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before the

United States House of Representatives

Committee on Energy and Commerce

"Strengthening American Leadership in Wireless Technology"

January 23, 2025

Introduction

Good morning, Subcommittee Chairman Hudson and Ranking Member Matsui, full Committee Chairman Guthrie and Ranking Member Pallone, and Members of the Committee. My name is Michael Powell, and I am the President and CEO of NCTA – The Internet & Television Association. Thank you for the opportunity to testify today.

NCTA is a trade association of American innovators. We represent an industry building the most powerful broadband platform in the United States as well as those companies creating video programming that entertains, informs, and inspires. Our broadband networks reach 87 percent of all U.S. homes, offering gigabit and higher speeds to millions of Americans in a highly competitive marketplace. Cable operators lead the broadband market because we have invested heavily in wireline and wireless networks—$330 billion over the last two decades and over $23 billion in 2023 alone. We serve every region of the country: rural, suburban, and urban.

Wireless technologies are central to bringing high-speed internet to our customers and have allowed us to enter the competitive mobile broadband market. As a relatively new entrant, we have quickly become the Nation's fourth largest wireless carrier. This success is a result of being innovative and flexible in our use of spectrum. We utilize a mix of unlicensed Wi-Fi spectrum, shared-licensed microcell spectrum, and exclusively licensed spectrum to offer a competitive, lower-priced choice for consumers. Our experience has taught us that an innovative market demands innovative spectrum policy.

Today I will discuss two topics. First, I want to share the great American success story of Wi-Fi (utilizing shared, unlicensed spectrum), and highlight the critical importance of continuing to invest in that technology for the benefit of consumers, entrepreneurs, and American

leadership. Second, I want to make the case that the only realistic hope for getting advanced wireless services to the market quickly and at reasonable cost demands the government lean more aggressively on using shared spectrum, rather than clinging to yesteryear's "clear 'em out and auction" exclusive-license approach.

Wi-Fi: America's Wireless Workhorse

To most people, Wi-Fi is the internet. It is like an information wall outlet we plug our devices into to check our email, watch videos, post on social media, read the news, and communicate with friends and relatives—but even better because Wi-Fi lets us get rid of the plug and go wireless. And it is ubiquitous. It is at home, at work, at the coffee shop, on planes, in stadiums, in museums, in libraries and in hospitals. It is everywhere, and we expect it to be everywhere. In my experience, the first question a house guest will ask is, "What is your Wi-Fi password?"

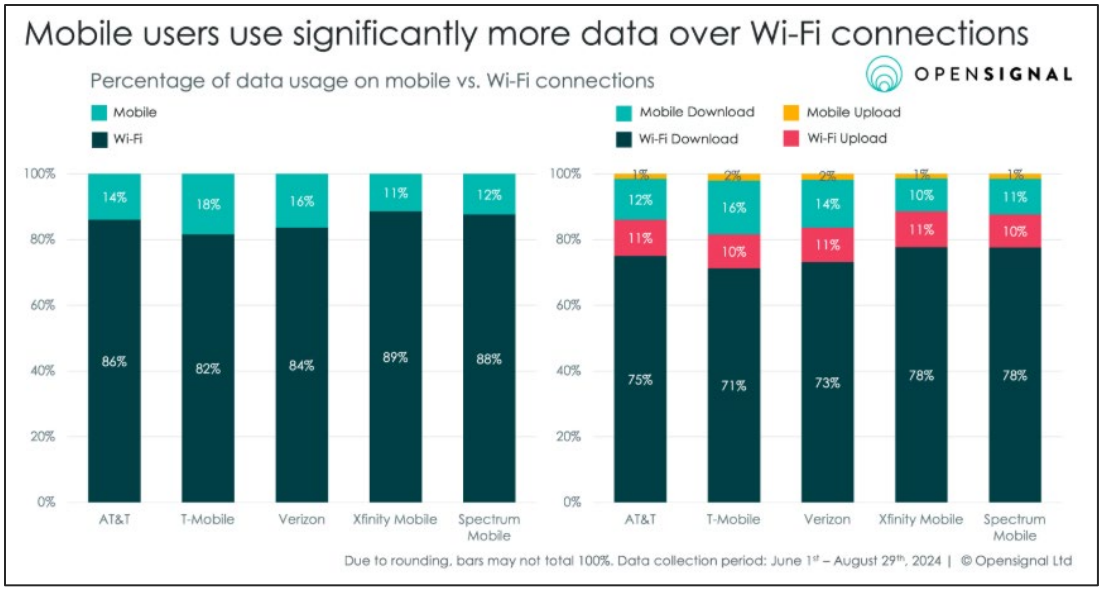
Wi-Fi lets anyone share a single fixed internet connection. In the early dial-up days, consumers would buy one internet connection that would let them connect only one computer. Wi-Fi came along and let everyone in the home get online, without paying for additional connections from your provider. That development made internet service significantly more valuable, and more affordable. And it kept your kids from fighting over the computer. It is hard to imagine how the country would have survived staying at home during the pandemic in a world before Wi-Fi.

Wi-Fi also is rocket fuel for the Internet of Things. With the rise of Wi-Fi, innovators and entrepreneurs can confidently assume that they can connect to a Wi-Fi network for free and without having to acquire a license. This has allowed a new world of *permissionless innovation*. Creative companies can suddenly turn any appliance, speaker, thermostat, camera, baby monitor,

or TV into a smart device—one that can access the internet. Our homes today have, on average, roughly 17 connected devices and are projected to have 24 by 2027.

Steve Jobs' unprecedented decision to put Wi-Fi into the iPhone in 2007 was one of the most pivotal decisions in communication's history. This transformed the phone from a device primarily designed to make calls into the most important internet access tool in the world. It opened up the app ecosystem, and everything that has sailed in its wake. If there is any doubt of the monumental significance of this unlicensed shared wireless workhorse, just look at the numbers.

- **Wi-Fi carries the world's internet data:** Ten times more data transits over Wi-Fi networks than all other wireless networks combined, including 5G networks.
- **Mobile phones are effectively Wi-Fi devices:** According to an OpenSignal study, 80-90% of data traffic on mobile phones goes over Wi-Fi. Wireless carriers depend on Wi-Fi to manage capacity on their cellular networks. Indeed, if you're indoors, you're more likely than not starting your phone call on Wi-Fi.
- **America has profited:** Wi-Fi has translated into hundreds of billions of dollars added to the U.S. economy annually—by 2027, the annual economic value of Wi-Fi is projected to reach $2.4 trillion. The U.S. decision to open the 6 GHz band to Wi-Fi is projected to generate $1.2 trillion annually by 2027, and opening the 7 GHz band is estimated to add at least $79 billion to the economy between 2025 and 2027 alone.



These extraordinary figures are not a result of luck, but instead the result of enlightened policy. The FCC first recognized in the 1980s that a band of spectrum characterized by most as "junk spectrum" held the promise of carrying data on a shared, unlicensed basis. And subsequent Commissions further embraced and advanced this forward-looking shared model. The novel approach made spectrum available to an infinite number of users at no cost and without undue regulation. The spectrum was free for consumers to use. A swarm of new devices, unimaginable at the time, flooded the market, and the torrent continues to accelerate unabated. New advanced generations of Wi-Fi, such as Wi-Fi 7 and 8, promise a whole new universe of things in the home including smart glasses, VR/AR devices, robots, and AI systems.

And the best part of the story is that Wi-Fi is an American-led innovation. Wi-Fi is based largely on American intellectual property. It employs an approach that harnesses the input and innovation of our citizens, acting freely to publish, produce, and invent. This is a stark contrast to the central command approach of autocratic societies that do not trust their own citizens, preferring to spy on them rather than empower them. On the international level, America is championing the use of Wi-Fi by other countries, to the consternation of the Chinese Government, which seeks exclusive 5G bands to drive the sale of Chinese hardware around the world, as part of its digital silk road initiative.

Wi-Fi ushered in the future, and it will remain the indispensable technology for the foreseeable future. American spectrum policy should recognize this and continue to support Wi-Fi with the spectrum it needs to continue its explosive growth and preserve the high-quality experiences consumers have come to expect. We are grateful that the FCC made additional spectrum available in the 6 GHz band, but more is needed based on rapidly rising demand and innovative new services that will rely on wider spectrum channels. We need a spectrum

roadmap that recognizes and takes account of our dependency on Wi-Fi and does not neglect it in the fervor to support the 5G cellular transition.

Shared Spectrum: The Key to 5G and Beyond

There is one simple truth that should animate any discussion about future approaches to spectrum policy. It is that while demand for spectrum is accelerating, the supply has dried up. Nearly all mid-band spectrum that carriers seek for 5G is currently being used by mission-critical government systems, most of which are with our warfighters at DOD. There seemingly is a Hobson's choice between degrading our national security capability in favor of commercial interests, or not risking harm to the national security but crippling our economic and technological superiority versus our global adversaries.

The approach we have used historically will not resolve this perennial conflict. In the past, we relied on a clear-and-auction approach. Government officials would identify bands held by government users that were underutilized or that could be relocated at reasonable cost. We would auction that spectrum to commercial interests, and the government users would be cleared from the band. The winning bidders typically would pay for the relocation costs out of the auction proceeds—assuming a suitable place to move had been found.

But today, several critical things have changed, complicating this approach. First, most spectrum incumbered by government today is being used for mission critical systems (Naval and airborne radar, space exploration, FAA air safety, etc.). The low-hanging fruit has been eaten. Second, there are fewer and fewer suitable places to move government users and greater security risks attendant to forced relocation. And third, relocation costs are skyrocketing, in many cases exceeding any reasonable expectation that an auction would produce enough money to even cover our costs. The battle between government users trying to keep control of their spectrum

versus commercial players trying to take it away is boiling over, spilling into the political arena for a resolution. This is a painful and dangerous path that pits commercial wireless against national security and leads to endless cycles of political conflict.

Even where a consensus is reached to clear national security systems from a spectrum band and offer it at auction to commercial interests, the time and cost are increasingly astronomical. These costs and delays reduce auction revenue, keep spectrum from consumers for years, and jeopardize military readiness and national security. In fact, DOD has projected that clearing just the Lower 3 GHz band for exclusive use would take 20 years and cost at least $120 billion—which is roughly 50% *more* than any exclusive-use spectrum auction has yielded in revenues. We are not going to win a race against China or anyone else if we are this slow getting spectrum to market and this weighed down by the exorbitant cost. And a series of brutal political fights will not open a smooth pipeline for future spectrum.

Shared spectrum models are the key to meeting our growing wireless needs. New advances in technology, such as dynamic spectrum management and sensing technology, have made it possible to effectively coordinate and manage a collection of different users, offering different services in the same spectrum band. If government and commercial users can share spectrum, then both sides win, and our policy leaders don't have to referee pitched spectrum battles constantly. Sharing spectrum has several exceptional advantages:

- It "expands the pie," bringing new commercial spectrum to market that otherwise would not be available for use.
- It resolves the conflict between competing federal and commercial interests.
- It allows hundreds of companies to use the spectrum, rather than just one. This increases competition and invites a wider range of diverse uses.
- It can still support the offering of 5G and 6G services from terrestrial wireless providers.

- Non-traditional providers can use spectrum to set up their own networks. Manufacturing plants can have a private network, as can hospitals, schools, farms, airports, and utility services.

- And importantly, the lower cost of entry allows wireless providers to better reach and serve rural communities.

We have had proven success with sharing spectrum. The two leading examples of shared spectrum both arose from American innovation. The first is Wi-Fi, which we all know and value. Wi-Fi operates at far lower power levels than cellular macrocells. It was designed from the beginning to share spectrum among multiple users on a non-prioritized, "listen-before-talk" basis, relying on technical rules and sensing technologies to support the shared use of frequencies.

The second innovation is the rise of shared-licensed technologies. These technologies allow spectrum to be licensed for commercial use, but require such licenses to operate under rules involving databases or sensing systems that ensure compatibility with government and defense systems. These shared-spectrum approaches make it possible for commercial operations to coexist not only with government systems, but also with other commercial operations, adding even more value.

One very successful example of shared licensing is the deployment of commercial Citizens Broadband Radio Service (CBRS) systems that harmoniously operate alongside the U.S. Navy today. The FCC's shared-licensed CBRS auction produced more auction bidders and winners than any other auction. There were 228 winning bidders—almost ten times the number of winning bidders than in the exclusive-use, cellular macrocell 3.45 GHz band auction. Today, the CBRS band is used by the big cell phone companies and by cable companies offering competitive wireless services. In addition, a host of non-traditional users are operating in the

band, including manufacturers like John Deere, airports and seaports, including the Newark Liberty Airport, educational institutions, including Sacramento City Unified School District, smart factories, stadiums, agriculture, the U.S. military, and it was even used to restore connectivity in North Carolina after Hurricane Helene. There are already more than 400,000 CBRS base station devices around the country, more base stations than in the traditional cell phone bands.

Moving Forward on Spectrum Policy

The steady growth of America's reliance on technology and the incredible new power of converged wireline and wireless have created a new spectrum era. This committee has always supported American ingenuity in meeting these needs, and the future of spectrum management is no different. In a time of spectrum scarcity, we must meet these needs while recognizing our obligation to protect critical government and national security capabilities and operations.

The answer is coexistence through spectrum sharing. Wi-Fi and shared-licensed technologies can operate successfully and efficiently in the same band as other commercial or national security operations without causing harmful interference, all without requiring lengthy and costly relocations. That's revolutionary, and it opens a path to a sustainable and scalable spectrum pipeline. Without embracing shared spectrum, we risk slower deployment of critical technologies like 5G and 6G, undermining our global leadership. And if we fail to act now, the U.S. risks falling behind not only in economic growth, but also in national security and technological innovation.

It goes without saying that any auction needs an auctioneer. NCTA supports the extension of the FCC's auction authority, so that it has all the tools necessary to ensure that new spectrum is made available. At the same time, however, we urge Congress not to favor exclusive

license auctions over shared-license auctions and unlicensed Wi-Fi designations. Instead, as the country explores opening mid-band spectrum, we should be sure to study a shared-license auction in the Lower 3 GHz band and Wi-Fi in the 7 GHz band and, in general, establish policies that allow the country to harness these two technologies to find win-win solutions in future bands.

Conclusion

Thank you again for inviting me here to speak with you today. Spectrum is at the center of NCTA's members' efforts to bring the best broadband to the country. Our businesses have adapted to massive changes in the wireless environment and are therefore investing in Wi-Fi and 5G shared-spectrum technologies, alongside traditional cellular networks. We encourage Congress to do the same to ensure that the U.S. industry and military continue to lead the world in the wireless space.