

**U.S. FEDERAL COMMUNICATIONS COMMISSION
CONTRIBUTION TO GSR-21 CONSULTATION:
“Regulatory Uplift for Financing Digital Infrastructure, Access and Use”**

The United States Federal Communications Commission is pleased to participate in the 2021 Global Symposium for Regulators (GSR) consultation and offers this case study as an example of topic 3, *transformational leadership to unleash the power of emerging technologies and business models*. We believe this example can suggest certain overarching principles which may serve broadly as a useful reference for others, and which we proffer in conclusion.

INTRODUCTION

Both in the United States and globally, the demand for wireless broadband service continues to grow, with a large proportion of mobile traffic data delivered on an unlicensed basis through devices using Wi-Fi, Bluetooth and similar protocols. The coronavirus pandemic has only amplified this trend, increasing the reliance on Internet connectivity and data intensive applications, requiring high capacity Wi-Fi connectivity, regardless of where we are, for all aspects of daily life, including remote access to education and healthcare.

The U.S. Federal Communications Commission (FCC) aims to facilitate an enabling regulatory environment that benefits consumers, bolsters competition, and allows industry-driven innovation to thrive. To [support 5G development and deployment](#) and [bridge the digital divide](#), the FCC has taken a multifaceted approach to freeing up additional spectrum in the low, mid, and high bands for a variety of business plans. To successfully meet the need for additional network capacity while facing finite spectrum resources, the FCC has also sought to enable more efficient spectrum usage, balancing both licensed and unlicensed uses.

In particular, [the FCC adopted new rules for the 6 GHz band](#), making 1,200 megahertz of spectrum available for unlicensed use. Unlicensed devices that employ Wi-Fi and other unlicensed standards have become indispensable for providing low-cost wireless connectivity in countless products used by consumers. By expanding unlicensed broadband into the 6 GHz band, the FCC created an opportunity for innovators to provide new and advanced services, such as the next generation of Wi-Fi (*i.e.*, “Wi-Fi 6”), while also ensuring that licensed incumbent operations in the band continue to flourish. The 6 GHz spectrum also will complement spectrum where Wi-Fi is presently deployed to ease any existing and anticipated congestion so that businesses and consumers can take advantage of new data intensive applications.

UNLICENSED USE IN THE 6 GHZ BAND

In October 2018, the FCC began a [public consultation](#) to explore how best to provide new opportunities for unlicensed use in the 6 GHz band (5.925-7.125 GHz) while safeguarding licensed services currently operating in the band. The proceeding attracted the participation of more than 150 diverse stakeholders, highlighting active industry engagement throughout the policymaking process.

In April 2020, after extensively evaluating all of the comments filed in the proceeding and other relevant considerations, the FCC authorized two types of unlicensed operations in the 6 GHz band – standard power or indoor low power. Devices communicate using power levels that depend on the type of access point to which they are connected – either the standard-power or the indoor low-power access point.

- *Standard-power:* The FCC permitted indoor or outdoor standard-power unlicensed operations in 850 megahertz of the 6 GHz band (5.925-6.425 GHz and 6.525-6.875 GHz). It adopted power levels and other technical rules generally consistent with existing rules for unlicensed portions of the nearby 5 GHz band, allowing synergistic use of both the 5 GHz and 6 GHz bands to promote unlicensed broadband deployment. These access points can be deployed anywhere as part of hotspot networks, rural broadband initiatives, or network capacity upgrades. To protect incumbent users from harmful interference, the FCC only allows unlicensed devices to operate at these power levels through the use of an Automated Frequency Coordination (AFC) system.
- *Indoor low-power:* The FCC also opened the entire 6 GHz band – a massive 1,200-megahertz test bed for innovation – for unlicensed use. This action increased the amount of mid-band spectrum available for Wi-Fi by a factor of three and allows unlicensed operations to use up to 320-megahertz channels to expand capacity and performance capabilities. These access points will be ideal for connecting consumer electronics in homes and businesses, such as smartphones, tablets, laptops, and Internet of Things (IoT) devices, to the Internet. To prevent interference to licensed services without the need for AFC-controlled access, the FCC established several restrictions so that devices are limited to indoor operation, required to use a contention-based¹ protocol, and subject to low-power operation.

The FCC designed these new rules in order to meet the much-needed capacity demands of the wireless industry and promote innovation and investment in new wireless unlicensed technologies. As a result, industry players have been proactive in developing standards for more efficient protocols that can be used in the 6 GHz band. Notably, the FCC’s actions are helping usher in Wi-Fi 6 (*i.e.*, IEEE 802.11ax), which will be over two-and-a-half times faster than the current Wi-Fi standard, with better performance for connected devices. Likewise, in tandem with industry-led standards that will enable unlicensed 5G networks (*e.g.*, 5G NR-U), the FCC’s unlicensed spectrum rules will also likely play a major role in the growth of IoT, connecting appliances, machines, meters, wearables, and other devices, as well as industrial sensors for manufacturing.

At the same time, in carefully crafting its rules, the FCC also prioritized protection of licensed incumbent operations. Microwave services in the 6 GHz band, for example, remain critical to supporting utilities, public safety, and wireless backhaul in the United States. By requiring the use of AFC systems, which only allow new standard-power operations in areas that will not cause interference to incumbents, and by placing conservative power limits on low-power indoor

¹ A contention-based protocol allows multiple users to share the same spectrum by defining the events that must occur when two or more transmitters attempt to access the same channel at the same time, and establishes rules by which a transmitter provides reasonable opportunities for other transmitters to operate. See 47 CFR § 15.403.

operations, the FCC has taken steps to ensure the continued reliability of these important incumbent services.

To further harness the opportunities of unlicensed use in the 6 GHz band, the FCC continues to consider possibilities for very low power devices, which could enable a new and innovative generation of personal area network technologies with low latency, high capacity, and all-day battery life. The FCC has proposed to permit very low power devices to operate across the 6 GHz band to support high data rate applications including high-performance, wearable, augmented-reality, and virtual-reality devices.

CONCLUSION

The FCC closely follows market developments and industry trends and makes data-driven decisions to identify timely opportunities to incentivize innovation and investment. In the 6 GHz band, the FCC followed an open and transparent rulemaking process with the participation of more than 150 diverse stakeholders, ensuring active industry engagement throughout the policymaking process to better meet the needs of the marketplace. The FCC also evaluated the need for additional network capacity for various services with the aim to increase spectrum efficiency and balance the needs of incumbents and newcomers for the ultimate benefit of consumers.

Unlicensed devices that employ Wi-Fi and other unlicensed standards have become indispensable for providing low-cost wireless connectivity in countless products used by consumers in the United States. As has occurred in the case of Wi-Fi in the 2.4 GHz and 5 GHz bands, the United States expects that 6 GHz unlicensed devices will become a part of most peoples' everyday lives. In making broad swaths of the 6 GHz spectrum available for unlicensed use, the FCC has laid the groundwork for innovative technologies and services that will deliver new devices and applications and advance the U.S. goal of making broadband connectivity available to all the people of the United States, especially in rural and underserved areas.

The FCC commends all ITU Member States that have taken action to address the needs of both consumers and industry by applying the principles identified below for exercising transformational leadership to unleash the power of emerging technologies and business models, and welcomes continued cooperation to promote economies of scale and expand the benefits of ICTs to users worldwide.

Principles for exercising transformational leadership to unleash the power of emerging technologies and business models:

- Regulators are encouraged to follow national and global market developments and industry trends and make data-driven decisions to identify opportunities for spectrum-based services to incentivize innovation and investments in next generation services.
- Regulators are encouraged to take action to meet needs for additional network capacity with the aim to increase spectrum access and efficiency and balance the needs of incumbents, users, and newcomers with new technologies.

- Regulators are encouraged to employ transparent decision-making processes that announce plans and proposed actions and rules in advance and consult all relevant stakeholders providing an opportunity for them to comment on the potential impact of the proposals, and to publish all such comments received.