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Introduction

Good morning, Chairman Latta, Ranking Member Matsui, and Members of the Subcommittee. My name is James Assey, and I am the Executive Vice President of NCTA – the Internet and Television Association. Thank you for the opportunity to testify today on the important topic of defending America's wireless leadership.

NCTA is the principal trade association for the U.S. cable industry, representing cable operators serving approximately 90 percent of the nation's cable television households and more than 200 cable program networks with a rich history of creating award-winning programming. The cable industry is also a leading provider of broadband service. Over the past 10 years, cable companies have invested more than $172 billion in fiber-rich broadband deployment and upgrades, including in low-income, rural, and remote areas. Fast and affordable broadband networks have made America a leader in today's digital economy, and cable operators are proud to support this critical mission.

As consumer connectivity demands have grown, the cable industry has evolved to meet them, beginning with always-on broadband in the 1990s to today's multigigabit, 10G technology. In order to meet consumer needs for ubiquitous broadband over a myriad of devices, cable companies have increasingly invested in wireless connectivity to expand the reach and capabilities of their broadband networks. Most recently, some of our members have begun to offer mobile wireless service to their customers.

NCTA welcomes this important hearing on spectrum policy, as the Subcommittee reviews the future needs of both the public and private sectors and determines how best to meet these diverse needs, while continuing to drive wireless competition across the country. Of particular importance, I appreciate the opportunity to discuss the virtues of a balanced spectrum

policy that includes shared-licensed and unlicensed spectrum as well as exclusive licenses, to best promote economic growth, competition, and innovation in wireless services.

Cable Companies Have Made Investments to Become Important Providers of Wireless Services

NCTA's members have a deep interest in spectrum policy because they provide wireless connectivity and services in meeting the needs of their customers. For more than 10 years, Comcast, Charter, and Cox have provided their broadband customers with CableWiFi® service over a wireless network of millions WiFi hotspots across the nation. Smaller cable providers like Midco have likewise invested in fixed wireless solutions to extend broadband service to places where traditional network buildouts are costly, like farms that are often miles apart from each other.

Beginning in 2015, cable companies began offering mobile wireless service. Today, Comcast and Charter are the fastest growing retail wireless companies in the marketplace, each with over five million mobile subscribers and growing faster than the incumbent mobile wireless providers. And Cox Communications announced the national launch of its mobile service in January of this year. Cable companies offer consumers another choice for mobile services at competitive prices.

Critically, cable's wireless offerings integrate licensed 5G and unlicensed WiFi networks to deliver robust high-capacity service. Charter's Wi-Fi network, as an example, carries 450 million IP devices and 85 percent of the mobile traffic consumed on Spectrum Mobile phones. Likewise, more than 80 percent of traffic from Xfinity Mobile phones is carried on Wi-Fi. And our members continue to invest in their wireless businesses. In the Federal Communications Commission's 2020 auction for licenses in the Commercial Broadband Radio Service ("CBRS"), Charter, Comcast, and Cox were three of the top five winning bidders, respectively spending

$464 million, $458 million, and $212 million to acquire 210, 830, and 212 licenses that will help enable them to meet the growing demand for wireless connectivity.

Technological Innovation, Competition, and Forward Planning on Spectrum Policy Will Continue to be Essential

The need for new spectrum continues unabated, driven by innovative applications like the Internet of Things, robotics, and virtual and augmented reality technology. These applications not only require the broadband connectivity provided by cable networks but will unquestionably require policymakers to find new ways to make more of the radio spectrum available to support these uses. Access to spectrum is essential to cable's ability to compete and continue to innovate, and indeed for any small, rural, or non-traditional wireless provider to be able to develop and deliver new connectivity services to meet the data, automation, and industrial needs of the future.

The FCC's Communications Marketplace Report notes that AT&T, T-Mobile, and Verizon Wireless, together held approximately 78% of all the spectrum included in the Commission's spectrum screen, measured on a MHz-POPs basis. Making more spectrum available is essential to introducing more competition into the wireless marketplace. Spectrum is also increasingly critical for private networks, which are being used to for industrial automation, artificial intelligence, and predictive maintenance, in environments ranging from warehouses, ports, factories, airports, and office buildings, in rural as well as densely populated areas, supporting supply chain efficiency.

Fortunately, Congress and the relevant regulatory bodies have long recognized that a spectrum "pipeline" can assist with forward planning as technology and consumer demand changes. Regularly for the past 30 years, Congress has enacted legislation encouraging expert agencies to identify and study federal government spectrum that could be reallocated to support

commercial uses. Within the federal government, the responsibility for identifying new bands for this purpose falls to the FCC and NTIA, and the NTIA Act specifically requires the Assistant Secretary for Communications and Information and the Chair of the FCC to meet, at least biannually, to conduct joint spectrum planning. Last August, mindful of the need to work together to ensure that spectrum policy decisions promote efficient use of the spectrum by all users, NTIA and the FCC updated their memorandum of understanding regarding spectrum planning. And earlier this year, NTIA Administrator Davidson announced that NTIA will be working with other agencies to develop a National Spectrum Strategy to ensure the U.S. maintains its leadership in spectrum-based services by developing a long-term plan to meet both commercial and federal spectrum needs.

NTIA has also taken on the important task of diversifying the number of wireless network equipment suppliers through Open Radio Access Network (O-RAN) technologies and the Public Wireless Supply Chain Innovation Fund, a goal that NCTA supports. O-RAN will improve the efficiency of the spectrum allocated to commercial use by enabling interoperation between cellular network equipment provided by different vendors. Interoperability will also encourage a more diverse equipment ecosystem, thereby helping improve the security of our wireless networks.

The cable industry is actively engaged in the efforts to develop these technologies. CableLabs, the industry's R&D consortium, was recently selected by NTIA to host an industry-based 5G Challenge event established to measure the compliance of O-RAN vendors with O-RAN standards. In order to meet tomorrow's spectrum needs, allocating additional spectrum must go hand-in-hand with advancing the technology that can make the most of the spectrum resource.

NCTA strongly supports maintaining and enhancing the processes for identifying additional commercial spectrum and developing new strategies to promote greater efficiency and more intensive use of spectrum. There will also continue to be a strong public and consumer interest in the efficient use of spectrum to serve governmental or *non-commercial* interests. The federal government uses spectrum for national defense, weather observation, law enforcement, and more. As such, a successful spectrum policy must balance the future needs of commercial wireless services against future government needs for spectrum. The cooperative shared-spectrum model embodied in the FCC's CBRS rules offers a compelling framework for developing win-win solutions in other spectrum bands that strikes this balance.

A Balanced Spectrum Policy Best Promotes Innovation and Competition

NCTA members use exclusive-licensed, shared-licensed, and unlicensed spectrum to expand the reach of their broadband networks and provide mobile services. Successful spectrum policy must ensure the U.S. supports each of these approaches to meet the needs of the American consumer and drive competition. You are probably most familiar with exclusive licensing of spectrum, which the FCC generally awards through spectrum auctions. Exclusively-licensed spectrum is largely held by the largest, traditional wireless carriers. There are two other approaches that are key to sound spectrum policymaking.

Shared-Licensed Spectrum. Shared-licensed spectrum is a new, innovative way to enable commercial use in federal spectrum bands without incurring the cost or disruption of moving incumbent government users to a different frequency band. Shared-licensing has been implemented in the FCC's framework for Commercial Broadband Radio Service ("CBRS") in the spectrum band between 3.55-3.7GHz. Under the three-tiered CBRS access and authorization framework, federal users were not required to relocate from the band, but instead retain priority

access to the spectrum they need, while non-federal users are awarded individual licenses ("PALs") by auction as well as "licensed by rule" ("GAA") access. PALs and GAA licenses enjoy varying levels of interference protection, with commercial use managed through dynamic sharing on an opportunistic basis by Spectrum Access System administrators.

Cable companies were major participants in the auction of CBRS licenses, but auction winners also included a broad range of diverse bidders including traditional wireless carriers, utilities, and manufacturers, demonstrating the value and utility of shared-licensed spectrum. The auction overall was a success, raising $4.6 billion from 228 diverse winning bidders–almost 10 times the number of winning bidders in the exclusive-use 3.45 GHz band auction. The lower power operations in this band facilitate sharing between commercial operators and federal users, creating an incredibly efficient use of valuable spectrum resources, while expanding 5G services to more consumers across the country.

CBRS is now being used throughout the country, with over 285,000 CBRS base station devices already deployed. A wide array of entities, including school districts, cities, sports stadiums, warehouse complexes, healthcare providers, and the military, now utilize the CBRS band to obtain 5G capability and performance. The FCC has certified 187 different CBRS base station models and 496 different end user client devices, ranging from traditional smartphones and IoT modules and gateways to security cameras, barcode scanners, and building management sensors.

The OnGo Alliance, an industry organization that supports the development, commercialization, and adoption of shared spectrum solutions like CBRS, estimates that the CBRS band alone will directly contribute as much as $15.6 billion to the U.S. economy while unlocking tens of billions of dollars more in value to consumers. CBRS is particularly

compelling for many enterprise use cases because CBRS provides the flexibility to choose from the broadest range of technologies and service models – driving innovation and competition in the private wireless market. For example, John Deere uses CBRS in its factories to analyze data on welding patterns to train an algorithm on the best welds for future fabrications, and to track equipment location and utilization in the factory to improve operational efficiency. The Port of Long Beach uses private networks to support automated-guided vehicles moving cargo and to improve real-time logistics through faster wireless communications, such as push-to-talk radios. Attached to my testimony is a letter from a wide array of companies who are already utilizing CBRS and who offer further evidence on the value of the shared-licensed spectrum framework.

The FCC conceived of the CBRS shared-licensed model to allow the DoD to avoid band clearing (and its associated costs and time) and continue its critical operations while also allowing a wide variety of commercial operators to use spectrum in the same band. This tiered spectrum sharing model ensures the protection of America's national security interests while allowing other users to make the most of a critical resource. CBRS can serve as a model for unlocking other government-held spectrum for commercial use in a timely fashion to a wide ecosystem of users, as I've described above, without compromising the ongoing spectrum needs of DoD and other government users.

As directed by Congress in the Bipartisan Infrastructure Act, DoD is conducting research and development – with input from commercial stakeholders – into making the 3.1 GHz band available for commercial purposes. NCTA and its members participate in the Partnering to Advance Trusted and Holistic Spectrum Solutions (PATHSS) Task Group, which is a collaboration between DoD and NTIA to work with the FCC and all interested industry stakeholders to analyze how this valuable spectrum can be made available for commercial use

while protecting the critical military operations currently using this spectrum. The 3.1 GHz band represents a key swath of mid-band spectrum critical for the deployment of 5G and other innovative services.

As demonstrated by the CBRS experience, we believe a shared spectrum approach presents a unique opportunity to answer some of the most challenging questions about how to both repurpose the band for more efficient uses while at the same time protecting critically important activities by the Department and other federal agencies. The Lower 37 GHz band and the 12.7-13.25 GHz band hold similar potential for a simple sharing framework that would permit multiple new mobile and fixed operators to share spectrum with federal operators and commercial incumbents. The CBRS experience is already demonstrating that the shared spectrum framework is an ideal mechanism for unlocking new government spectrum for commercial use, meeting growing consumer and business demands, while at the same time fostering innovation, driving down costs, and increasing competition in the wireless marketplace.

Unlicensed Spectrum. Unlicensed spectrum—the wireless building block that is available to all—is behind many of the technologies that American consumers and businesses use and rely on every day. Unlicensed spectrum technologies contribute hundreds of billions of dollars to the U.S. economy annually - $995 billion in 2021, according to the WiFi Alliance. In the MOBILE NOW Act, Congress itself recognized the importance of unlicensed spectrum, establishing as the "policy of the United States . . . to promote spectrum policy that makes available on an unlicensed basis radio frequency bands to address consumer demand for unlicensed wireless broadband operations."

The development of cutting-edge technologies like Wi-Fi, Bluetooth, mobile payment solutions, and more, has generated significant benefits to end users and driven enormous global

economic value. For example, the Wi-Fi Alliance estimates that the global value of Wi-Fi will reach nearly $5 trillion by 2025. Similarly, a report by the Consumer Technology Association in February 2022 estimated that Wi-Fi and other unlicensed wireless technologies together annually generate $95.8 billion in incremental economic sales annually. As the FCC has explained, "[u]nlicensed devices that employ Wi-Fi and other unlicensed standards have become indispensable for providing low-cost wireless connectivity in countless products used by American consumers."

For many, Wi-Fi is synonymous with internet access, and for good reason: More than 80% of data traffic consumed on mobile phones goes over Wi-Fi, and an increasing majority of all global internet traffic. Across Comcast households, for example, nearly a billion devices connected to Wi-Fi in 2021, representing a 12X increase since 2018. Wi-Fi also directly benefits cellular network operators by enabling them to offload mobile data traffic from wireless devices to Wi-Fi networks. In fact, industry studies show that more than half of cellular data is offloaded to Wi-Fi networks. The arguments that the incumbent wireless industry is making with regard to the value and viability of shared licensed allocations are similar to the assertions against unlicensed use, but today unlicensed is a key economic driver providing benefits to consumers as well to the wireless industry for offloading.

The FCC's recent decision to make spectrum in the 6 GHz band available for unlicensed sharing with incumbents demonstrates that new commercial capacity can be created without displacing incumbents. The 7 GHz band is the next critical opportunity to keep pace with the ever-growing demand for unlicensed spectrum by enabling Wi-Fi 7, the next generation Wi-Fi that will support broader channels of spectrum to enable greater capacity and multi-Gigabit speeds. And like the 6 GHz band, 7 GHz can be commercialized without displacing existing

federal and non-federal users, enabling the most efficient use of existing spectrum and avoiding the significant cost associated with moving incumbents.

Exclusive Licensing Through Auctions Is Only One Model for Spectrum Allocation

The goal of defending America's wireless leadership is best served by a robust, "all of the above" spectrum policy that recognizes the economic, commercial, and consumer benefits of shared-licensed and unlicensed frameworks. Exclusive licensing is also part of spectrum policy, but it should not be the sole focus of that policy. 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 to remove the implicit bias toward exclusive auctions that is reflected in budget scoring rules that over-indexes the value of auction receipts over the economic value and competition created by spectrum that is made available through the auctioned shared-licensed framework as well by unlicensed use.

Attaching extremely high auction revenue estimates to spectrum auctions without accounting for the cost-savings and economic benefits of shared-licensed and unlicensed spectrum risks forcing the Commission to conduct auctions based on exclusive licensing spectrum. While a successful spectrum policy will include the use of exclusive licensing, flexible, light-touch unlicensed uses as well as tiered sharing frameworks like those used in the CBRS are essential components of a well-rounded spectrum policy. By contrast, an all-or-nothing reliance on exclusive licensing will limit opportunities for commercial use, skew spectrum policy in favor of incumbents, and impede the innovation, competition, and economic growth made possible by unlicensed and shared-licensed spectrum. Striking the right balance has the power to unleash tools that will enable new entrants to build increasingly efficient ways to connect consumers, lower costs, and promote competition in the wireless marketplace.

Conclusion

Thank you again for inviting me here to speak with you today. NCTA's members welcome this hearing and are committed to working with you to achieve a spectrum policy that will fuel competition in the wireless marketplace and promote the public interest. Championing unlicensed and shared spectrum regimes in a balanced approach will ensure that the United States continues to lead the world in the wireless space.