-and-replace-program/
[16] *See* Airwaves For Equity Press Release (Dec. 13, 2022). https://newamericadotorg.s3.amazonaws.com/documents/Airwaves4Equity_Press_Statement_Commerce_Hearing_v4_121322_1.pdf
[17] *See* 47 U.S.C. §§ 157, 303(g), 309(j)(3)(B).

innovation supporting new forms of shared access such as CBRS, access to the broadcast bands via TV white spaces, and the use of cognitive radios and sensing technologies. As with the original development of rules for unlicensed spectrum and ultra-wide band frequency hopping, innovation in these regulatory models is spurring the development of new technologies and new business cases.

Incumbents exist to advocate existing technologies, and their advocacy inevitably boils down to "more of the same." Unfortunately, there are no lobbyists for future technologies or trade associations for businesses that do not yet exist. In the 1980s, the FCC took a risk on authorizing unlicensed spectrum access. This is why Wi-Fi and Bluetooth devices began in the United States and launched the United States to wireless prominence. In the 1990s, the FCC created spectrum auctions, which is why the United States became the leader in cell phone deployment and innovation worldwide. Continued leadership means continuing to innovate at the regulatory level.[18]

D. Careful Management of Spectrum for All Stakeholders

Finally, our continued leadership in wireless depends on careful management of spectrum that respects the needs of all stakeholders – not only the largest commercial providers with the most powerful trade associations. We have seen that when cooperation between federal users and the FCC breaks down, spectrum policy stalls and the world stops regarding us as reliable leaders.

[18] A cautionary note that "innovation" should not be mistaken for deregulation for its own sake. The success of these innovations depended on the ongoing supervision by the FCC.

We have seen that public safety and educational providers need access to spectrum, as do industries that cannot hope to spend billions of dollars in spectrum auctions.

Over the last three years, the FCC and the National Telecommunications and Information Administration (NTIA) have worked to develop interagency agreements to avoid friction between commercial and federal spectrum users, including a National Spectrum Strategy.[19] In 2023, the FCC issued a policy statement on the need for incumbents and new entrants to jointly share responsibility for reducing harmful interference in an increasingly crowded wireless world.[20] Not only are these good policies in and of themselves, but also our ability to maintain wireless leadership in the global economy depends on maintaining continuity over the long-term. Congress should encourage both the FCC and NTIA to build on existing policies of careful spectrum management and stakeholder inclusion.

CONCLUSION

To maintain U.S. leadership in wireless innovation, spectrum management must balance the needs of all stakeholders – commercial, federal, and underserved communities – while prioritizing the public interest. The FCC's role in regulating the public airwaves has fostered global leadership in technologies like Wi-Fi and 5G, but this success depends on continued regulatory innovation and careful management. Congress should avoid using spectrum auctions solely for revenue generation, instead reinvesting proceeds into broadband expansion, public

[19] *See* NTIA, Office of Spectrum Management, "National Spectrum Strategy." https://www.ntia.gov/programs-and-initiatives/national-spectrum-strategy
[20] Principles for Promoting Efficient Use of Spectrum and Opportunities for New Services, 38 FCCRcd 3682 (2023).

safety, and closing the digital divide. By promoting competition, encouraging new business models, and fostering collaboration between federal and commercial users, the U.S. can ensure ongoing wireless innovation and equitable access for all Americans, securing its position at the forefront of the global wireless economy.